Indian Point Energy Center: Effects of the Implementation of Closed-Cycle Cooling on New York Emissions and Reliability

CO_2, SO_2 and NO_X emissions and reliability considerations under different IPEC outage scenarios and New York electric power sector input assumptions, for the period 2015-2025

Prepared for Riverkeeper

Prepared for Filing with the New York State Department of Environmental Conservation in the Matter of a Renewal and Modification of a State Pollutant Discharge Elimination System ("SPDES") Permit by Entergy Nuclear Indian Point 2, LLC and Entergy Nuclear Indian Point 3, LLC, Permittee (DEC # 3-5522-0011/00004/ SPDES # NY-0004472)

February 28, 2014

AUTHORS

Bob Fagan, Tommy Vitolo, PhD, Patrick Luckow

Synapse Energy Economics, Inc.

485 Massachusetts Avenue, Suite 2
Cambridge, Massachusetts 02139

617.661.3248 | www.synapse-energy.com

CONTENTS

1. INTRODUCTION AND SUMMARY FINDINGS

1.1. Introduction

Background

The cooling water intake structures associated with the generation of electricity at the Indian Point Energy Center (IPEC) are subject to regulation by the New York Department of Environmental Conservation (NYSDEC) pursuant to Section 316(b) of the federal Clean Water Act (CWA) and 6 NYCRR § 704.5 via the State Pollutant Discharge Elimination System (SPDES) permit program. IPEC also requires a water quality certification (WQC) from NYSDEC pursuant to Section 401 of the CWA and 6 NYCRR § 608.9 in connection with the renewal of IPEC's Nuclear Regulatory Commission (NRC) operating licenses.

As pertinent to this report, NYSDEC issued a Draft SPDES permit renewal for IPEC on November 12, 2003, which required IPEC to reduce its cooling water intake capacity in order to minimize the entrainment of aquatic organisms and determined that closed cycle cooling represented the best technology available (BTA) to achieve the required reductions in entrainment and thereby minimize adverse environmental impacts associated with IPEC's cooling water withdrawals. Pending the construction of closed cycle cooling, the Draft SPDES also required interim compliance schedule measures which included the imposition of interim fish protection outages. NYSDEC has also since provided an offer of proof dated November 12, 2013 which addressed permanent outages (i.e., "Fish Protection Outage Days" or "protective outages") as a BTA alternative.[1]

In connection with the SPDES permit proceeding and CWA § 401 WQC proceeding, this report addresses the question of whether any adverse environmental effects in terms of air pollution from New York State electric power sector emissions and/or electric system reliability impacts may be associated with the NYSDEC's final closed-cycle cooling BTA alternative. That is, this report analyzes emissions and reliability impacts in relation to closed cycle cooling construction-related outages. The report includes assessment of emission and reliability effects if IPEC was fully out of service, a "bookend" analytical case. This report addresses electric power sector emissions effects and reliability impacts for anticipated IPEC closed cycle cooling construction outage scenarios, and focuses on assessing different system effects under different outage scenarios.

Energy owns and operates two pressurized water reactors (PWR), units 2 and 3 of the Indian Point Energy Center. Unit 1, the first reactor operated at Indian Point was retired from service in 1974. Unit 2

[1] NY DEC Department Staff Offer of Proof on Permanent Forced Outages/Seasonal Protective Outages, November 12, 2013. It is anticipated that seasonal fish protection outages may be required during periods which would include May through August of each year, a time period which also coincides with the period when electric demand reaches its annual peak in the New York and surrounding regions, usually occurring within the narrower window of July/August.

(1,024.5 MW, summer rated capacity) and unit 3 (1,044.2 MW, summer rated capacity)[2] have been operating since 1974 and 1976, respectively.

The electrical output from IPEC is directly interconnected to the New York electric power system, controlled by the New York Independent System Operator (NYISO, or NY ISO). The New York electric power system is directly and synchronously[3] interconnected to the New England, PJM, and Ontario electric power grid, and directly (though asynchronously)[4] to the Quebec power grid. Direct physical transfer of electric power occurs regularly among these larger entities, backed by financial arrangements between suppliers and customers in the region. Generally, electricity among these regions is physically shared according to the laws of physics and the fundamentals of electric power economics as they apply within and across the regions.

When any given unit is out of service, the rest of the generating supply resources on the grid respond and provide replacement power, generally according to short-run economic signals and in observance of the physical constraints across the grid, such as limited transmission transfer paths. At any given time, there is a single unit or a set of units that is "on the margin," i.e. being the resource that increases output or decreases output as demand increases or decreases. Over longer time periods, generating resources are constructed, generating resources are retired, transmission infrastructure is replenished (and often increased) and the mix of resources (and/or the fuel used by those resources) serving load gradually changes.

In the near term, if or when one or both IPEC units are out of service for any reason, replacement power is sourced from the aggregate of units available in New York and in the region according to short-run economics and transmission system transfer limitations. In the longer term, replacement power for an IPEC closed cycle cooling construction outage scenario will come from the collective set of existing and new resources connected to the grid, and will reflect any changes in ultimate demand that may occur due to changes in energy efficiency and/or demand response capability. In this report, we look at the interplay between requirements to reliably supply the region's load, and the set of power plants available to provide that supply. That interplay—which we model as electric power dispatch—leads to electric power sector output emissions. We also review the reliability implications associated with potential IPEC outages by examining NYISO reliability studies and recent New York State Public Service Commission (NYSPSC) inquiries into contingency plans for reliability in the event of IPEC retirement and potential transmission infrastructure investment to increase New York State's transmission capability.

---

[2] NY ISO 2013 Gold Book, page 30.

[3] Synchronous interconnection essentially means all electrical generators in the defined region are in electrical synchronicity with each other; practically speaking, this means their operations must be coordinated by central controllers (such as the New York Independent System Operator, or NY ISO) to ensure a balance of power flow around the regions such that frequency and voltage are kept within defined ranges to ensure reliability, and transmission limits are respected.

[4] Quebec's interconnections with neighboring regions are through DC interties. This allows for more direct and scheduled control of power flows between its region and its trading partners compared to "free flowing ties" that accompany synchronously-interconnected systems.

We assess how replacement assets planned or considered would impact system emissions and system reliability under differeing IPEC closed cycle cooling construction outage scenarios.

Scope of Work

Riverkeeper engaged Synapse to conduct an electric power sector modeling analysis of the New York and adjoining electric power regions. This analysis focused on determining electric power output (MWh) and emissions (for CO_2, SO_x, and NO_x) that result under different closed cycle cooling construction scenarios where one or both units at IPEC are out of service for different periods of time. Synapse conducted this analysis for annual periods between 2015 and 2025, using the Ventyx PROSYM modeling tool, which was licensed for this specific analytical project. The PROSYM modeling tool allows unit-specific output and emissions to be determined for a given set of inputs, and those units are contained within specific zonal areas of New York and adjoining areas. Input assumptions can vary significantly in these types of analyses, and modeling multiple scenarios allows the user to gauge differential impacts for different closed cycle cooling construction scenarios tested. This report explains the rationale behind the assumption sets used, especially for load, energy efficiency, demand response, supply-side resources, and transmission topology, for each of the years modeled.

Synapse was also charged with conducting a review of the reliability circumstances that would surround IPEC closed cycle cooling construction outage scenarios. Synapse reviewed various New York Independent System Operator (NYISO) reports, NY PSC Orders and Rulings, New York utility filings, and related material to assess the status of reliability in the region in scenarios where one or both of the IPEC units were out of service for different periods of time for closed cycle cooling construction or even fully out of service in the alternative event of permanent closure. This assessment was limited to review of materials available primarily through the NYSPSC and the NYISO. In particular, the NYISO's 2012 Reliability Needs Assessment (RNA)[5] and the filings and orders in the NY PSC dockets on both the IPEC contingency plan and AC transmission upgrades informed our assessment.

Synapse's scope of work also includes appearing at the NYSDEC's SPDES and CWA § 401 WQC joint proceeding hearings and presenting expert testimony based on the analysis and findings in this emissions and reliability report.

1.2. Summary Findings

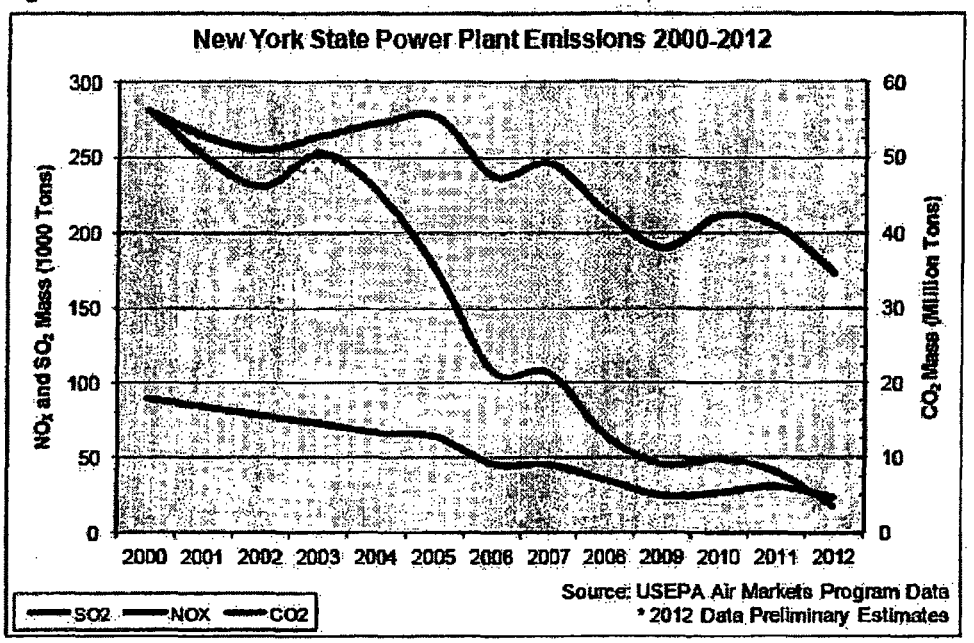
This section summarizes our emissions modeling and reliability assessment results.

[5] As noted in this report, the 2012 RNA predates the reliability contingency planning and transmission reinforcement planning work undertaken in the NYS PSC dockets. While the 2012 RNA informed out assessment, its sensitivity assessment of reliability in the absence of Indian Point was based on power flow model runs whose inputs are now in need of updating. To some extent, information filed by ConEd and NYPA in the reliability contingency planning docket at the NYS PSC addressed these issues.

Emissions Modeling

New York State has seen its electric power sector emissions decline considerably over the past decade. Electricity production from coal and oil-fired generation has declined, gas-fired generation has increased, efficiency of production has increased, and load increases have been mitigated by increasing levels of energy efficiency and the effects of economic recession. Figure 1 below, taken from a recent NYISO presentation, shows this decline.

Figure 1. New York State Electric Power Sector Emission Trends, 2000-2012



Source: NYISO presentation, "Environmental Regulations Set to Arrive," Peter Carney, Project Manager, Environmental Studies, New York Independent System Operator, NYSRC Installed Capacity Subcommittee, June 5, 2013. Available at http://www.nysrc.org/pdf/MeetingMaterial/ICSMeetingMaterial/ICS_Agenda148/Env%20impacts%205_%205_%202013%20final.pdf.

Synapse modeled future electric power sector emissions under 10 different scenarios of varying IPEC output and varying assumption sets for other key factors that influence emission levels. The next section of this report contains detailed information on this modeling process, which used the PROSYM production cost model, and the assumptions used. A high-level summary of our results is provided below.

Figures 2, 3, and 4 on the following pages show the projected pattern of carbon dioxide (CO_2), sulfur dioxide (SO_2), and Nitrogen Oxide (NO_X) emissions in New York State between 2015-2025 for the 10 scenarios analyzed.

The figures illustrate that even though a range of potential emission patterns from New York State electric generation exists over the period 2015-2025, the overall declining trend for NO_X and SO_2 emissions will likely continue, particularly with various scenarios where Indian Point is out of service for

a closed cycle cooling retrofit or even in the event of permanent retirement. CO_2 emissions as modeled exhibit a flatter trend in the out years of our analysis (that is, post-2019), though we have not analyzed all reasonable longer-term resource scenarios, which could lead to ongoing CO_2 emission declines.

Figure 2 reflects anticipated CO_2 emissions under the scenarios analyzed, and contains a reference line indicating roughly what the New York State Regional Greenhouse Gas Initiative (RGGI) cap and trade budget will be for carbon dioxide emissions. As seen, the IPEC in-service "base line" emission level tracks, but is above, the RGGI benchmark levels.[6] With increases in energy efficiency up to New York State's 15x15 target[7], the CO_2 emission are significantly lower, reflecting the compounding beneficial effects of energy efficiency installations. For a closed cycle cooling construction outage scenario with increases in energy efficiency, wind and solar photo voltaic (PV) (scenario 34), the CO_2 emission levels remain roughly on track with the RGGI benchmark levels. As expected, CO_2 emissions would be highest if no increases (beyond the baseline) in energy efficiency or deployment of renewable resources were seen, and IPEC was fully out-of-service for the entire time 2016-2025 timeframe (scenario 11). Also as expected, and as seen in our bookend scenario (scenario 41), the lowest level of CO_2 emissions was seen with incremental levels of energy efficiency, wind, solar PV, and IPEC in service.

Figure 3 shows the continuing decline in SO_2 emissions as coal and oil use for electric power generation continues to decline in New York. For a few scenarios of increased energy efficiency, high wind, and high solar PV installations, we assumed additional retirement of low-use coal-fired generation in New York. In these instances, SO_2 emission levels drop even further than the trends seen in the other scenarios.

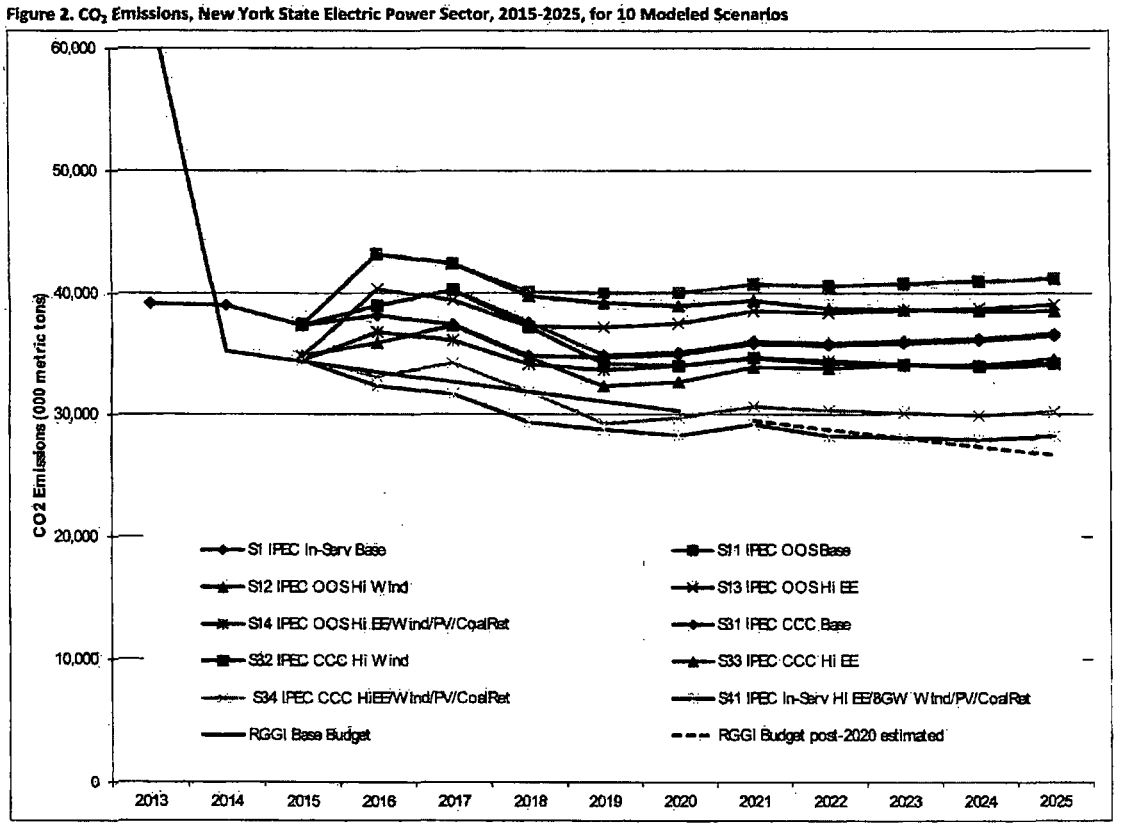
Figure 4 shows the pattern of NO_X emissions in New York State. NO_X emissions decline as the share of energy from older gas-fired resources is replaced with energy from newer, lower-emitting combined cycle generation, from the new Champlain Hudson Power Express (presumed in service in 2018 in all scenarios), and from wind, solar, and energy efficiency resources in all scenarios—and NO_X emissions are even lower in the high energy efficiency, high wind, and high PV scenarios.

In all cases, transmission system improvements help improve the overall efficiency of the power system in New York State by allowing less expensive and, in many instances, lower-emitting resources (e.g., upstate wind power) to flow more easily (i.e., with reduced patterns of congestion).

[6] The benchmark level included in this graph is the base budget for the adjusted RGGI CO_2 budget. New York Department of Environmental Conservation, State Environmental Quality Review Findings Statement, November 25, 2013, pages 1-2.

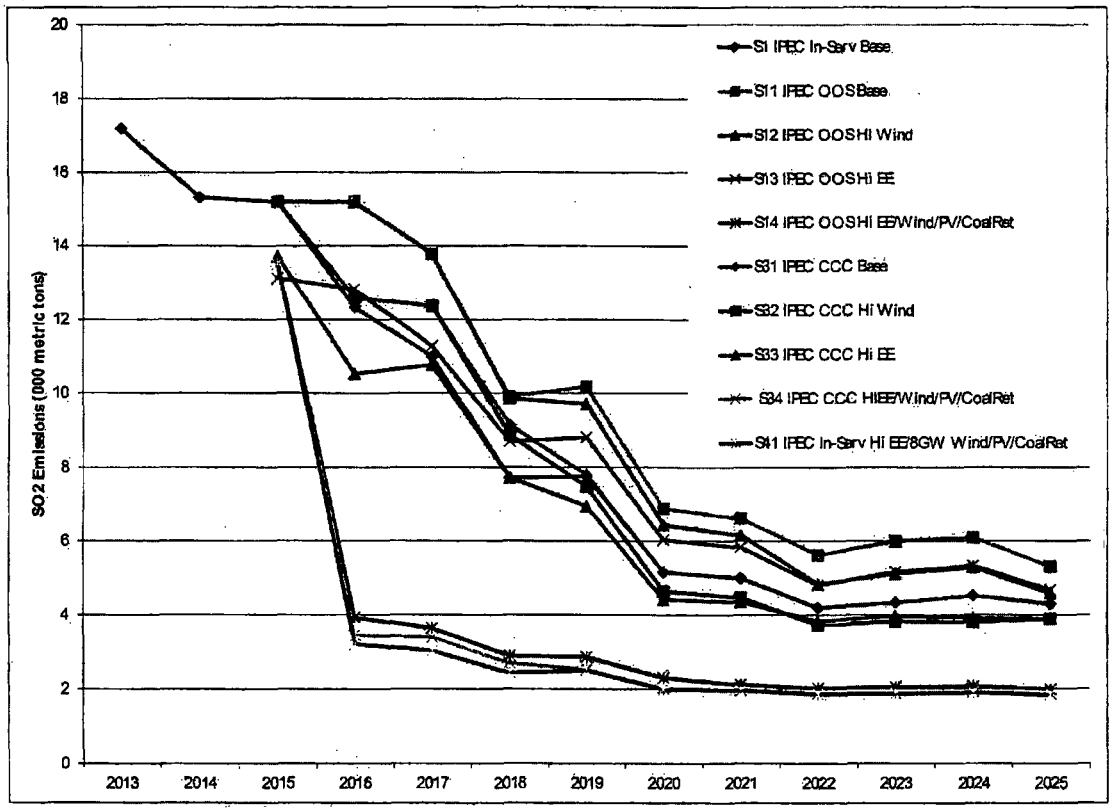
[7] New York State's energy efficiency policy aims to achieve a 15 percent reduction in consumption by 2015 (2007 baseline).

Figure 2. CO_2 Emissions, New York State Electric Power Sector, 2015-2025, for 10 Modeled Scenarios



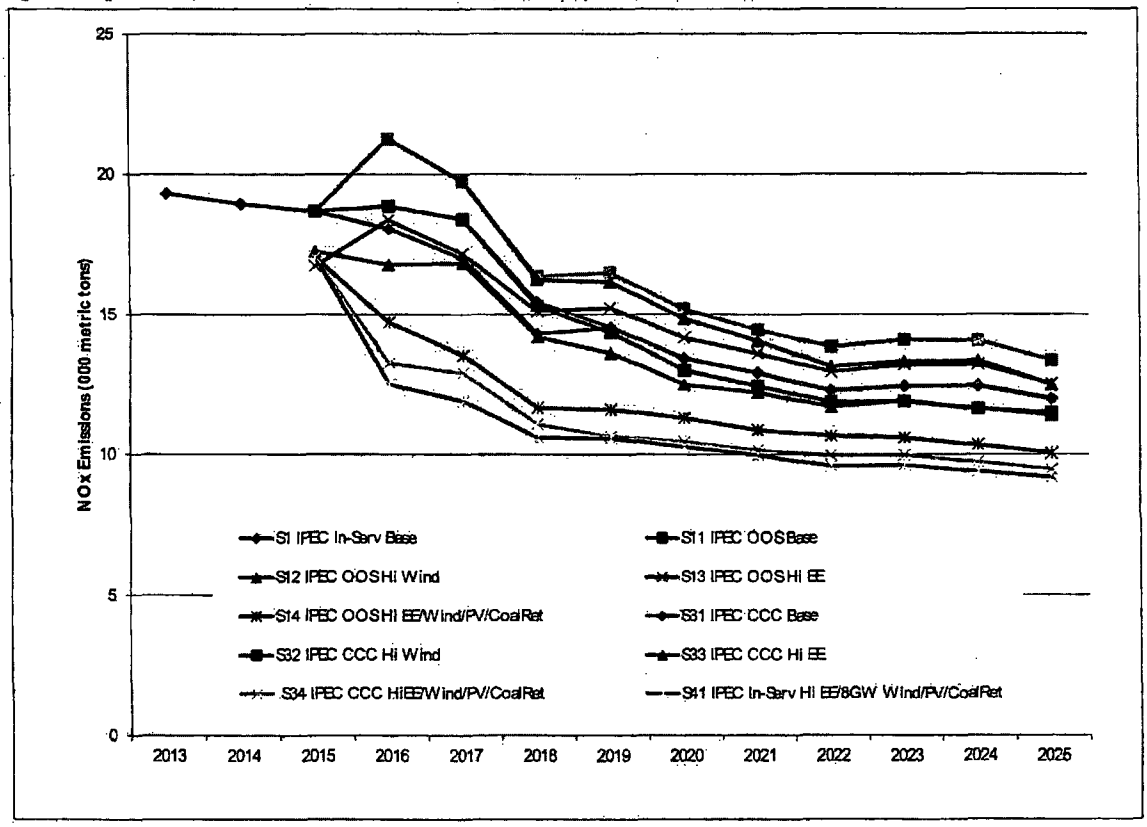
Source: Synapse PROSYM Modeling Analysis, 2014.

Figure 3. SO_2 Emissions, New York State Electric Power Sector, 2015-2025, for 10 Modeled Scenarios



Source: Synapse PROSYM Modeling Analysis, 2014.

Figure 4. NO_x Emissions, New York State Electric Power Sector, 2015-2025, for 10 Modeled Scenarios



Source: Synapse PROSYM Modeling Analysis, 2014.

We also estimated specific sources of "replacement power" for the IPEC outages, using a comparison between resource output during an IPEC in-service modeling scenario ("base" case scenario 1) and an examination of four other IPEC outage scenarios: two scenarios under which closed cycle cooling construction and installation occurs in two sequential years and IPEC is back online for the remaining years (scenarios 31 and 34, Table 1 below),[8] and two scenarios in which both IPEC units are fully out-of-service for all modeled years (scenarios 11 and 14, Table 2).[9] This comparative exercise allowed us to estimate replacement sources under different assumption sets. Notably, as seen in the results shown in these two tables, magnitude, location, and type of replacement resources vary considerably depending on the assumptions used for energy efficiency, wind, and solar PV installations.

It is important to note that, while we are aware that parasitic losses and thermal efficiency degradation will result from closed cycle cooling construction and installation, our focus was on system-wide trends, and the magnitude of such losses tends to be within forecast variation for net load, which range from the hundreds of MW (peak) into the 1,000s of MW (peak) for any given year for New York State load.[10] Thus for modeling purposes it was appropriate to ignore these effects on IPEC output.

---

[8] As fully explained in the next section of this report, in the analysis of these analytic scenarios, we assumed a 60-day interim mitigation outage in 2016 for both units, a 60-day mitigation outage for unit 2 in 2017, and full-year construction outages (unit 3 in 2017, and unit 2 in 2018) for the IPEC units over the 2016-2018 time period. That assumption set leads to IPEC output reductions of 2.2 TWh (2016), 8.9 TWh (2017), and 7.3 TWh (2018). In both scenarios, both units are presumed back in service at full output in 2019 and beyond, the same as assumed in the base scenario 1.

While Synapse is aware that interim mitigation measures will be the subject of a different, later phase of the Indian Point hearing process, Synapse incorporated the 60-day outage assumption in order to reflect and model a more realistic and conservative scenario. Synapse is further aware that there will be a range of interim outage scenarios which may be longer or shorter than Synapse's 60-day assumption. We address the ramifications of the chosen assumption and the interpretation of the 2016 modeling output at appropriate places in the report. In addition, we note that Synapse will be providing a separate emissions and reliability analysis to specifically address interim and permanent fish protection outages in connection with the next phase of the hearings in this case, which will address a wider range of fish protection outage assumptions.

[9] Counsel for Riverkeeper has informed Synapse that Riverkeeper's position is that scenarios relating to shutdown of the facility in connection with NYSDEC April 2, 2010 Denial of Entergy's requested Clean Water Act Section 401 water quality certification is properly the subject of review under the National Environmental Policy Act (NEPA) in connection with the Entergy NRC license renewal proceeding rather than under the NYSDEC SEQRA review process. The consideration of fully out of service scenarios was, thus, considered only for analytical purposes and for the sake of completeness and generating a conservative analysis. That is, Synapse made this assumption as an analytical means to assess a "bookend" scenario.

[10] NY ISO 2013 "Gold Book", Table I-1, "NYCA Energy and Demand Forecasts with Statewide Energy Efficiency Impacts."

Table 1. Replacement Power Source Shares – Closed Cycle Cooling Construction Outage Scenarios 31 (Base EE[11], Wind, PV) and 34 (High EE[12], Wind, PV)

	Base EE, Wind, PV - Scen. 31			High EE, Wind, PV - Scen. 34		
	2016	2017	2018	2016	2017	2018
Imports (QB, Ont, NE, PJM)	31%	34%	25%	-56%	11%	-5%
Gas – J	20%	18%	23%	-46%	0%	-11%
Gas – F	15%	20%	25%	-26%	8%	-1%
Gas - GHI	17%	8%	18%	4%	4%	6%
Gas - CDE	5%	7%	5%	0%	4%	1%
Coal	3%	4%	8%	-204%	-46%	-38%
Gas – K	3%	4%	2%	-27%	-3%	-8%
Gas - AB	1%	2%	1%	3%	2%	1%
Wind				0%	0%	16%
EE				388%	100%	118%
PV				64%	21%	32%
Other	4%	1%	-7%	0%	0%	-10%
	100%	100%	100%	100%	100%	100%
Replacement TWh:	2.2	8.9	7.3	2.2	8.9	7.3

Source: Synapse PROSYM Modeling Analysis, 2014.

The left-hand side of Table 1 (scenario 31) indicates 2016-2018 replacement power is sourced primarily from a mix of imports and gas-fired resources in different locations, when no accommodation is made for potential increases in energy efficiency, wind, or solar resources above a base level of deployment. Increased imports from Quebec, Ontario, New England, and PJM comprise 31% of the 2016 replacement power, rising to 34% in 2017 and declining to 25% in 2018. New York City zone J[13] gas-fired resources make up the next largest share of replacement resources: 20% in 2016, and 23% by 2018. Remaining upstate zones (A through F) and downstate, lower Hudson Valley zones (G, H, and I) make up the remaining sources. For the near term, we have conservatively assumed that no additional wind resources (beyond those already assumed in-service through 2018) will be available through 2018 and, thus, they don't serve as replacement power resources in this comparison. As we will show, this is not

[11] "Base EE" is the baseline NYISO 2013 Gold Book peak load and energy forecast, and includes some amount of projected energy efficiency effects arising from New York utility's energy efficiency programs.
[12] "High EE" is the forecast that aligns with projections for peak load and energy consumption in 2015 that reflect the targets of New York's 15x15 energy efficiency portfolio standard (EEPS) policy.
[13] See Figure 5a for a representation of zones in New York. Zones AB are western NY; CDE are central/northern NY; F is the Capital region; GHI is lower Hudson Valley; J is New York City; and K is Long Island.

the case for later years (including the near-term year 2018) when replacement power effects with increased wind installations (relative to the base scenario 1) are examined.

The right-hand side of Table 1 (scenario 34) illustrates the effect that higher levels of energy efficiency, wind, and solar PV resources have on projected replacement power resources over time. The tables indicate that the presence of increased levels of energy efficiency, increased wind installations (in upstate zones), and increased solar PV installations (throughout New York State) significantly reduce the requirements for using fossil-fueled resources as replacement power relative to scenarios where deployment of incremental amounts of these resources is not assumed.

Energy efficiency effects dominate the statewide level of replacement power resources in 2016, and those resources in turn lead to declining amounts of fossil fuel use in all but zones A, B and G,H, I, relative to the baseline scenario, which does not contain this level of modeled energy efficiency. Under the analyzed scenario in which IPEC full unit outages are underway for closed cycle cooling installation in 2017 for Unit 3 and in 2018 for Unit 2, the replacement power amounts are larger, and energy efficiency's share declines; incremental gas usage is called for in all but zones J and K, and coal use is less than in the baseline scenario. In 2018, gas usage in downstate zones, coal usage, and imports are all lower than in the baseline scenario, and incremental wind power installations begin to impact the replacement power sources.

Table 2 below shows the replacement power resource shares in 2016, 2019, and 2025 for two analyzed scenarios in which both Indian Point units are fully out of service (scenarios 11 and 14). These results show the pattern of replacement resource need in the event that IPEC Units 2 and 3 are both fully out of service in each or any of these three given years, under base levels of energy efficiency, wind and PV installations (scenario 11) and under high levels of EE, wind and PV (scenario 14).

Table 2. Replacement Power Source Shares – IPEC Out-of-Service Scenarios 11 (Base) and 14 (High EE, Wind, PV)

	Base EE, Wind, PV - Scen. 11			High EE, Wind, PV - Scen. 14		
	2016	2019	2025	2016	2019	2025
Imports (QB, Ont, NE, PJM)	36%	24%	25%	25%	7%	-5%
Gas – J	18%	22%	26%	9%	6%	-8%
Gas – F	16%	25%	19%	13%	10%	-3%
Gas – GHI	7%	13%	16%	6%	8%	-1%
Gas – CDE	6%	5%	3%	6%	3%	-1%
Coal	6%	6%	3%	-29%	-18%	-10%
Gas – K	5%	2%	4%	2%	-3%	-3%
Gas – AB	2%	1%	0%	2%	1%	0%
Wind	0%	0%	0%	0%	15%	59%
EE				58%	53%	42%
PV				9%	18%	30%
Other	3%	2%	2%	0%	0%	0%
	100%	100%	100%	100%	100%	100%
Replacement TWh:	15.7	15.6	15.5	15.6	15.6	15.6

Source: Synapse PROSYM Modeling Analysis, 2014.

Scenario 11 gives no accommodation to increased levels of energy efficiency, wind, or solar PV resources. Thus, the only difference between scenario 11 and the base case scenario 1 is that IPEC is presumed fully out of service beginning in 2016. Imports, followed by New York City (Zone J) and then lower Hudson Valley (Zone GHI) and upstate (Zone A through F) and Long Island (Zone K) gas resources, make up the replacement power, along with upstate coal resources.

Scenario 14 shows the effect of higher levels of energy efficiency, wind, and solar PV on replacement resource shares over time. Notably, the deployment of these resources dramatically lessens the overall dependency on fossil fuel use, with fossil fuel use in all zones lower than (or equal to in zones A and B) that seen in the base scenario by 2025, and only marginally higher than the base scenario by 2019 (e.g., zone F gas use is higher in 2019 but just 10% of replacement power; zone J gas use is only 6% of replacement power in 2019; and gas use in zones G, H, I is 8% of replacement power).

Reliability Assessment

The New York electric power system can be operated reliably even in the absence of both of the Indian Point Energy Center units as of 2016 as long as 1) a number of anticipated electric system infrastructure improvements are completed across different parts of the New York electric power system, and 2) anticipated generation supply increases from either new merchant plants or existing resources

(currently mothballed or requiring repair) come online. None of these improvements are located at the IPEC site. Completion of these improvements is currently planned or anticipated by June 1, 2016. The improvements need to be in place prior to the summer season following any IPEC outage, which is when New York sees its highest peak electrical load. Notably, under any scenario where at least one of the IPEC units remains available in the summer of 2016, reliable operation is also assured, since the reserve margin available to the New York system would be higher than with both units out of service.

These infrastructure improvements include new transmission system capacity known as the TOTS—Transmission Owner Transmission Solution–projects, new or returning-to-service generation capacity, and demand-side measures (energy efficiency, demand response, and combined heat and power (CHP) resources) that will lower the peak load seen on the Con Edison transmission system.[14] In combination, this portfolio of measures mitigates the reliability impacts that would otherwise be seen with the loss of such a significant amount of capacity as is represented by the Indian Point nuclear power plants. The combined effect of these projects is to relieve reliability concerns by some combination of increasing capacity resources, reducing load, or allowing existing capacity resources to be better utilized through the presence of additional transmission system infrastructure.

The NYS PSC Order accepting the IPEC Reliability Contingency Plan describes the impact of the improvements on the reliability of the system. A total capacity deficiency of up to 1,450 MW would exist on the New York system in 2016 with both IPEC units out of service if no improvements were made.[15] The Order approves the deployment of 185 MW of demand-side measures[16]—energy efficiency, demand response, and CHP measures—which lowers the need to roughly 1,265 MW. The NY PSC anticipates that the effect of the TOTS transmission improvements—also now approved by the Commission—will reduce the need by another 600 MW[17]. This rough estimate is validated by examination of materials provided by the New York utilities in the TOTS and AC transmission proceeding, and by New York transmission utilities response to the Energy Highway blueprint.[18] This lowers the original 1,450 MW need to roughly 665 MW.

Wholesale market supply resources are available to make up the remainder of reliability needs that exist after the implementation of transmission and demand-side measures. For example, the NY PSC Order notes the presence of 1,500 MW of existing merchant generation in the region that has been mothballed or is awaiting improved economic conditions or requires repair before a return to service.

---

[14] NYS PSC Order Accepting IPEC Reliability Contingency Plans, Establishing Cost Allocation and Recovery, and Denying Requests for Rehearing.

[15] While the IPEC units total roughly 2,069 MW (NY ISO 2013 Gold Book summer capability, page 30), sufficient reserve margin exists such that the IPEC units' capacity would not have to be fully replaced to ensure reliability in 2016.

[16] NYS PSC Order Accepting IPEC Reliability Contingency Plans, Establishing Cost Allocation and Recovery, and Denying Requests for Rehearing, at page 7 and 47.

[17] Id., at page 6.

[18] New York Transco, The Response to the New York State Energy Highway Request for Information, May 30, 2012, page 6. Available at http://www.nytransco.com/pdf/NYTO-Response-to-NY-Energy-Highway.pdf.

The NYISO testimony in September 2013 notes the presence of 1,900 MW of new resources in the generation interconnection queue with a commercial operation date in time for the summer of 2016.[19] The NYISO also explicitly noted the 552 MW of "mothballed" Astoria units, which are part of the 1,500 MW noted by the NY PSC. The planned implementation of a "new capacity zone" in the NYISO's installed capacity market for the Lower Hudson Valley is projected by the NYISO to increase the capacity revenues that would be available to resources locating in any of New York zones G, H, I or J.[20] These are the zones requiring the incremental capacity needed to ensure reliability, as indicated by the NYISO in the 2012 Reliability Need Assessment (RNA).[21]

Over the longer term, additional transmission system improvements under consideration by the NY PSC include reinforcement of other electrical paths in the Hudson River corridor. Those reinforcements, anticipated to be installed over the period 2018-2019, will allow increased transfer of upstate New York capacity to the downstate load centers. Additional merchant projects such as the anticipated 1,000 MW Champlain Hudson Power Express will also bolster downstate capacity and improve reliability.[22]

2. PRODUCTION COST AND EMISSIONS ANALYSIS

2.1. Overview

Synapse conducted a production cost analysis of the New York State electric power system over the period 2015–2025 to gauge CO_2, SO_2, and NO_x emissions from New York State fossil fuel generation under different scenarios of resource development and load for different patterns of IPEC availability. The primary purpose of this analysis was to develop a reasonable range of projected statewide (and zonal-based, reflecting the model's locational granularity) emissions under different IPEC outage scenarios. In particular, we analyzed scenarios in which Indian Point Units 2 and 3 are each sequentially offline for one year periods for the construction of closed cycle cooling, and scenarios in which both Indian Point units are offline concurrently each year from 2015-2025. These latter scenarios conservatively encompass any circumstance in which closed cycle cooling construction outages occur for

[19] NY ISO Vice President Thomas Rumsey, September 30, 2013 testimony before the New York Senate and Telecommunications committee.

[20] Presentations by the NYISO, New Capacity Zone Impact Analysis, January 30, 2013 and NCZ, Additional Impact Analysis, March 28, 2013.

[21] New York Independent System Operator, 2012 Reliability Needs Assessment, Final Report, September 18, 2012. Page 42. Available at http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2012_RNA_Final_Report_9-18-12_PDF.pdf. The next RNA will be undertaken in 2014.

[22] The Champlain Hudson Power Express, a 1,000 MW transmission line interconnecting in Zone J (in Queens) is estimated to be in service by the beginning of 2018. We have assumed its deployment in all of our scenarios.

both units during any given year within the analyzed range. In this report we have examined emissions impacts from these such scenarios for representative years 2016, 2019, and 2025.

The analysis we conducted also allowed us to estimate the type, magnitude, and location of "replacement power" resources, effectively answering the question of where replacement power would come from if the IPEC units were out of service.

Critically, future patterns of load, energy efficiency deployment, and renewable resource development are uncertain but have material effects on emissions. Also, transmission path reinforcement and the associated increases in power flow limits affect statewide emissions—and especially any need for incremental downstate fossil-fired generation—by allowing increased transfer of energy from upstate to downstate. Based on current New York State policies and activities prescribing transmission reinforcement, we modeled planned improvements in critical transmission paths in our emissions analysis for all scenarios. We used two sets of loading assumptions—the 2013 Gold Book[23] baseline scenario and the New York State 15x15 energy efficiency scenario[24]—across our 14 scenarios. We used two different wind resource development assumptions: a baseline installation reflecting roughly 3.2 GW (3,174 MW) of installed wind across New York by 2025, and a scenario with roughly 6.2 GW (6,166 MW) of onshore wind. We used one scenario that tested up to 8 GW of wind (including offshore) to establish a relative lower bound or bookend on total emissions. We used the same set of fossil-fired additions in all scenarios, and we accelerated some coal unit retirement in the scenarios with increased levels of energy efficiency and wind. These assumptions are described in the following section.

PROSYM Production Cost Modeling

The Ventyx Market Analytics PROSYM model simulates the operation of the electric power system with a high degree of spatial and temporal resolution. It is an hourly dispatch model, with economic unit commitment and respective of zone-to-zone transmission path constraints. Appendix B contains descriptive detail of the PROSYM model. The model is an accepted and reliable tool of the scientific/energy economist community, and we note that the U.S. Environmental Protection Agency includes PROSYM among the models it considers available for quantifying air pollutant greenhouse gas (GHG) emission effects for clean energy initiatives.[25] We use the model to forecast the change in generation and emissions resulting from outages or removal of the IPEC units. The results will be dependent on a number of scenario assumptions outlined below, particularly assumptions related to load forecasts, unit additions, unit retirements, and transmission changes. There is some uncertainty as

---

[23] NY ISO 2013 Load & Capacity Data, "Gold Book".

[24] The 15x15 scenario envisions a 15% reduction in energy consumption by 2015 relative to 2007 baseline consumption. See e.g., New York Public Service Commission, Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs, June 23, 2008.

[25] See, for example, an EPA background paper *Assessing the Multiple Benefits of Clean Energy*, Chapter 4.2.2, "Quantifying Air and GHG Emission Reductions from Clean Energy Measures." Table 4.2.4 (page 1) lists PROSYM among the "sophisticated" modeling tools available to gauge greenhouse gas emission effects from clean energy resources. Available at http://www.epa.gov/statelocalclimate/documents/pdf/background_paper_1-30-2012.pdf.

to how these changes could affect absolute levels of emissions or generation (in tons or MWh). We present "replacement resource" results as differentials (from a base scenario) rather than absolutes, as we are most interested in the change in these parameters resulting from outages (or in the extreme, permanent retirement) of the IPEC units, rather than the absolute value (though model results contain the absolute values).

We executed PROSYM model runs for the years 2015 through 2025 for 10 resource scenarios. We generally present the PROSYM results on an annual basis, though we list monthly price patterns and the model allows for extraction of data on a monthly or even an hourly basis. As will be seen in the following subsections explaining the basis for the assumptions we use, we relied upon NYISO 2013 Gold Book data, NYISO interconnection queue information, projections of potential wind capabilities per the NYISO "Growing Wind" wind generation study, and NYISO and NY PSC information on transmission. Gas price data used in the PROSYM model are reflective of the U.S. Energy Information Administration Annual Energy Outlook (AEO) price forecasts for gas in 2012 and estimated basis differentials (on a unit-specific basis) for delivery costs of natural gas to each unit. While near-term fluctuations in price are expected, current price estimates for natural gas in 2015 and beyond (the years we modeled) are similar to those-years' estimates from 2012.

2.2. Modeling Assumptions

Scenarios

Synapse defined 10 scenarios[26] to test the range of replacement power and emissions impacts that would arise under different input assumptions for an IPEC outage and for conditions around the state in the event of an outage. Table 3 contains the defined scenarios, including the key differences in variables for each of the assumptions.

[26] Synapse has executed more than 10 scenarios as part of our modeling process and has presented the results of 10 scenarios in this report as representative examples that provide a bounding and conservative analysis. Certain runs are also undertaken to initialize the model. This is part of the reason the scenario numbering system may seem to be somewhat random, or even confusing.

Table 3. PROSYM Scenarios Modeled

Scen. #	IPEC Status*	Load	Wind Additions	Coal Retirements	PV Additions	IPEC outage period
1	In-Serv	Base	Base (Low - 3GW)	Base	Base	Refueling only
31	2 Seq. Years	Base	Base (Low - 3GW)	Base	Base	Closed Cycle Cooling Unit 2: 60-day fish protection outage (FPO), 2016-2017; out of service (OOS), 2018; in-service 2019 Unit 3: 60-day FPO, 2016; OOS 2017; in-service 2018 Plus Spring refueling outages every 2 years (offsetting years, unit 2 and 3).
32	2 Seq. Years	Base	GrowWind 6 GW	Base	Base	
33	2 Seq. Years	Hi EE	Base (Low - 3GW)	Base	Base	
34	2 Seq. Years	Hi EE	GrowWind 6 GW	Other coal ret.	3 GW	
11	Fully OOS	Base	Base (Low - 3GW)	Base	Base	Fully OOS from 2016 through 2025
12	Fully OOS	Base	GrowWind 6 GW	Base	Base	Fully OOS from 2016 through 2025
13	Fully OOS	Hi EE	Base (Low - 3GW)	Base	Base	Fully OOS from 2016 through 2025
14	Fully OOS	Hi EE	GrowWind 6 GW	Other coal ret.	3 GW	Fully OOS from 2016 through 2025
41	In-Serv	Hi EE	GrowWind 8 GW	Other coal ret.	3 GW	Refueling only

Source: Synapse, 2014

** IPEC was modeled as fully in service ("In-Serv" in the table), fully out of service ("OOS") from 2016-2025, and out of service for sequential years in 2017 and 2018 for units 3 and 2 respectively following a 60-day fish protection outage (FPO) in year 2016 for both units and in 2017 for unit 2 ("2 Seq. Years")*

IPEC Outages

As seen in Table 3, three separate assumptions for the status of IPEC were modeled across our ten scenarios, which encompass permutations of IPEC outage, load (net of energy efficiency effects), and renewable resource deployment. First, we established baseline emissions by modeling IPEC fully in-service (with 24-month-interval refueling outages) from 2016-2025, in our scenario number 1.

In scenarios numbered 31 through 34, we modeled circumstances in which Indian Point Units 2 and 3 are each sequentially offline for one year periods for the construction of closed cycle cooling. For those outages, we conservatively assumed a one-year outage for each of the two units; and we assumed these outages would occur in consecutive years (unit 3 in 2017, unit 2 in 2018). These assumptions were made because we did not want to underestimate the emissions effect that would result in the event that closed-cycle cooling is installed for the units in this manner.

In particular, the Tetra Tech report indicates a 30-week (unit 2) and 35-week (unit 3) outages for the construction of closed cycle cooling,[27] while the Enercon report estimated a 42-week duration concurrent outage for the construction of closed cycle cooling. We did not use these specific estimates for the sequential year-long closed cycle cooling construction outage scenario because we wanted to be conservative and not underestimate emissions effects if the plants were out of service for the construction . Importantly, these outage scenarios are also conservative since they assume that the construction outage will occur early within the range of years analyzed and in later years emissions would be progressively less as additional renewable energy sources are available and implemented.

As part of this outage sequence, based on material from the NYSDEC Offer of Proof on fish protective outages,[28] we assumed that mitigation would be required in 2016 even if preparations for closed-cycle cooling construction outages were not yet complete. We chose to draw our assumption from the 62-day fish protective outage for 2016 to establish a need for replacement power in that year. While Synapse is aware that interim mitigation measures will be the subject of a different, later phase of the Indian Point hearing process , Synapse incorporated the 60-day outage assumption in order to reflect and model a more realistic and conservative scenario of closed cycle cooling construction at Indian Point. Synapse is further aware that there will be a range of interim outage scenarios which may be longer or shorter than Synapse's 60-day assumption. We note that Synapse will be providing a separate emissions and reliability analysis to specifically address interim and permanent fish protection outages in connection with the next phase of the hearings in this case, which will address a wider range of fish protection outage assumptions.

Thus, these closed-cycle cooling construction outage scenarios encompass a need for replacement power of different amounts in 2016, 2017, and 2018. Our primary aim was to examine the pattern of emissions and the pattern of replacement power given this modeled scenario.

In scenarios 11 through 14, we modeled scenarios in which both IPEC units are fully out of service after 2015. These scenarios remove IPEC from the system for during 2016-2025 in order to gauge a bookend effect on emissions in New York State. Counsel for Riverkeeper has informed Synapse that Riverkeeper's position is that scenarios relating to shutdown of the facility in connection with NYSDEC April 2, 2010 Denial of Entergy's requested Clean Water Act Section 401 water quality certification is properly the subject of review under the National Environmental Policy Act (NEPA) in connection with the Entergy NRC license renewal proceeding rather than under the NYSDEC SEQRA review process. Accordingly, we undertook this scenario both as a "worst case"/bookend scenario, and also to help us to understand analytically how the system responds to the loss of a large energy-supplying facility. In our opinion, even though it is not required for the purpose of NYSDEC SEQRA review, from a purely analytical standpoint, it helps us to understand both modeling idiosyncrasies and New York State power system response.

---

[27] Tetra Tech, at p. 23.

[28] NYSDEC Department Staff Offer of Proof on Permanent forced Outages/Seasonal Protective Outages, Table 3, page 15.

Importantly, the fully out of service scenarios which cover the full range of years 2016-2025 presents a conservative bounding assessment in relation to circumstances in which closed cycle cooling is constructed at Indian Point concurrently at both units during any given year between 2016-2025.

In addition, the data generated from these scenarios can be examined to determine the specific effects (relative to the baseline scenario 1) of year-long concurrent outages for the construction of closed cycle cooling construction. The effect of such concurrent construction outages can be seen for any of years 2016 through 2025. That is, these scenarios encompass potential circumstances in which concurrent outages of Indian Point Units 2 and 3 are taken for closed cycle cooling construction during any given year between 2016 and 2025. Under these scenarios we can see the emissions effects from concurrent outages of both generating units for any year-long period within the range of years examined. Notably, because this modeling assumes 52-week outages (rather than a 30, 35, or 42 week outage as suggested by other parties in this matter), the analysis, once again, provides a conservative outcome. In any event, it is worth noting that, although any incremental or decremental outage periods leads to incrementally lower or higher levels of replacement power, as is indicated by the specific result seen in our modeling for scenarios 31 through 34, the overall emission effect trends do not change considerably under minimally different outage periods for construction.

Our modeling did not involve any scenarios relating to emissions impacts resulting from the decreased generation output due to the actual operation a closed-cycle cooling system at Indian Point. We reviewed the information in the Tetra Tech and Enercon reports on the effects of parasitic losses and thermal efficiency degradation arising from operation of closed cycle cooling at Indian Point.[29] The anticipated maximum loss in net output, approximately 2-3%, can be characterized as negligible/"noise" in terms of statewide air emissions effects. That is, these effects are relatively small from the perspective of the entire New York State system, within forecast load variation. Thus, for the purpose of statewide emissions analysis, these effects can be ignored, as they would not have any meaningful impact on the results of our analysis.

Load and Demand-Side Assumptions

Two different loading scenarios were modeled across the 10 scenarios. For scenarios indicated as "Base" load, the 2013 Gold Book energy and peak demand values were used. For scenarios indicated as "High EE" or high energy efficiency, the New York State 15 x 15 loading scenario as contained in the 2012 RNA was used for energy and peak demand values. Table 4 below contains those assumptions for the New York control area as a whole. Appendix A contains this information by load zone for New York area. The PROSYM model aggregates the load in zones A and B; in zones C, D, and E; and in zones G, H, and I. The remaining zones F, J, and K are modeled as separate zones. For the out years (that is, 2023-2025) beyond which the 2013 Gold Book and the 2012 RNA did not have data, we extrapolated the average growth rate based on the growth rate trend between 2012 and 2022.

[29] Tetra Tech, at section 2.3.4 (page 19-20) and section 2.6 (page 25).

Table 4. Annual Energy and Peak Load, 2015-2025

	HI EE, RNA 15x15		Base Gold Book 2013	
	Energy	Peak	Energy	Peak
2012	163,653	32,822	163,653	33,295
2013	159,294	32,750	163,856	33,696
2014	158,073	32,549	164,652	33,914
2015	157,005	32,372	165,571	34,151
2016	158,180	32,556	166,804	34,345
2017	158,429	32,750	167,054	34,550
2018	159,050	33,051	167,703	34,868
2019	159,793	33,370	168,472	35,204
2020	160,804	33,675	169,499	35,526
2021	161,386	34,042	170,077	35,913
2022	162,174	34,342	170,915	36,230
2023	162,739	34,586	171,766	36,487
2024	162,970	34,818	172,439	36,732
2025	163,208	34,964	173,116	36,886

Source: NY ISO Gold Book, 2013; NY ISO 2012 Reliability Needs Assessment. Synapse extrapolation for 2023 – 2025.

Capacity Resources

Table 5 summarizes the resource capacity base included in the modeling. Our starting point was the updated (2013) Ventyx database of resources, which is based on the 2013 NYISO Gold Book resource database. We supplemented this in our scenario construction by adding gas, wind, solar, and planned Canadian hydro (via CHPE); and in some scenarios by retiring coal resources (Cayuga, Huntley).

Table 5. 2015 Base Case Capacity, MW, by Primary Fuel and NY Zone

Primary Fuel	AB (West)	CDE (Central North)	F (Capital)	GHI (SENY)	J (NYC)	K (LI)	Total
Nuclear	581	2,621	-	2,051	-	-	5,254
Hydro and Pumped Storage	2,804	1,303	1,541	80	-	-	5,728
Natural Gas	550	1,735	2,929	2,375	8,366	3,807	19,762
Petroleum - Oil and Kerosene	-	1,648	-	63	374	1,279	3,365
Coal	1,100	74	-	-	-	-	1,174
Demand Response	306	338	148	299	788	364	2,243
Wind	404	1,680	18	-	-	-	2,102
Other (sun, biomass, wood, refuse)	139	136	25	83	-	126	509
Total	5,885	9,535	4,661	4,951	9,528	5,577	40,136

Source: Synapse 2014 PROSYM Model Runs. Note: many natural gas and oil-fired units have the capability for burning multiple fuels.

Key Plant Additions and Retirements

In all of the scenarios we analyzed, two key downstate (i.e., PROSYM zone GHI) gas-fired additions were assumed in place—the CPV Valley combined cycle plant (678 MW, summer capacity rating) in 2016, and the Cricket Valley Energy Center combined cycle plant (1,020 MW, summary capacity rating) in 2018. We also added the 1,000 MW Champlain Hudson Power Express in 2018, represented as a NYC-connected resource. Additionally, repowering of the Astoria generation owned by NRG was assumed in stages, based on the current in-service dates listed in the NYISO generation queue: 250 MW for March of 2016, 250 MW for March of 2017, and 500 MW for June of 2018. In the later years of the analysis (post-2020), additional repowering of older gas-fired facilities is assumed to occur.

The scenarios assumed either a "base" level of wind, equal to roughly 3 GW of wind in New York State by 2025, or a "high" level of wind—6 GW, roughly equal to the quantity of wind analyzed in the "Growing Wind" wind integration report[30] if offshore wind were not in place. Lastly, we analyzed one scenario as a lowest emissions case bookend where a total of 8 GW of wind was assumed in place, 1.4 GW offshore plus 600 MW of additional wind beyond what was in place in the 6 GW onshore wind scenario. Base scenarios included relatively low levels of solar PV, and the "high PV" cases assumed a ramp up to roughly 3,000 MW (3 GW) of solar by 2025.

[30] NY ISO, Growing Wind, Final Report of the NY ISO 2010 Wind Generation Study, September 2010.

For some of the scenarios, Synapse assumed that the less economical of the remaining coal plants in New York—Cayuga and Huntley—would retire in 2016, leaving very little coal online, with coal energy provided almost solely by the AES/Somerset coal plant in western New York. Table 6 summarizes the resources changes made in these scenarios.

Table 6. Resource Additions and Retirements

Resource Addition or Retirement by Scenario	Quantity and Year
Base Scenarios (1,11, 13, 31, 33)	
Wind	Ramp up to 3,174 MW by 2025, CDE and AB
PV	18.6 MW utility scale by 2025; remaining behind-the-meter as part of net load.
Gas	CPV Valley, 678 MW (2016), Cricket Valley, 1,019 MW (2018), Astoria repower (1,040 in
Coal Retirement	Cayuga, Huntley - 2016
Other	Champlain Hudson Power Express, 2018
High Wind Only Scenarios (12, 32)	
Wind	Ramp up to 6,166 MW by 2025, Zones CDE and AB
PV	Same as Base
Gas	Same as Base
Coal Retirement	Same as Base
Other	Same as Base
High Wind, PV Scenarios (14, 34)	
Wind	Ramp up to 6,166 MW by 2025, Zones CDE and AB
PV	Ramp to 3,005 MW by 2025.
Gas	Same as Base
Coal Retirement	Base + all other coal except AES/Somerset
Other	Same as Base
Bookend – IPEC + High EE, Wind, PV (41)	
Same as Sc. 14, 34, plus Additional Wind	1.4 GW offshore wind, plus 200 MW additional onshore wind (LI for offshore; AB for onshore)

Source: Synapse, PROSYM mode inputs.

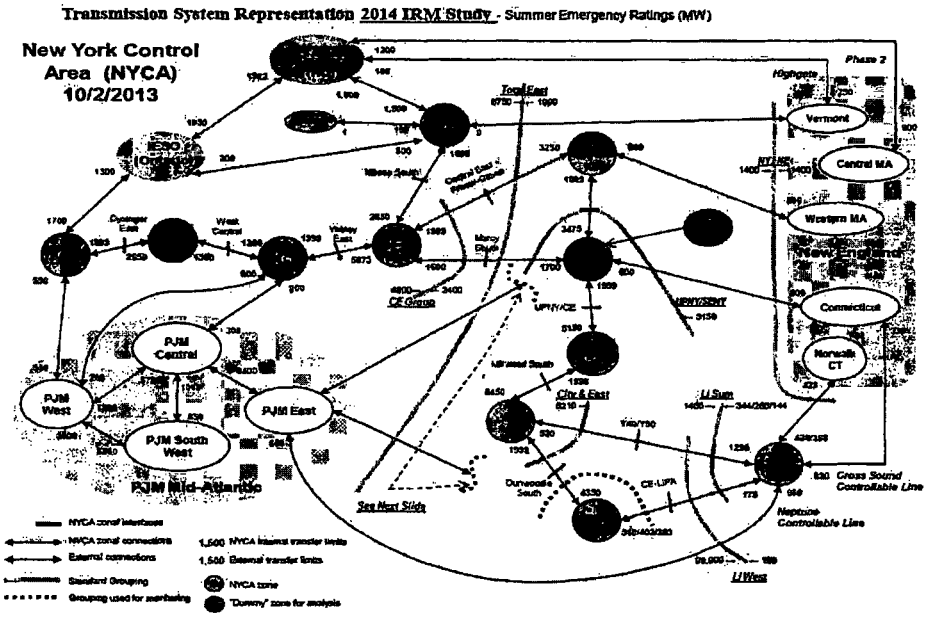
Transmission and Zones

Figures 5a and 5b below are representations of electric power transmission, interfaces and load zones for New York State, taken from the New York Control Areas Installed Capacity Requirement Technical Study Report for the 2014/2015 period. They illustrate the major transmission paths, limits, designated NYISO zones and geography, and the interconnections between New York and its adjacent regions.

In general, energy flows across the New York transmission system in a predominately west-to-east direction in upstate New York, and then southeast and south towards the heavier loading zones of New York City, Long Island, and the lower Hudson Valley. The key transmission constraints historically have been those that limit flows across the "Total East," the "Central East," and the "UPNY-SENY" paths, as seen in the representation in Figure 5a. To the extent those major paths are reinforced, and the flow limits increased, increased levels of power generated in upstate New York can flow over the system to load areas in the southern portions of the state.

Figure 5a. 2014 Schematic Representation of New York Transmission – Interfaces and Load Zones

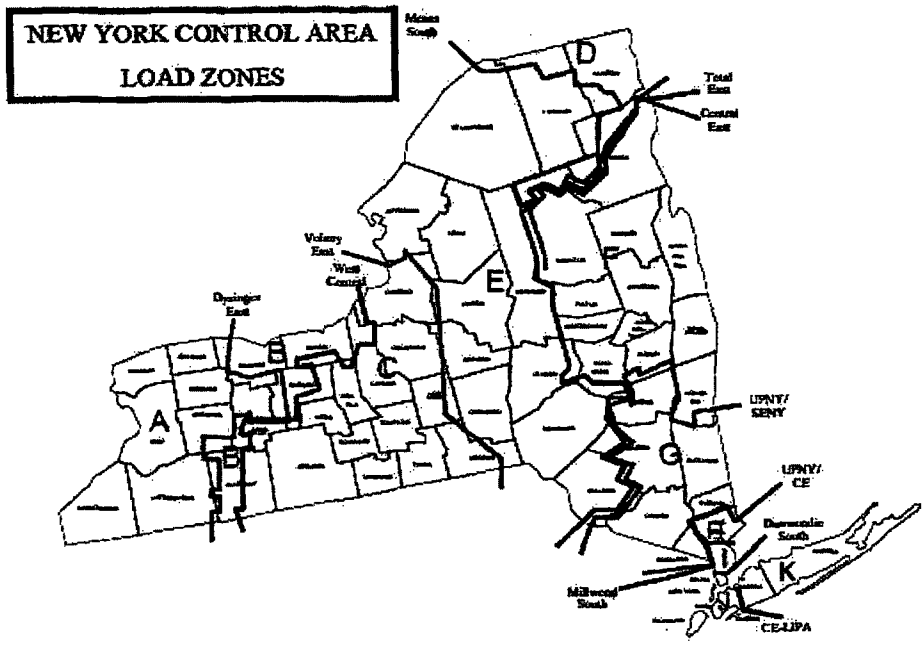
Figure A-12 2014 Transmission Representation



Source: New York State Reliability Council, LLC, Installed Capacity Subcommittee, Appendices, New York Control Area Installed Capacity Requirement For the Period May 2014 to April 2015: Page 37. December 6, 2013.

Figure 5b. 2014 Geographical Representation of New York Transmission – Interfaces and Load Zones

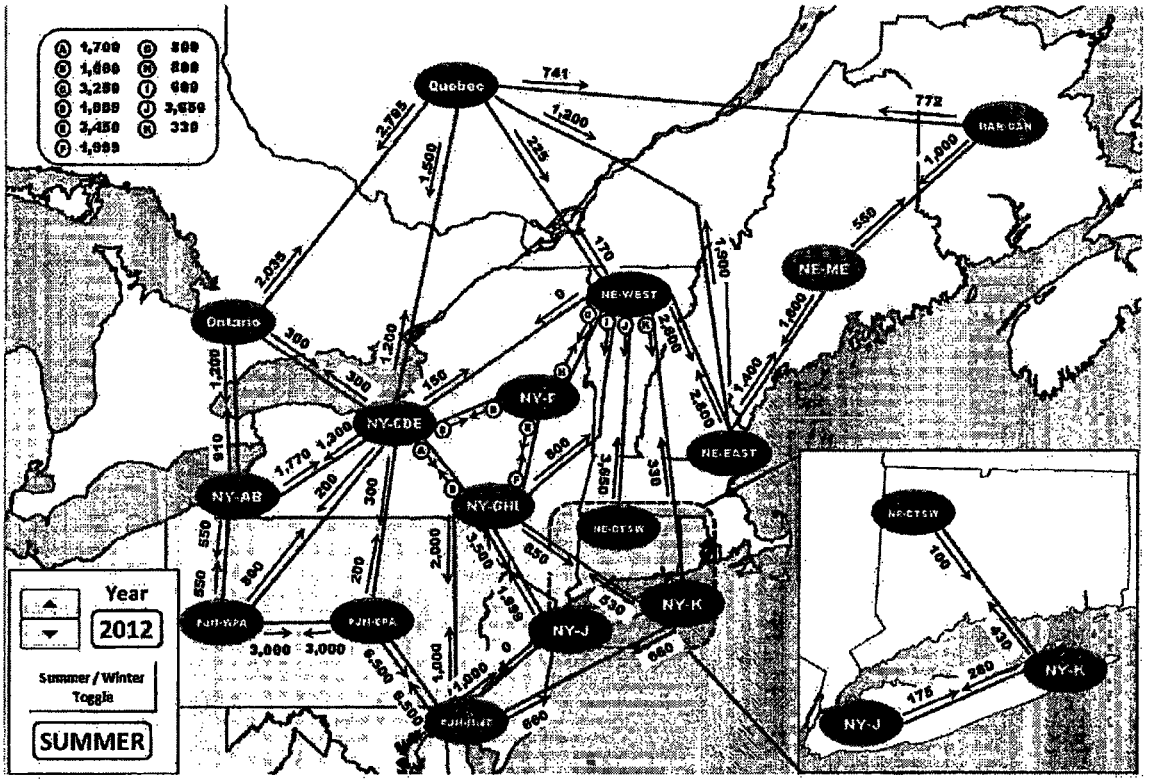
Figure 3-1 NYCA Load Zones



Source: New York State Reliability Council, LLC, Installed Capacity Subcommittee, Technical Study Report, New York Control Area Installed Capacity Requirement For the Period May 2014 to April 2015. Figure 3-1, NYCA Load Zones, Page 7. December 6, 2013.

Figure 6 below is an illustration of the baseline (circa 2012) New York zonal configuration used in the PROSYM model, along with the interconnected regions.

Figure 6. PROSYM Zonal Transmission Representation



Source: Market Analytics / Ventyx PROSYM Topology Illustration

Synapse updated a few key New York zone-to-zone transfer levels reflected in the PROSYM database to include increases estimated to occur with the installation of near-term transmission improvements (through 2016) due to the TOTS projects, and medium-term improvements (through 2019) arising from the AC transmission proceedings. We used the same transmission improvements across all scenarios. Table 7 below shows the zone-to-zone transfer levels prior to installation of the transmission upgrades, and after the upgrades are assumed to be in place, with the in-service year noted. Future year interzonal increases that may be implemented have not been included in our modeling. PROSYM uses these transfer levels to constrain its dispatch, essentially modeling the effect of transmission congestion across the zonal paths.

Table 7. Transmission Path Limit Representation in PROSYM Reflecting Projected Reinforcement Projects (MW)

From	To	2013	2014	2015	2016	2017	2018	2019	Increase, RRT + MSCC 2016	Increase, HVR + RRT + MSCC 2019
NY-CDE	NY-GHI	1700	1700	1700	2004	2004	2004	2202	304	502
NY-CDE	NY-F	3250	3250	3250	3310	3310	3310	3694	60	444
NY-F	NY-GHI	3450	3450	3450	3530	3530	3530	4468	80	1018
PJM-MidE	NY-GHI	1000	1000	1000	1000	1000	1000	1085		85
PJM-MidE	NY-J	1000	1000	1000	1000	1000	1000	1000		

Note: RRT = Ramapo to Rock Tavern 2nd 345 kV line. MSCC = Marcy South Series Compensation + Fraser to Coopers Corner reconductoring. HVR = Hudson Valley Reinforcement. CDE to GHI is assumed to be 33% of the UPNY-SENY path. F to GHI is assumed to be 67% of the UPNY-SENY path. CDE to F is assumed to be 100% of Central East path. CDE to GHI is assumed to be 25% of Total East path. CDE to F is assumed to be 47% of Total East path. PJM-MidE to GHI and PJMMidE to J are each assumed to be 14% of the Total East path. Source: Synapse PROSYM modeling, 2014, based on various sources of transfer increases for transmission projects.

Table 8 illustrates increases to transmission capacity across elements of the major paths in New York (as characterized in the PROSYM model) due to approved and planned transmission changes. The table reflects increases based on the following improvements:

- 2nd Ramapo to Rock Tavern 345 kV line, in service by June of 2016; it increases the UPNY-SENY thermal limits by 120 (normal) and 136 (emergency), the UPNY-ConEd thermal transfer limits by 1427 (normal rating) and 2784 (emergency rating), and increases the voltage transfer limits by 128 (UPNY-SENY) and 130 (UPNY-ConEd).[31] It increases the Total East limit by 59 (normal) and 66 (emergency).
- Marcy South Series Compensation and Fraser to Coopers Corner reconductoring (MSCC), also in service by June of 2016; it increases the Total East constraint path limit by 444 MW[32]; and
- NY Transco National Grid Hudson Valley Reinforcement (HVR) project between New York zones F and G, consisting of a third Leeds to Pleasant Valley 345 kV line.

These three improvements are interrelated. The NY Transco estimated the net effect of these improvements, along with additional improvements between Marcy and New Scotland and New Scotland and Leeds,[33] in a table they provided in response to the Energy Highway Blueprint.

---

[31] Con Edison Company of New York, Additional Information on Transmission Owner Transmission Solution for Indian Point Contingency Plan, Second Ramapo to Rock Tavern 345 kV Line Project, May 20, 2013, pages 8-10. ConEd / NYPA Compliance Filing with respect to development of Indian Point Contingency Plan, Proceeding on Motion of the Commission To Review Generation Retirement Contingency Plan, Case 12-E-0503, Exhibit B, "Detailed Description of the Marcy South Series Compensation and Fraser to Coopers Corner Reconductoring Project, page 10. Filed February 1, 2013.

[32] Final Report of the System Impact Study for the MSSC project, NYISO queue # 380. Submission of Comparable Information Pursuant to the April 19, 2013 Public Service Commission Order, Case 12-E-0503, Marcy South Series Compensation and Fraser to Coopers Corner Reconductoring Project, May 20, 2013.

Table 8. NY Transco Estimate of Thermal Transfer Path Increased from TOTS and AC Proceeding Projects

NYISO Transmission Interface	Basecase, MW	New Limit, MW	Net Increase, MW
UPNY – SENY	5942	7462	1520
UPNY – ConEd	6297	8674	2377
Central East	3151	3595	444
Total East	4640	5169	529
Moses South	1518	3672	2154

Source: NY Transco, "Increase in Upstate to Downstate Normal Transfer Capability Resulting from the Projects." Response to Energy Highway Blueprint, page 6.

The first two improvements from the list above (Ramapo to Rock Tavern 2nd 345 kV line, and MSSC) have been approved by the New York PSC in the IPEC Contingency Plan docket.[34] Various competing improvements are under consideration in the AC transmission proceeding. For the purposes of establishing baseline transfer increases for all cases modeled, we used the New York Transco Response NY Transco response to energy highway blueprint (page 6) to estimate the values of transfer limit increases for the UPNY/SENY interface. We computed increases for each of the PROSYM paths as shown in Table 9 above to model the effect of these improvements.

2.3. Modeling Results

Our results show a reasonable range of emission impacts over time that could be expected under different IPEC outage scenarios. We do note that we have not tested the full set of combinations of forward-looking resource development; in particular, we have not included future offshore wind installations with any IPEC outage scenarios,[35] nor have we increased energy efficiency development beyond the 15x15 scenario envisioned by New York State.[36] We have added the Champlain Hudson Power Express (in 2018) but have not assumed any further expansion of imports from Quebec or

---

[33] See NY Transco response to Energy Highway Blueprint, at page 6. NY Transco describes the complementary improvements (to the 3rd Leeds to Pleasant Valley line) needed to fully reinforce the Central East and the Total East path from Marcy to the south and east.

[34] NYS PSC Case 12-E-0503, November 4, 2013 Order.

[35] As noted, we did run a single scenario with roughly 8 GW of wind (including 1.4 GW of offshore wind) and with IPEC in-service; serving as a relative lower bound on CO_2 emissions across all of the scenarios we tested.

[36] The 15x15 scenario envisions a 15% reduction in energy consumption by 2015 relative to 2007 baseline consumption. See e.g., New York Public Service Commission, Case 07-M-0548, Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio Standard, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs, June 23, 2008.

Ontario.[37] We have limited upstate onshore wind development to roughly 6 GW by 2025, in line with the maximum non-offshore-wind scenario tested in the "Growing Wind" report[38] but not reflective of likely technical maximum penetrations of wind power.[39] We have tested the effects of installation of a total of 3 GW of solar PV by 2025,[40] and while this reflects an aggressive level of growth, it is not unreasonable to envision even larger penetrations of this resource over time.[41] Thus, from the perspective of longer-range emissions targets for New York, our resource development assumptions are conservative; i.e., lower levels of emissions could be seen with more aggressive renewable resource and energy efficiency development, and/or imports of Canadian renewable resources.

Generation Supply—2012 Actual and Base Scenario

Table 9 shows the 2012 annual generation (GWh) and share (%) in New York by fuel, and estimated import levels for each of Quebec, Ontario, New England, and PJM sources.

---

[37] Our analysis shows reductions in imports over the historical paths into upstate New York from Ontario and Quebec (i.e., into zones A and D) in the later years (post-2020) in most scenarios. While this likely reflects in part the effect of more wind coming online in the upstate zones, utilizing available transmission, resource limitations prevented further analysis of Ontario and Quebec systems to determine whether higher levels of future year imports represent reasonable scenarios for analysis.

[38] NYISO, "Growing Wind: Final Report of the NYISO 2010 Wind Generation Study," September 2010.

[39] For example, in our 6 GW wind scenarios with 15x15 efficiency reflected in the annual energy demand, wind represents roughly an 11% statewide energy share in 2025 (18 TWh /163 TWh). Wind penetration amounts greater than 11% of annual energy consumption can generally be accommodated.

[40] Based on New York public policy aims. See, for example, the Petition of NYSERDA, before the New York Public Service Commission, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, Case 03-E-0188, Petition, NY-SUN 2016-2023 Funding Considerations and Other Program Implementation Considerations, page 2.

[41] Solar photovoltaic costs have been declining precipitously, making their installation more economic. See for example, *Tracking the Sun VI: An Historical Summary of the Installed Price of Photovoltaics in the United States from 1998 to 2012*, July 2013, by Galen Barbose, Naïm Darghouth, Samantha Weaver and Ryan Wiser. Available at http://emp.lbl.gov/sites/all/files/lbnl-6350e.pdf.

Table 9. 2012 New York Energy Balance by Fuel or Source

Resource Fuel	2012 GWh	2012 share
Hydro & Pumped Storage	25,303	15.5%
Nuclear	40,817	25.1%
Coal	4,281	2.6%
Oil #2/Oil #6/Kerosene	200	0.1%
Wind	3,060	1.9%
Other	2,998	1.8%
Estimated Net Imports (QC, Ont, PJM, NE)	23,705	14.6%
Quebec	10,184	6.3%
Ontario	5,241	3.2%
PJM	7,107	4.4%
NE	1,173	0.7%
Nat Gas Zones A-I	24,854	15.3%
Nat Gas Zone J (NYC)	26,663	16.4%
Nat Gas Zone K (LI)	10,961	6.7%
Total Consumption	162,842	100.0%
New York In-State Generation*	139,137	85.4%

**includes Linden Cogen and Bayonne Energy Center. Source: 2013 Gold Book, Actual 2012 generation for New York generation. Total consumption from NYISO Power Trends 2013, page 18. Total imports estimated from balance of New York generation and total consumption, source of imports estimated from 2012 State of the Market Report.*[42] *Dual-fuel sources estimated to have consumed gas in 2012, based on economics.*

Table 10 below shows Synapse's base scenario (1) generation for 2015-2019, and for 2025, by fuel source and disaggregated by PROSYM zone for natural gas sources.

[42] The 2012 State of the Market Report contains additional information on imports into New York from the surrounding regions during 2012. It contains average MW flow information as scheduled, but excludes the effects of loop flows, and does not contain estimates of the actual total energy (GWH) amounts from each adjacent area.

Table 10. Synapse Base Scenario (1) Modeled Generation (TWh), 2015-2019, 2025, and Actual 2012

	2012 Actual	2015	2016	2017	2018	2019	2025
Hydro & PS	25.3	27.3	27.3	27.4	27.2	27.2	27.3
Nuclear	40.8	40.0	39.5	39.9	39.1	40.3	40.3
Coal	4.3	5.4	5.0	4.6	3.2	3.2	1.8
Oil/Kerosene	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Wind	3.1	5.9	5.9	6.1	6.1	6.1	9.2
Other	3.0	3.1	3.3	3.3	3.2	3.3	3.5
Imports	23.7	18.0	16.4	16.4	20.1	20.1	12.6
Nat Gas All Zones	62.5	66.5	70.5	70.5	69.9	69.3	80.3
NG - AB	24.9	1.9	1.9	1.8	1.6	1.6	1.5
NG - CDE		9.4	9.2	8.9	8.1	8.1	7.4
NG - F		17.8	17.5	16.3	12.5	12.0	9.4
NG - GHI		0.7	4.3	5.9	12.6	12.5	16.5
NG - J	26.7	25.0	26.0	26.5	24.6	24.5	28.9
NG - K	11.0	11.6	11.6	11.1	10.5	10.6	16.5
Total	162.8	166.1	167.9	168.2	168.8	169.5	174.9

Source: 2015-2019, 2025: Synapse 2014 PROSYM scenario 1. 2012 Actual from Table 9 above.

The base scenario contains roughly constant annual output for nuclear, hydro, and pumped storage resources in New York. It shows an increase in coal use in 2015 relative to actual coal plant output in 2012, reflecting underlying load growth and the economics of coal vs. gas as a marginal fuel, but in later years, coal use declines. Wind power doubles its output by later in the decade relative to actual production in 2012, and triples its output by 2025—this arises from our base scenario assumption that New York will have an installed wind capacity of roughly 3.1 GW by 2025. Oil use remains extremely low; for example, the highest year of oil consumption in our base case is 22 GWh, much less than one-tenth of one percent of the State's electricity consumption. Our 2012 actual values recognize dual-fuel units but assume gas use in that year due to economics. Our modeling estimates gas use for dual-fuel units in general because of economics.

Replacement Power Sources Under Different Outage Scenarios

The following two tables (Tables 11 and 12) contain summary results estimating average annual replacement power source shares under four different scenarios: two outage scenarios reflecting sequential year-long outages at Indian Point Units 3 and 2 in 2017 and 2018, respectively following a 60-day fish protection outage in 2016 for both units and a 60-day outage in 2017 for unit 2 (scenarios 31 and 34), and two scenarios reflecting both units of IPEC being fully out-of-service from 2016-2025

(scenarios 11 and 14). For each of these scenarios we use base levels and high levels of EE, wind and solar PV.

As noted, for each outage scenario, we show replacement power for base level resource assumptions (scenario 11 and scenario 31) and for high levels of energy efficiency, wind, and solar PV deployment (scenario 14 and scenario 34). In the sequential year-long outage scenarios, [43] we show replacement power requirements for three years, 2016 through 2018 (both units are modeled back online in 2019).

Table 11. Replacement Power Source Shares - Year-Long Sequential Outage Scenarios 31 (Base) and 34 (High EE, Wind, PV)

	Base EE, Wind, PV - Scen. 31			High EE, Wind, PV - Scen. 34		
	2016	2017	2018	2016	2017	2018
Imports (QB, Ont, NE, PJM)	31%	34%	25%	-56%	11%	-5%
Gas – J	20%	18%	23%	-46%	0%	-11%
Gas – F	15%	20%	25%	-26%	8%	-1%
Gas - GHI	17%	8%	18%	4%	4%	6%
Gas - CDE	5%	7%	5%	0%	4%	1%
Coal	3%	4%	8%	-204%	-46%	-38%
Gas – K	3%	4%	2%	-27%	-3%	-8%
Gas - AB	1%	2%	1%	3%	2%	1%
Wind				0%	0%	16%
EE				388%	100%	118%
PV				64%	21%	32%
Other	4%	1%	-7%	0%	0%	-10%
	100%	100%	100%	100%	100%	100%
Replacement TWh:	2.2	8.9	7.3	2.2	8.9	7.3

Source: Synapse PROSYM Modeling Analysis, 2014.

As seen, in the base scenario (31) the proportion of replacement power varies as replacement power need changes (from 2.2 TWh in 2016 to 8.9 and 7.3 TWh in 2017 and 2018) and reflecting transmission

[43] Under these scenarios, Synapse estimated a 60-day interim mitigation outage for 2016 for both units and for unit 2 in 2017. Synapse understands that a range of interim measures, some lengthier, some shorter, will be considered during separate, future hearings in this matter. Thus, while we selected a 60-day interim mitigation outage assumption in order to make out assessment of sequential one-year closed-cycle cooling construction outages scenarios more realistic and conservative in nature, our assumption does not necessarily reflect the most conservative estimate for potential replacement power. In any event, while any incremental or decremental outage periods leads to lower or higher levels of replacement power, overall emission effect trends do not change considerably under minimally different outage periods. We note that Synapse will be providing a separate, complete analysis in relation to interim mitigation outages and permanent fish protection outages for future portions of the Indian Point proceedings, which will analyze the full range of potential outage scenarios.

and gas-fired resource deployment (e.g., repowered Astoria units online in 2018; Cricket Valley (zone GHI) online in 2018; upstate-to-downstate path limit increase in 2018).

In the high energy efficiency, wind, and PV deployment scenario (34), statewide efficiency, wind, and PV more than replace IPEC's reduced output, but increased gas use is still required in some zones reflecting locational requirements, which the model respects. Coal use is much lower, and notably gas use in zone J also declines in 2016 and in 2018, remaining about the same in 2017. These results illustrate the interdependence of resource deployment, especially energy efficiency gains and transmission improvements when gauging sources of replacement power. With lower load (a result of energy efficiency) and increased sources of zero-fuel-cost energy (wind, PV), the remaining mix of marginal units (imports and in-state gas generation) is economically "redispatched" in the model. As new units come online (e.g., Astoria repower, Cricket Valley) they not only provide replacement power but displace output from older, higher-heat-rate gas-fired units. Thus, use of a full economic dispatch model reflecting these interacting effects is required to properly gauge resulting locational and source impacts under outage scenarios.

In the IPEC fully out-of-service from 2016-2025 scenarios (scenarios 11 and 14), presented in the table below, replacement power amounts are higher than those seen in the scenarios in which there are sequential year-long outages at Indian Point Units 3 and 2 in 2017 and 2016, respectively following a 60-day fish protection outage in 2016 (scenarios 31 and 34), which reflect the full output of both IPEC units for all other years. We show these results for 2016, 2019, and 2025, to convey immediate impacts and longer-term trends.[44]

[44] We also note that the impact shown for the out-of-service scenarios could be used to estimate impacts for any given single year for a closed cycle cooling construction outage scenario involving a dual-unit outage occurring conservatively for one year. Importantly though, the results presented, which focus on the fully out of service scenario for the full range of years 2016-2025 presents a conservative bounding assessment in relation to circumstances in which closed cycle cooling is constructed at Indian Point concurrently at both units during any given year between 2016-2025.

Table 12. Replacement Power Source Shares – IPEC Out-of-Service Scenarios 11 (Base) and 14 (High EE, Wind, PV)

	Base EE, Wind, PV - Scen. 11			High EE, Wind, PV - Scen. 14		
	2016	2019	2025	2016	2019	2025
Imports (QB, Ont, NE, PJM)	36%	24%	25%	25%	7%	-5%
Gas – J	18%	22%	26%	9%	6%	-8%
Gas – F	16%	25%	19%	13%	10%	-3%
Gas – GHI	7%	13%	16%	6%	8%	-1%
Gas – CDE	6%	5%	3%	6%	3%	-1%
Coal	6%	6%	3%	-29%	-18%	-10%
Gas – K	5%	2%	4%	2%	-3%	-3%
Gas – AB	2%	1%	0%	2%	1%	0%
Wind	0%	0%	0%	0%	15%	59%
EE				58%	53%	42%
PV				9%	18%	30%
Other	3%	2%	2%	0%	0%	0%
	100%	100%	100%	100%	100%	100%
Replacement TWh:	15.7	15.6	15.5	15.6	15.6	15.6

Source: Synapse PROSYM Modeling Analysis, 2014.

The rough proportions of replacement power are not too different in the base case (11, no incremental energy efficiency, wind, or PV) from that seen in the two year-long sequential outage base scenario (31), though the absolute levels are much higher. Notably, in the high energy efficiency, wind and solar PV scenario (14) the demand-side and renewable resources more than fully displace the entirety of the IPEC unit output by the end of the modeled period (2025), and even by 2019 these resources displace more than 85% of the IPEC loss. The net effect, including coal resource output reductions, is a modest increase in gas-fired generation in 2016 and 2019 to round out replacement power needs.

New York State Aggregate Emissions across Scenarios

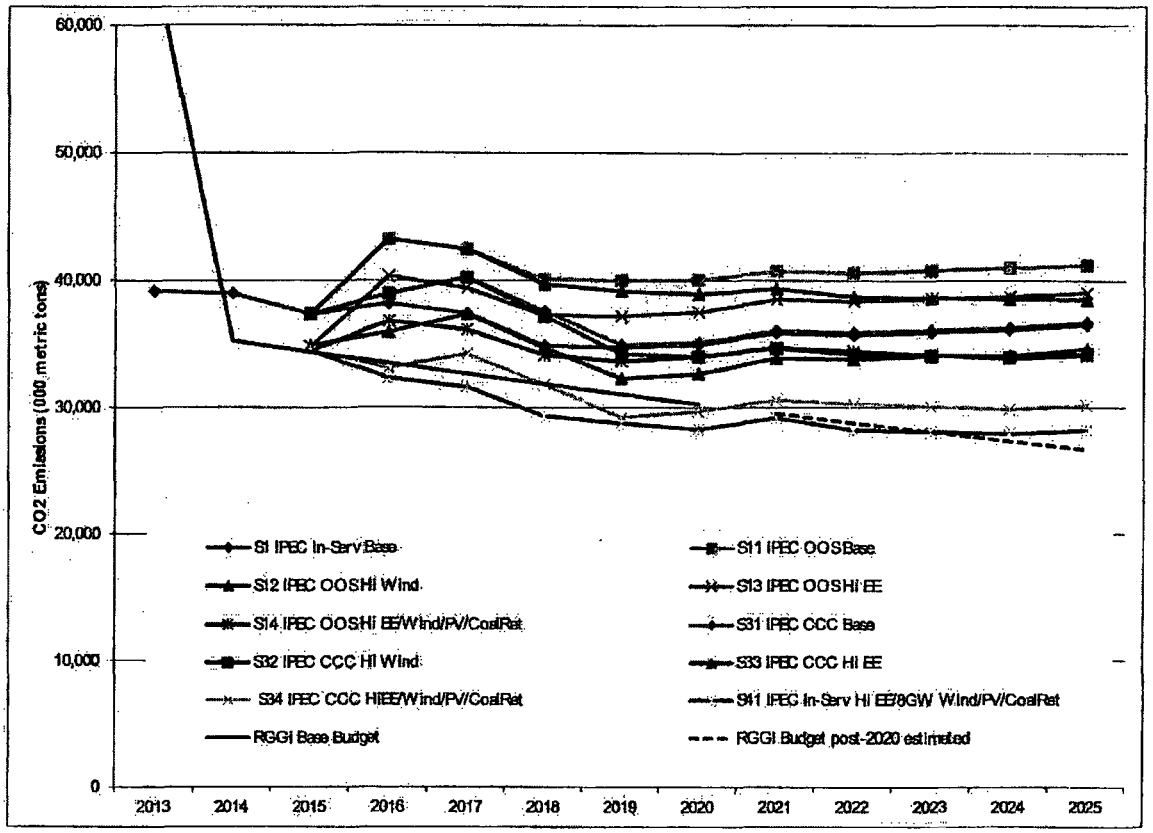
Figures 7 through 9 show projected CO_2, SO_2 and NO_x emissions across New York State between 2015 and 2025 for 10 scenarios, based on our modeling results. Data tables are included below the figures.

The CO_2 emission pattern shows that continuing declines in CO_2 emissions will only be seen if steps are taken to deploy more energy efficiency and renewables than is represented in the base scenario, irrespective of whether or not the IPEC units remain in service. We note that further declines are possible if energy efficiency deployment beyond the "15 x 15" modeled (in the high energy efficiency scenarios) is undertaken, and if increased levels of wind deployment occur—in particular including more offshore wind (which we only model in one bookend scenario, shown as the lowest CO_2 emission line in

the graph). As we note, while we modeled an array of scenarios to test emission (and replacement power) effects under different IPEC outages, we did not test all feasible resource deployment strategies.

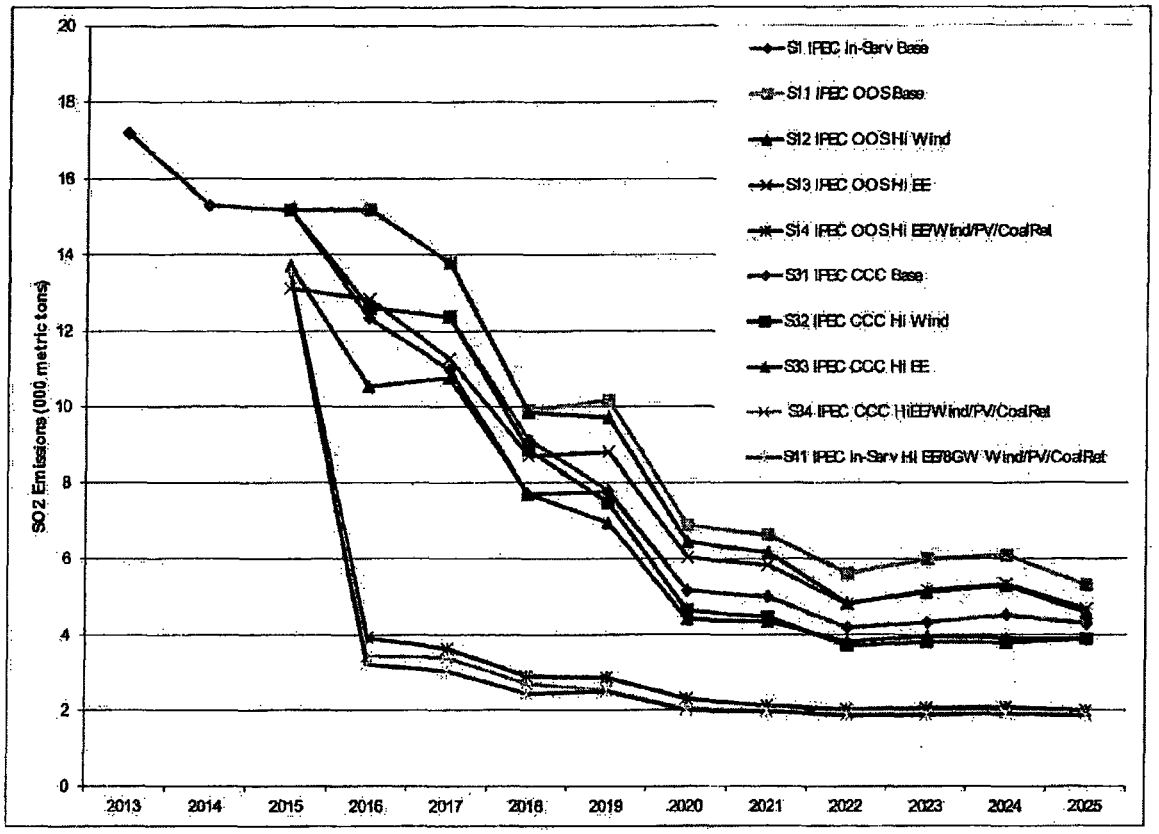
The SO_2 and NO_x emissions trends show a clear pattern of declining emissions over the years, with a more dramatic decline seen for the SO_2 emissions in scenarios where we assumed the retirement of some upstate coal units (only coal and oil units contribute to SO_2 emissions, as natural gas does not contain sulfur). Each of the two figures shows a predominant pattern of declining emissions from in-state resources. Increasing use of wind and solar, reduced use of coal, and increasing use of newer gas-fired plants (displacing older, higher-NO_x-emitting gas plants) are the primary driving factors behind these trends.

Figure 7. Annual CO_2 Emissions, New York Electric Power Sector, 2015-2025, 10 Modeled Scenarios



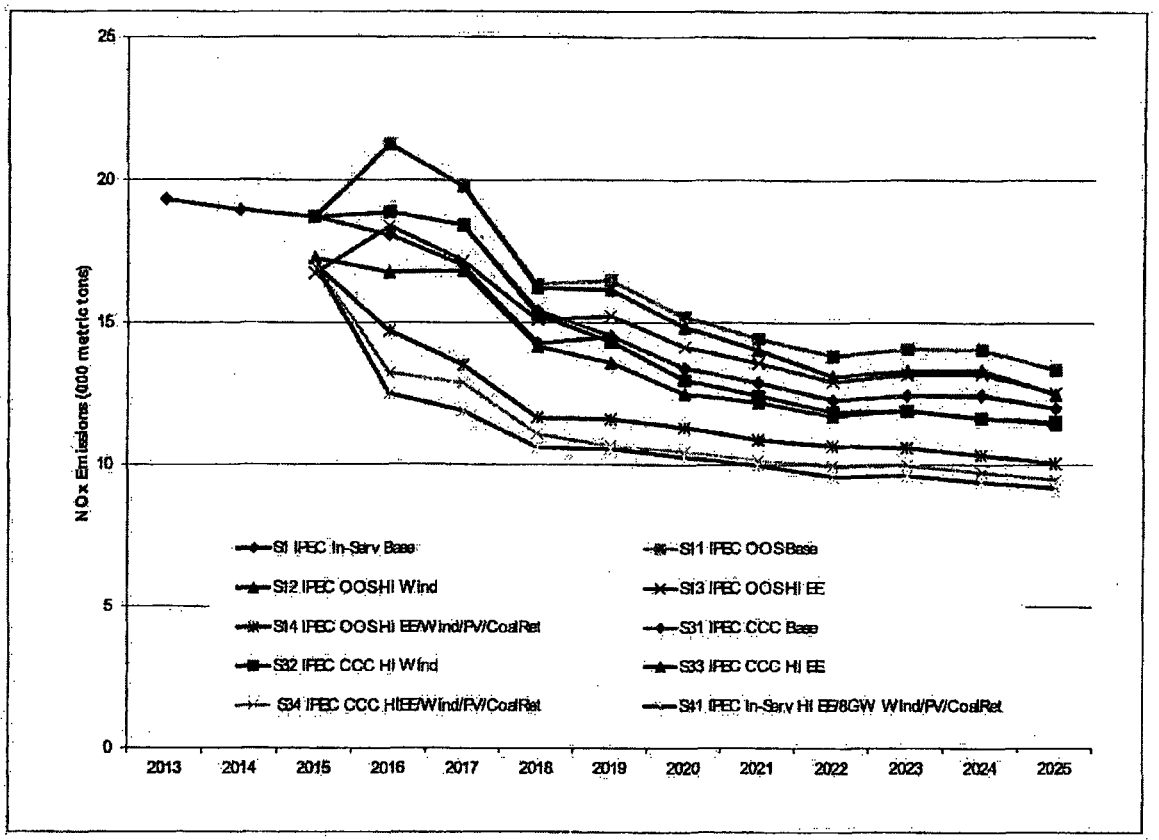
	S1 IPEC In-Serv Base	S11 IPEC OOS Base	S12 IPEC OOS Hi Wind	S13 IPEC OOS Hi EE	S14 IPEC OOS Hi EE/Wind/PV/CoalRet	S31 IPEC CCC Base	S32 IPEC CCC Hi Wind	S33 IPEC CCC Hi EE	S34 IPEC CCC HiEE/Wind/PV/CoalRet	S41 IPEC In-Serv Hi EE/8GW Wind/PV/CoalRet	RGGI Base Budget	RGGI Budget post 2020 estimated
2013	39,153										64,371	
2014	38,980										35,229	
2015	37,386	37,386	37,386	34,768	34,458	37,386	37,386	34,851	34,458	34,458	34,348	
2016	38,194	43,219	43,219	40,330	36,807	38,977	38,977	35,938	33,119	32,321	33,489	
2017	37,425	42,449	42,449	39,410	36,130	40,248	40,248	37,371	34,222	31,624	32,652	
2018	34,836	40,089	39,738	37,246	34,129	37,580	37,220	34,688	31,813	29,322	31,836	
2019	34,742	40,008	39,189	37,201	33,649	34,911	34,191	32,301	29,222	28,749	31,040	
2020	34,940	40,036	38,956	37,516	34,015	35,125	34,004	32,657	29,699	28,267	30,264	
2021	35,863	40,737	39,366	38,531	34,716	36,046	34,663	33,887	30,585	29,165		29,507
2022	35,715	40,602	38,727	38,376	34,427	35,905	34,192	33,804	30,283	28,206		28,770
2023	35,914	40,796	38,643	38,585	34,129	36,090	34,110	34,090	30,079	28,067		28,050
2024	36,140	40,991	38,574	38,747	33,895	36,288	33,966	34,089	29,873	27,893		27,349
2025	36,530	41,193	38,531	39,050	34,122	36,711	34,240	34,604	30,185	28,205		26,665

Figure 8. Annual SO_2 Emissions, New York Electric Power Sector, 2015-2025, 10 Modeled Scenarios



	S1 IPEC In-Serv Base	S11 IPEC OOS Base	S12 IPEC OOS Hi Wind	S13 IPEC OOS Hi EE	S14 IPEC OOS Hi EE/Wind/PV/CoalRet	S31 IPEC CCC Base	S32 IPEC CCC Hi Wind	S33 IPEC CCC Hi EE	S34 IPEC CCC HiEE/Wind/PV/CoalRet	S41 IPEC In-Serv Hi EE/8GW Wind/PV/CoalRet
2013	17.2									
2014	15.3									
2015	15.2	15.2	15.2	13.1	13.5	15.2	15.2	13.7	13.5	13.5
2016	12.3	15.2	15.2	12.8	3.9	12.6	12.6	10.5	3.4	3.2
2017	11.0	13.8	13.8	11.3	3.6	12.4	12.4	10.8	3.4	3.0
2018	7.7	9.9	9.9	8.7	2.9	9.1	8.9	7.7	2.7	2.4
2019	7.8	10.2	9.7	8.8	2.9	7.8	7.5	6.9	2.5	2.5
2020	5.2	6.9	6.4	6.0	2.3	5.2	4.6	4.4	2.0	2.0
2021	5.0	6.6	6.2	5.8	2.1	5.0	4.5	4.3	2.0	2.0
2022	4.2	5.6	4.8	4.8	2.0	4.2	3.7	3.8	1.9	1.9
2023	4.3	6.0	5.1	5.2	2.1	4.3	3.8	4.0	1.9	1.9
2024	4.5	6.1	5.3	5.3	2.1	4.5	3.8	3.9	1.9	1.9
2025	4.3	5.3	4.6	4.7	2.0	4.3	3.9	3.9	1.9	1.8

Figure 9. Annual NOX Emissions, New York Electric Power Sector, 2015-2025, 10 Modeled Scenarios



	S1 IPEC In-Serv Base	S11 IPEC OOS Base	S12 IPEC OOS Hi Wind	S13 IPEC OOS Hi EE	S14 IPEC OOS Hi EE/Wind/PV/CoalRet	S31 IPEC CCC Base	S32 IPEC CCC Hi Wind	S33 IPEC CCC Hi EE	S34 IPEC CCC HiEE/Wind/PV/CoalRet	S41 IPEC In-Serv Hi EE/8GW Wind/PV/CoalRet
2013	19.3									
2014	18.9									
2015	18.7	18.7	18.7	16.7	17.0	18.7	18.7	17.3	17.0	17.0
2016	18.1	21.2	21.2	18.4	14.7	18.9	18.9	16.8	13.2	12.5
2017	17.0	19.8	19.8	17.2	13.5	18.4	18.4	16.8	12.9	11.9
2018	14.3	16.3	16.2	15.1	11.7	15.4	15.3	14.2	11.1	10.6
2019	14.5	16.5	16.2	15.2	11.6	14.5	14.3	13.6	10.6	10.6
2020	13.4	15.2	14.8	14.1	11.3	13.4	13.0	12.5	10.4	10.3
2021	12.9	14.4	14.0	13.6	10.9	12.9	12.4	12.2	10.1	10.0
2022	12.3	13.8	13.1	12.9	10.7	12.3	11.9	11.7	10.0	9.6
2023	12.4	14.1	13.3	13.2	10.6	12.4	11.9	11.9	10.0	9.6
2024	12.4	14.1	13.3	13.2	10.3	12.5	11.6	11.7	9.7	9.4
2025	12.0	13.3	12.5	12.5	10.0	12.0	11.5	11.4	9.5	9.2

New York Wholesale Locational Energy Prices

The purpose of our analysis was to show how emissions change under different outage scenarios, and under different assumptions for energy efficiency, wind and solar installations, and transmission reinforcement. In conducting this analysis, we also estimated replacement power resources under IPEC outage scenarios. However, economic dispatch modeling also produces zonal clearing prices, reflective of the wholesale market locational prices in New York. One can assess the broad price trends associated with different outage scenarios and in combination with other key assumptions. Table 13 below shows the base case (scenario 1) prices from our scenario modeling. Tables 14 and 15 that follow show the relative price change from the base scenario pricing for two scenarios, one with IPEC fully out of service from 2016-2025 and no change to other assumptions (scenario 11), and one with IPEC fully out of service from 2016-2025 with installation of increased energy efficiency, wind, and PV resources (scenario 14).

Table 13, New York Wholesale Energy Prices by PROSYM New York Zone, 2015-2025, Scenario 1 (IPEC In-Service)

2012 $/MWh	AB	CDE	F	GHI	J	K
2015	36.1	37.5	39.4	41.9	44.6	46.0
2016	36.8	38.2	40.2	42.2	45.9	48.1
2017	38.0	39.3	41.3	43.3	46.1	48.4
2018	37.8	38.9	40.8	42.7	44.5	49.2
2019	39.0	40.3	42.1	44.0	45.8	51.0
2020	42.5	43.5	45.4	47.4	49.5	54.8
2021	44.9	45.4	47.4	49.5	51.5	55.5
2022	46.4	47.0	49.1	51.2	53.0	57.6
2023	48.5	49.0	51.1	53.3	55.1	60.2
2024	50.1	50.6	52.9	55.2	57.0	60.1
2025	51.8	52.3	54.7	57.0	58.4	60.9

Source: 2014 Synapse PROSYM Production Cost Model Run, Scenario 1

Table 14. New York Wholesale Energy Price Change from Base Scenario 1, Percent, by PROSYM New York Zone, 2015-2025, Scenario 11 (IPEC Out of Service, Base case values for EE, Wind, PV)

	AB	CDE	F	GHI	J	K
2015	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2016	3.3%	3.9%	4.3%	9.7%	2.5%	1.2%
2017	3.2%	3.8%	4.2%	6.5%	1.7%	0.7%
2018	3.0%	3.5%	3.9%	4.6%	1.7%	0.0%
2019	3.5%	4.1%	4.1%	4.2%	1.7%	-0.1%
2020	3.0%	3.7%	3.7%	3.7%	1.2%	-0.3%
2021	2.7%	3.3%	3.3%	3.4%	1.4%	0.2%
2022	2.5%	3.0%	3.1%	3.3%	1.6%	0.0%
2023	2.4%	3.0%	3.1%	3.3%	1.4%	0.1%
2024	2.3%	2.8%	2.9%	3.0%	1.3%	0.5%
2025	2.1%	2.6%	2.7%	2.8%	1.6%	1.0%

Source: 2014 Synapse PROSYM Production Cost Model Run, Delta, Sc. 11 minus Sc. 1

Table 15. New York Wholesale Energy Price Change from Base Scenario 1, Percent, by PROSYM New York Zone, 2015-2025, Scenario 14 (IPEC Out of Service, High EE, High Wind, High PV)

	AB	CDE	F	GHI	J	K
2015	-3.9%	-3.6%	-2.7%	-3.1%	-2.5%	-1.9%
2016	3.3%	2.6%	3.8%	7.3%	0.0%	-1.2%
2017	2.9%	2.4%	3.4%	4.7%	-0.3%	-1.2%
2018	0.7%	0.9%	2.3%	2.7%	-0.2%	-1.8%
2019	1.5%	1.7%	2.3%	2.3%	-0.3%	-2.4%
2020	0.5%	1.2%	1.7%	1.8%	-0.6%	-2.2%
2021	-0.1%	0.8%	1.2%	1.3%	-0.6%	-1.7%
2022	-0.9%	0.0%	0.8%	1.0%	-0.6%	-1.9%
2023	-1.5%	-0.4%	0.5%	0.7%	-0.8%	-2.1%
2024	-2.5%	-1.2%	0.2%	0.4%	-0.9%	-1.8%
2025	-3.1%	-1.8%	-0.1%	0.1%	-0.6%	-1.4%

Source: 2014 Synapse PROSYM Production Cost Model Run, Delta, Sc. 14 minus Sc. 1

Tables 14 and 15 illustrate two fundamental price aspects of the New York wholesale electric power market. Table 14 shows that all else equal, loss of the IPEC output has an effect on energy prices, although the average effect is minimal; in particular, downstate zones show very low price increases, reflecting the economics of a constrained power system. The average effect varies by zone, due to transmission loss and congestion effects. The tables do not show variation in prices within the year, or

between day and night,[45] but generally the average annual effect shown here is more pronounced during periods when load is higher, and less pronounced during periods when load is lower.

Table 15 demonstrates that increased energy efficiency, and increased deployment of inframarginal,[46] zero-fuel cost wind, and solar PV, mitigate the price impacts associated with the loss of output from IPEC units. As seen, price changes seen with IPEC out of service with increased deployment of these resources are lower than price changes without these resources, and in some zones in some years—especially the J and K downstate zones of NYC and LI in all years—absolute prices are lower in scenario 14 (IPEC fully out of service, but high levels of energy efficiency, wind, and PV) than they are in the base scenario.

For the scenarios involving sequential year-long outages at Indian Point Units 3 and 2 in 2017 and 2016, respectively following a 60-day fish protection outage in 2016 (scenarios 31 and 34), the price impacts will be non-existent in later years (once both units are back in service); and, unless outages take longer than anticipated, will be less than is seen for the fully out-of-service from 2016-2025 scenarios shown here since construction outages are estimated to last less than a full year.[47]

2.4. Discussion

Changes in resource output across locations in New York State are influenced significantly by interdependent changes in projected load, key transmission reinforcements planned and proposed for New York's transmission system, and the availability of both renewable resources and new gas-fired generation in zone GHI. These influences are clearly seen in the near term by the downward trajectory of emissions between 2017 and 2019 in all scenarios, as the effect of critical near-term, congestion-reducing transmission reinforcement, GHI-zone gas-fired resources, and increases in upstate wind help to reduce fossil-fuel use downstate, even with IPEC outages. Over the longer-term, NO_X and SO_2 emissions continue their decline in all scenarios, as coal use declines and reduced NO_X emissions from newer gas-fired sources replace older unit output. CO_2 emissions flatten out after 2019, but remain roughly at the RGGI benchmark under scenarios with higher levels of energy efficiency, wind and PV and with closed cycle cooling installed at IPEC in sequential year-long outages and in place by the end of 2018 (scenario 34). CO_2 emissions are higher for scenarios that do not include more aggressive pursuit of energy efficiency and renewable resources, and if IPEC were not in service. However, based on differential CO_2 emissions between scenario 34 and scenario 41, (scenario 41 is our bookend scenario for lowest CO_2 emissions, with IPEC in service, high levels of energy efficiency, PV, and wind, including 2 additional GW of wind (8,117 MW total by 2025)) it can be seen that CO_2 emissions can be lowered with

[45] The New York electric energy market prices electricity on an hourly basis, thus price variation exists on multiple time scales across the year.

[46] "Inframarginal" refers to generation units that do not set the clearing price and have the effect of "stretching" the system supply curve such that for any given level of demand, prices are lower.

[47] For example, the Tetra Tech report indicates a 30 to 35 week outage period (p. 23) and the Enercon report indicates a 42-week outage period (Attachment 9).

additional renewables – or increased levels of energy efficiency. For example, by 2025, Scenario 41 has CO_2 emissions that are 2.2 million metric tons per year lower than the emissions of scenario 34 (IPEC in-service with closed cycle cooling installed by end of 2018 after sequential year-long outages) thus indicating a 6.6% reduction in carbon emissions for a scenario with that level of incremental wind (roughly 2 GW). The later years of our analysis also include declining imports; any increases in the levels of renewable resources from Canada will further displace gas-fired generation in New York.

Without considering incremental energy efficiency and new renewable resources, replacement power patterns demonstrate the near-term use of existing (and new) natural gas resources, and imports (generally, imports will be sourced from gas-fired resources in adjacent regions). As transmission is reinforced, upstate resources with lower operating costs than downstate resources substitute for downstate resources (wind, a zero-cost fuel resource, will always be dispatched before fossil-fired resources up to the point where transmission is constraining). In the near term, if energy efficiency and renewables are not able to be deployed in any significant amount, New York City gas generation makes up roughly one-fifth to one-quarter of replacement power needs, but this represents a smaller fractional increase in New York City zone J gas-fired generation: for example, in the scenario in which closed cycle cooling is installed in sequential year long outages in 2017 and 2018 (scenario 31) in 2017, zone J sees an 11% increase in gas-fired generation from 27.2 TWh to 30.3 TWh.[48]

If improvements in energy efficiency and deployment of renewable resources are considered, replacement power needs from gas-fired fuel are significantly lower. Over the longer-term, New York City (zone J) will not see increases in gas use beyond what will occur in a base case without increases in energy efficiency and renewable supplies. In all modeled cases, any oil use in New York City is limited to very-high-demand days, as annual levels of oil consumption remain extremely low (less than 0.05% of annual energy consumed in the state).

Price increases in the event of IPEC out-of-service are limited. Under all scenarios of higher levels of energy efficiency and renewable energy deployment, price increases are mitigated.

3. Reliability Assessment

Synapse assessed the likely reliability impacts of an Indian Point Energy Center dual-unit outage as of the summer of 2016.[49] Such an outage can arise from being offline for the construction of closed cycle cooling , being offline during the summer as a protective outage, or from a decision to permanently

[48] Model output by zone for gas, for zone J, scenarios 31 and 1.

[49] The reliability assessments reflected in the NYS PSC Contingency Plan docket focuses on ensuring reliability in the summer of 2016, the first year in which an IPEC outage might affect reliability. The resources that would be in place to meet 2016 needs would also be available in 2017 and later years, along with ongoing resource additions that would ensure reliability in those future years.

retire. Counsel for Riverkeeper has informed Synapse that Riverkeeper's position is that scenarios relating to shutdown of the facility in connection with NYSDEC April 2, 2010 Denial of Entergy's requested Clean Water Act Section 401 water quality certification is properly the subject of review under the NEPA in connection with the Entergy NRC license renewal proceeding rather than under the NYSDEC SEQRA review process. Accordingly, we analyzed the dual-outage scenario as a "worst case"/bounding scenario, and to help us to understand analytically how the system will respond to the loss of a large energy-supplying facility. Importantly, reliability is tested under extreme case scenarios, and our assessment does not reflect any particular outcome or mitigation approach for IPEC, but merely examines the assumptions already under consideration by the NY ISO (as reflected in the 2012 RNA) and the NYS PSC (in Case E-12-0503).

We conducted our reliability assessment by reviewing the most recent and most relevant materials available from the NYISO and from ongoing investigations before the New York PSC. The focus of our assessment was to determine if there is reasonable indication that New York electric power sector reliability would be maintained in 2016 under the circumstance where the IPEC units are offline in the summer of 2016. While the NYISO's 2012 Reliability Need Assessment (RNA) indicated reliability violations in 2016 if IPEC was out of service, it also indicated that roughly 1,000 MW of "compensatory MW" of capacity would be needed by 2016 to *preserve* reliability; more recently, the NYISO has confirmed that 1,100 MW of "replacement resources" need to be in place prior to a 2-unit IPEC outage.[50] The 2012 RNA did not include transmission, demand-side, and supply-side resources under development or existing as potentially available resources when computing the metrics that indicated a reliability violation if IPEC was out of service. The NYISO is scheduled to conduct its next Reliability Need Assessment in 2014. The capacity need indicated in the 2012 RNA and mentioned in the NYISO's September 2013 testimony is in the process of being developed, and it appears likely that it will be available by 2016. Thus, this assessment finds there is a reasonable indication that reliability will be maintained in 2016 even with outage of both units, since there is evidence of sufficient resource development that will allow for reliable operation.

The resource development activity is in the right locations in New York. It has come about through development of an Indian Point reliability contingency plan, and imminent electric capacity market construct changes in New York State. It includes NYS PSC-approved demand-side and transmission resources, and market-based development of new and potentially refurbished existing generation supply. Notably, much of the formal NYISO analysis (the 2012 RNA)—conducted in 2012 as part of the regular biennial cycle for reliability assessment—is based on 2012 data that excluded the presence of resources now projected to be in place by 2016. While updates to these analyses from NYISO are expected during 2014, it is not too early to conclude that Indian Point Energy Center reliability contingency plans and electric wholesale market developments will allow for reliable operation in New York in 2016. The primary basis for that conclusion is evidence of resource development that is directly

[50] Thomas Rumsey, NY ISO, testimony before the New York State Senate Energy and Telecommunications Committee, September 30, 2013.

targeted to mitigate reliability effects that might otherwise be seen if the IPEC units were to be out of service in 2016.

3.1. Reliability Overview

The New York State electric power system is an interconnected grid with hundreds of generation units providing roughly 38 Gigawatts (GW, equal to 1,000 MW) of summer capacity, and together with multiple GW of additional import capacity (from Quebec, Ontario, New England, and PJM) it supplies a varying demand that ranges roughly from a low of roughly 12 GW to a high of 33 GW.[51] Generation unit sizes vary, from less than 1 MW to more than 1,000 MW. A very hot summer day is generally the most stressful period for reliable operation, and is the period tested by the NYISO when assessing resource adequacy and transmission security of the electric power system.

Reliability is formally defined by the NYISO as having sufficient resource adequacy (essentially, high probability of sufficient supply to meet net demand on the highest load day) and sufficient transmission security (reliable operation even when confronted with the unexpected sequential loss of multiple transmission circuits during the time of highest peak load). The New York State Reliability Council oversees the reliability "rules of the road"[52] that must be adhered to by utilities and the NYISO, and these rules dictate the types of planning analyses conducted by the NYISO to evaluate reliability. For resource adequacy, reliability dictates a threshold level of computed probability of loss of load (no more than 1 day in 10 years). This is performed as part of the biennial RNA, and is also done each year as part of the Installed Reserve Margin (IRM) calculation used in specifying local capacity requirements in New York.[53] For transmission security, reliability requires secure operation for stressful system conditions when multiple transmission elements may be out of service. This is performed using power flow modeling techniques during the biannual RNA.

The NYISO assesses reliability of the New York State power system constantly for operational purposes, and at mostly regular intervals for planning purposes. In addition, the electric utilities in New York conduct their own reliability analyses. The NYISO's most recent planning assessment of reliability was contained in the 2012 Reliability Needs Assessment, produced as part of the Comprehensive Reliability Planning Process (CRPP). The CRPP also includes annual assessment of Resource Adequacy requirements for local areas, which contains the requirements for capacity for three separate local capacity zones, namely New York City, Long Island, and the rest of the State of New York. In 2014, an additional local

[51] NYISO 2013 Gold Book summer capacity total equals 37,920 MW. Peak load including losses and adjusted for weather in the summer of 2013 was 33,497.1 MW (NY ISO, "2013 Weather Normalized MW and Preliminary 2014 ICAP Forecast", Load Forecast Task Force presentation by Arthur Mancini, December 17, 2013). Low load figure from Figure A-11: Load Duration Curves for New York State, 2010-2012 (page A-16), from the 2012 State of the Market Report for the New York ISO Market, Potomac Economics, April 2013.

[52] New York State Reliability Council, NYSRC Reliability Rules for Planning and Operating the New York State Power System, Version 32, January 11, 2013.

[53] Local capacity requirements exist for the New York ISO zone J (New York City), the Long Island zone (K), and beginning in 2014, for the locality defined as the combination of NY ISO zones G, H, I and J.

capacity zone (comprised of the combination of the New York City zone J and the Lower Hudson Valley region zones G, H, and I) will be created to reflect recognition of the impact of a critical transmission constraint—the UPNY/SNEY (Upstate New York/Southeast New York)—on power flows in the region.

3.2. Status of IPEC Outage Contingency Plans

The status of reliability planning for the possible outage of IPEC indicates that reliability is not likely to be a major concern in 2016, as long as the planned improvements and anticipated market-based generation resources are deployed.

We summarize the most recently available, relevant information on the status of the reliability of the New York power system under an Indian Point summer 2016 outage, based on the NYS PSC proceeding on reliability contingency planning.[54] For the purpose of determining possible resource need, the contingency plans presume the outage of both IPEC units but the NYS PSC makes no determinations concerning any particular level of IPEC outage that may be in place by 2016.

The NYS PSC identifies[55] a 1,450 MW summer 2016 capacity need ("potential reliability need"[56]) requirement based on an earlier utility filing (ConEd and NYPA February 2013 IPEC Contingency Plan, see below), the NY ISO 2012 RNA, ConEd/NYPA's update to the 2012 RNA analysis, DPS Staff analysis, and the closure of the Danskammer plant (announced after the 2012 RNA). In the Order, which acts upon the ConEd/NYPA contingency plan filing, the Commission approves 185 MW of energy efficiency, demand response and combined heat and power resources that reduce the need, and anticipates a further 600 MW contribution[57] towards that need from three transmission projects (the "Transmission Owners Transmission Solutions," or TOTS) whose initial development costs were approved in this Order.

The TOTS projects are summarized in Table 16 below. Notably, all of the projects, both individually and in combination, contribute towards reducing the resource deficiency identified and described in the November 2013 NYS PSC Order on the IPEC Contingency Plan.

---

[54] The NYS PSC proceeding is characterized as Generation Retirement Contingency Plan. For purposes of our *reliability assessment*, we assumed the worst case outage considered by the NYISO—unavailability of the units in the summer of 2016. This does not imply that IPEC retires. Testing for reliability concerns presumes the units not available during the peak load periods in the summer, and such testing is blind to the reasons for the outage, and is not concerned with whether or not the units are back online during non-peak, non-summer periods. Our *emissions assessment* contains multiple scenarios of IPEC outages and accounts for different periods of outage at different times of the year, over the years 2015 through 2025. Those scenarios include both full retirement, and "partial outage" conditions such as would be seen with the construction and installation of closed cycle cooling.

[55] New York PSC Order on Contingency Plans, November 2013. Initiating Order and April 2013 Order in the IPEC Reliability Contingency Plan docket at the New York Public Service Commission. *Order Instituting Proceeding And Soliciting Indian Point Contingency Plan*, New York State Public Service Commission, Case 12-E-0503, November 30, 2012.

[56] Order, page 3 and pages 18-21.

[57] Order at 6, 22, and 24.

Table 16. Transmission Owner Transmission Solution (TOTS) Projects

TOTS Project Name	Description	In-Serv. Date	Effect on Reliability Need
2nd Ramapo to Rock Tavern	2nd 345 kV overhead circuit on existing right-of-way between Ramapo and Rock Tavern substations in Zone G.[58]	May 2016	Increase import capability into Southeastern New York, including NYC, during normal and emergency conditions and will provide partial solution for system reliability if IPEC retires. UPNY/ConEd interface limit increase of 1,425 MW (normal) and 2,780 MW (emergency). UPNY/SENY interface limit increase of 120 MW (normal) and 135 MW (emergency). Total East interface limit increase of 60 MW (normal) and 65 MW (emergency).[59] 100 MW reduction in N-1/-1 deficiency post-IPEC shutdown. In combination w/ MSSC, 480 MW reduction in N-1/-1 deficiency post-IPEC shutdown.
Marcy South Series Compensation and Fraser to Coopers Corner Reconductoring	Switchable series compensation on the 345 kV Marcy South transmission lines and reconductoring a section of the Fraser to Coopers Corner FCC-33 line.	June 1, 2016	Increase thermal transfer limits across Total East and the UPNY/SENY interface / provide partial solution for system reliability if IPEC retires.[60] Total East transfer limit increase of 444 MW[61], increases power flow from Zone E into Zones F and G.[62]
Staten Island Unbottling	Increase transmission capability between Gowanus, Goethals, and Farragut via forced cooling to increase thermal capacity. Reconfigure Goethals to Linden feeder (L&M legs).	May 2016	New resource that "unbottles" generation on Staten Island (zone J). Reduces N-1/-1 post IPEC shutdown deficiency by 440 MW. Partial solution to reliability needs if IPEC retires. Reduces severity of 2nd contingency violation in NYC. Increases transfer capability between Staten Island generation pocket and the rest of the 345 kV system in NYC. Allows greater access to PJM resources, expected to reduce dispatch of fossil generation in NYC and Long Island.[63]

[58] Three concurrent transmission upgrades will be completed. O&R feeder 28 (Ramapo 138 kV to Sugarloaf 138 kV) will be upgraded to 345 kV. Creation of Sugarloaf 345 kV station with 345/138 kV transformation. Install 345 kV line between Rock Tavern and Sugarloaf. Page 15, Exhibit C "Detailed Description of the Second Ramapo Rock Tavern 345 kV line," ConEd/NYPA compliance filing, February 1, 2013.

[59] Con Edison Company of New York, Additional Information on Transmission Owner Transmission Solution for Indian Point Contingency Plan, Second Ramapo to Rock Tavern 345 kV Line Project, May 20, 2013, pages 8-10.

[60] ConEd / NYPA Compliance Filing with respect to development of Indian Point Contingency Plan, Proceeding on Motion of the Commission To Review Generation Retirement Contingency Plan, Case 12-E-0503, Exhibit B, "Detailed Description of the Marcy South Series Compensation and Fraser to Coopers Corner Reconductoring Project, page 10. Filed February 1, 2013.

[61] Final Report of the System Impact Study for the MSSC project, NYISO queue #380.

[62] Submission of Comparable Information Pursuant to the April 19, 2013 Public Service Commission Order, Case 12-E-0503, Marcy South Series Compensation and Fraser to Coopers Corner Reconductoring Project, May 20, 2013.

[63] Consolidated Edison Company of New York, Additional Information on Transmission Owner Transmission Solution for Indian Point Contingency Plan: Staten Island Unbottling Project, May 20, 2013, Pages 6-12.

The result of these approvals leaves roughly a 665 MW shortfall in capacity needed to meet reliability requirements if IPEC was not available in the summer of 2016 (1,450 – 185 – 600 = 665 MW). The order notes the presence of approximately 1,500 MW of merchant generating units which have been "mothballed" or are "waiting to return to service if economic conditions improve," or "have been derated and require repair."[64] While the Order does not specifically state which units comprise that 1,500 MW, Synapse's review identifies four mothballed, derated, repair-requiring, or retired fossil-fueled units in the downstate or lower Hudson valley region that in total are roughly 1,528 MW: Astoria steam units 2 and 4 (177 MW and 376 MW, respectively); Bowline 2 (379 MW derated capacity); Astoria GT units 5, 7, 8, 12, and 13 (93.5); and Danskammer[65] 1-4 (503).[66] Excluding the retired Danskammer facility, the mothballed Astoria and derated portions of Bowline facilities combined include 1,025 MW of gas-fired capacity.

The Order also acknowledges the impending creation (beginning in 2014) of a new "Lower Hudson Valley" installed capacity zone in the NY ISO capacity market construct which can increase the revenues that would be available for the existing units to consider a return to service;[67] the new zone creation could also make it more likely that prospective new generation units in the LHV, namely the 678 MW (summer rating) CPV Valley plant, and the 1,020 MW (summer rating) Cricket Valley Energy Center would be constructed. The plants are currently listed with proposed in-service dates of May 2016 and January 2018, respectively.[68]

The NYS PSC Order did not approve, at that time, cost-based procurement of additional generation under the IPEC Reliability Contingency Plan. It notes that Con Edison and NYPA "should continue to monitor the status of projects which may enter or rejoin the generation market," and that those companies will need to assess if the IPEC Reliability Contingency Plan should expand the portfolio of resources (i.e., the TOTS projects and the energy efficiency, demand response and combined heat and power resources) to include other projects.[69]

---

[64] Order, page 7.

[65] Danskammer was damaged during Hurricane Sandy ("Hurricane Sandy: A Report from the New York Independent System Operator", March 27, 2013, page 23) though it was not operating at the time of the storm.

[66] 2013 Gold Book, CRIS values for Astoria 2 (p. 60), Astoria 4 (p. 59), and the difference between CRIS and summer MW values for Bowline 2 (557.4-177.9 = 379.5 MW) (p.34).

[67] The New York ISO and the New York ISO Market Monitor (Potomac Economics) have analyzed the effect of the impending new capacity zone and determined that it will substantially increase revenues available to capacity resources in the G-H-I zones. Entergy has also acknowledged the need for the new capacity zone to support new entry and capacity value in the region.

[68] NY ISO Interconnection Queue, January 2014.

[69] Order at p. 46.

In parallel with the IPEC Reliability Contingency Plan docket, the NYS PSC is essentially entertaining options for additional transmission resources,[70] to be provided by either the existing New York transmission companies (together as a "Transco" or joint-ownership transmission company) or new entrants to the field.[71] This proceeding has resulted in a filing by the NY Transco of an intention to construct not only the TOTS facilities (approved in the Contingency Plan docket) but also additional transmission facilities that will increase the transfer capability across the key upstate New York/southeastern New York (UPNY/SENY) interface and the related Central East and Total East interfaces in central New York.

Increased capacity across these interfaces will allow for increased flow of energy from upstate New York resources including new wind resources, to the downstate area. While the TOTS infrastructure in planned for in-service by the summer of 2016, additional reinforcement of the UPNY/SENY interface and related reinforcements would not be in service until later years, 2018 and 2019. While such improvements do not support reliability need for 2016, they would serve to help enable retirement of older capacity resources that might be in place during the period immediately after an IPEC shutdown. The proposals submitted by the new entrants are similar in overall effect as the NY Transco proposals, in that they propose to increase transmission capacity between upstate and downstate New York areas.

In a written statement provided to the Senate Energy and Telecommunications Committee, NYISO Vice President of External Affairs Thomas Rumsey stated that in order to meet reliability needs, 1,100 MW of "replacement resources" would need to be in place prior to IPEC closure.[72] He indicated that "likely potential solutions" would include new generation, additional demand response, and limited transmission upgrades.[73] He referenced the 552 MW of generation currently "mothballed" at the Astoria facility, and approximately 1,900 MW of proposed generation projects identifying a commercial

---

[70] E.g., 1) Order Instituting Proceeding. Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades. November 30, 2012. 2) Order Adopting Additional Procedures and Rule Changes for Review of Multiple Projects under Article VII of the Public Service Law, Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades, September 19, 2013. 3) Order Establishing Procedures for Joint Review Under Article VII of the Public Service Law and Approving Rule Changes, Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades, April 22, 2013. 4) New York Transco, Statement of Intent to Construct Transmission Facilities of Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc. / Orange & Rockland Utilities, Inc., Niagara Mohawk Power Corporation d/b/a National Grid, New York State Electric & Gas Corporation / Rochester Gas and Electric Corporation, New York Power Authority and the Long Island Power Authority on Behalf of the New York Transco, State of New York Public Service Commission Case 12-T-0502 – Proceeding on Motion to Examine Alternating Current Transmission Upgrades, Filed January 25, 2013. 5) New York Transco has also subsequently filed with the New York Public Service Commission, in Case 13-M-0457, "Submission of New York Transmission Owners for Authority To Construct and Operate Electric Transmission Facilities in Multiple Counties in New York, October 1, 2013. This filing describes the TOTS projects, and the additional 345 kV AC facilities (Edic to Pleasant Valley and the 2nd Oakdale to Fraser 345 kV transmission lines) planned for upstate New York.

[71] Transmission proposals include those from NextEra Energy Transmission, LLC; North America Transmission, LLC; Boundless Energy NE, LLC; and the New York Transco (comprised of the New York electric utilities).

[72] NY ISO Testimony before the NY Senate Energy and Telecommunications Committee, September 2013, reflecting the May 2013 Power Trends report; and the 2013 Power Trends Report.

[73] Written Statement of Thomas Rumsey, September 30, 2013, p. 8.

operation date in time for the summer of 2016.[74] While he did not explicitly identify the 1,900 MW of proposed generation projects, review of the information available on the NYISO generation interconnection queue indicates the following 2,400 MW of potential new projects in downstate zones (G or J) and potentially available by the summer of 2016, as seen in Table 17 below.

Table 17. New York ISO Generation Interconnection Queue, Downstate Zones, Summer 2016 Commercial Operation Date Indication (or earlier)

NYISO Queue Position	Plant Name	Summer MW	Fuel / Unit Type	County	NY ISO Zone	Connection Point	Utility	COD
251	CPV Valley Energy Center	678	CC-NG	Orange	G	Coopers – Rock Tavern 345kV	NYPA	2016/05
266	Berrians GT III	250	CC-NG	Queens	J	Astoria 345kV	NYPA	2016/06
349	Taylor Biomass	19	SW	Montgomery	G	Maybrook - Rock Tavern	CHGE	2015/12
361	Luyster Creek Energy	401	CC-D	Queens	J	Astoria West Substation 138kV	CONED	2015/06
382	South Pier Improvement	88	CT-NG	Kings	J	Gowanus Substation 138kV	ConEd	2015/07
383	Bowline Gen. Station Unit #3	775	CC-NG	Rockland	G	Ladentown Subsation 345kV	O&R/ ConEd	2016/06
400	Linden Cogen Uprate	208	CT-NG	Linden, NJ	J	Linden Cogen 345kV	ConEd	2016/Q2
	Total	2,419						

Note: NYISO Interconnection Queue data from January 2014.

The Power Trends report, from May 2013, stated "In addition, if the Indian Point Power Plant licenses are not renewed, and the plant were to retire by the end of 2015 or thereafter, this would result in immediate transmission security and resource adequacy criteria violations **unless sufficient replacement resources are in place prior to retirement**" (p19-20, emphasis added). In November 2012, the NY PSC asked Con Edison and the New York Power Authority to develop contingency plans to have resources in place in 2016 to address power supply needs in the event of Indian Point's closure (p36).

3.3. Outage Scenario Effect on Reliability

The planning for reliability undertaken by NYISO in the 2012 RNA, and undertaken by the NYS PSC in the Contingency Plan docket considers the extreme case that the IPEC plant is out of service (both units) in the summer of 2016. Reliability is a capacity-related concern. As long as sufficient, deliverable capacity resources are in place to mitigate reliability concerns under a situation where both units are modeled as out of service, then any combination of outage scenario will also be reliable – e.g., if any portion of

[74] Written Statement of Thomas Rumsey, September 30, 2013, p. 6.

either unit continues to be available in the summer of 2016, then operating reserve margins in the State will be even larger than they would be absent both units.

As long as sufficient capacity is in place, then different outage scenarios relating to the construction and installation of closed-cycle cooling at Indian Point will primarily impact estimates of replacement power and resulting emission patterns.

Given that sufficient replacement power will be adequate in the event that Indian Point goes fully offline permanently in 2016, it is reasonable to conclude that under *any* closed cycle cooling construction outage scenario, there will not be concerns with respect to reliability of the New York State electric system.

4. BIBLIOGRAPHY

ABB Inc. *System Impact Study for National Grid's Hudson Valley Reinforcement Project, (NYISO Queue Position Q#385).* Prepared for National Grid USA and New York Independent System Operator. June 19, 2013.

Con Edison. *Additional Information of Transmission Owner Transmission Solution for Indian Point Contingency Plan: Second Ramapo to Rock Tavern 345 kV Line Project.* State of New York Public Service Commission Case 12-E-0503 – Con Edison Filing of Supplemental Information Regarding its Ramapo to Rock Tavern Project. May 20, 2013.

——. *Additional Information of Transmission Owner Transmission Solution for Indian Point Contingency Plan: Staten Island Unbottling Project, Second Ramapo to Rock Tavern 345 kV Line Project.* State of New York Public Service Commission Case 12-E-0503 – Con Edison Filing of Supplemental Information Regarding its Staten Island Unbottling Project. May 20, 2013.

——. *System Impact Study for the Con Edison's Rock Tavern – Ramapo 345 kV Line 76 (NYISO Queue Position #368).* July 20, 2012.

Con Edison Transmission Planning Department. *The Long-Range Transmission Plan, 2013-2023.* September 23, 2013.

Con Edison and New York Power Authority. *Compliance Filing With Respect to Development of Indian Point Contingency Plan.* State of New York Public Service Commission Case 12-E-0503 – Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plan. February 1, 2013.

Con Edison, New York State Energy Research and Development Authority, and New York Power Authority. *Revised Indian Point Energy Center Demand Management Plan.* State of New York Public Service Commission Case 12-E-0503 – Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plan. June 19, 2013.

Federal Energy Regulatory Commission. Order approving New Capacity Zone, August 13, 2013. 144 FERC 61,126, Docket No. ER13-1380-000.

——. Order on New Capacity Zone Phase-in, January 28, 2014. 146 FERC 61,043, Docket No. ER14-500-000.

New York Independent System Operator. *2012 Comprehensive Reliability Plan.* March 2013.

——. *2012 Reliability Needs Assessment.* September 2012.

——. *2013 Load & Capacity Data, "Gold Book."* April 2013.

——. *2013 New Capacity Zone Study Report.* January 14, 2013.

——. *Growing Wind: Final Report of the NYISO 2010 Wind Generation Study*. September 2010.

——. *Power Trends 2013: Alternating Currents*. May 2013.

——. *Review of the System Impact Study for Con Edison Rock Tavern – Ramapo 345 kV Feeder 76 Project Interconnection Queue #368, August 1, 2012*. Report dated July 20, 2012.

——. *Review of the System Impact Study for National Grid's Hudson Valley Reinforcement Project, Interconnection Queue #385, July 18, 2013*. Report dated June 19, 2013.

——. *Review of the System Impact Study for NYPA Marcy South Series Compensation Project, Interconnection Queue #380, May 6, 2013*. Report dated April, 2013.

New York Independent System Operator Installed Capacity Working Group. *New Capacity Zone: Impact Analysis*. January 30, 2013.

——. *New Capacity Zone: Additional Impact Analysis*. March 28, 2013.

New York Independent System Operator, Vice President Thomas Rumsey, *Testimony before the New York State Energy and Telecommunications Committee*, September 30, 2013.

New York Power Authority. *System Impact Study for the Marcy-South Series Compensation Project (NYISO - Queue #380)*. April 2013.

New York Power Authority and New York State Electric & Gas Corporation. *Submission of Comparable Information Pursuant to the April 19, 2013 Public Service Commission Order*. State of New York Public Service Commission Case 12-E-0503 – Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project. May 20, 2013.

New York State Department of Environmental Conservation. *Department Staff Offer of Proof on Permanent Forced Outages/Seasonal Protective Outages*. November 12, 2013.

——. *State Environmental Quality Review, Findings Statement, CO_2 Budget Trading Program*. November 25, 2013.

New York State Reliability Council. *NYSRC Reliability Rules for Planning and Operating the New York State Power System, Version 32*. January 11, 2013.

New York State Reliability Council Installed Capacity Subcommittee. *Technical Study Report and Appendices: New York Control Area Installed Capacity Requirement for the Period May 2014 to April 2015*. December 6, 2013.

New York Transco. *Statement of Intent to Construct Transmission Facilities of Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc. / Orange & Rockland Utilities, Inc., Niagara Mohawk Power Corporation d/b/a National Grid, New York State Electric & Gas Corporation / Rochester Gas and Electric Corporation, New York Power Authority and the Long Island Power Authority on Behalf of the New York Transco*. State of New York Public

Service Commission Case 12-T-0502 – Proceeding on Motion to Examine Alternating Current Transmission Upgrades. Filed January 25, 2013.

New York Transmission Owners. *Submission of New York Transmission Owners for Authority To Construct and Operate Electric Transmission Facilities In Multiple Counties In New York.* State of New York Public Service Commission Case 13-M-0457 – Application of New York Transmission Owners Pursuant to Article VII for Authority to Construct and Operate Electric Transmission Facilities in Multiple Counties in New York State. October 1, 2013.

STARS Technical Working Group. *New York State Transmission Assessment and Reliability Study (STARS), Phase II Study Report.* April 30, 2012.

State of New York Public Service Commission. *Order Accepting IPEC Reliability Contingency Plans, Establishing Cost Allocation and Recovery, and Denying Request for Rehearing.* Case 12-E-0503, Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans. November 4, 2013.

——. *Order Adopting Additional Procedures and Rule Changes for Review of Multiple Projects under Article VII of the Public Service Law.* Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades. September 19, 2013.

——. *Order Establishing Energy Efficiency Portfolio and Approving Programs.* Case 07-M-0548 - Proceeding on Motion of the Commission Regarding an Energy Efficiency Portfolio. June 23, 2008.

——. *Order Establishing Procedures for Joint Review Under Article VII of the Public Service Law and Approving Rule Changes.* Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades. April 22, 2013.

——. *Order Instituting Proceeding.* Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades. November 30, 2012.

——. *Order Instituting Proceeding and Soliciting Indian Point Contingency Plan.* Case 12-E-0503, Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans. November 30, 2012.

——. *Order Upon Review of Plan to Advance Transmission, Energy Efficiency, and Demand Response Projects.* Case 12-E-0503, Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans. April 19, 2013.

——. *Petition of NYSERDA, NY-Sun 2016-2023 Funding Considerations and Other Program Implementation Considerations.* Case 03-E-0188 - Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard. January 6, 2014.

Synapse, PROSYM Modeling Analysis, 2014

Tetra Tech. *Indian Point Closed-Cycle Cooling System Retrofit Evaluation.* June 2013.

APPENDIX A: ADDITIONAL MODELING DATA TABLES

On the following pages, we present additional modeling data tables for:

- Energy Output by Zone by Scenario by Year by Fuel/Source
- Load by Zone, Base and High EE Scenarios

Scenario 1 - IPEC in base EE, Wind, PV	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	39,875	27,273	67,425	5,376	-	6	1	5,865	3,146	149,066
NY-AB (West)	4,151	14,891	1,928	4,924	-	-	-	1,072	828	27,793
NY-CDE (Cent North)	20,408	9,481	9,427	452	-	-	-	4,737	818	45,322
NY-F (Capital)	-	2,583	17,839	-	-	-	-	55	153	20,630
NY-GHI (Southeast)	15,417	318	746	-	-	-	-	-	535	17,016
NY-J (NY City)	-	-	25,909	-	-	-	-	-	54	25,964
NY-K (Long Island)	-	-	11,576	-	-	6	1	-	758	12,342
2016 Total All Zones	39,502	27,303	71,323	4,961	-	19	3	5,884	3,287	152,283
NY-AB (West)	4,487	14,897	1,886	4,527	-	-	-	1,077	831	27,704
NY-CDE (Cent North)	19,587	9,481	9,223	434	-	-	-	4,752	823	44,300
NY-F (Capital)	-	2,608	17,522	-	-	-	-	55	153	20,339
NY-GHI (Southeast)	15,428	318	4,269	-	-	0	-	-	535	20,550
NY-J (NY City)	-	-	26,837	-	-	2	-	-	182	27,021
NY-K (Long Island)	-	-	11,586	-	-	18	3	-	762	12,369
2017 Total All Zones	39,941	27,352	71,176	4,556	3	8	2	6,121	3,278	152,436
NY-AB (West)	4,113	14,894	1,794	4,129	-	-	-	1,071	829	26,830
NY-CDE (Cent North)	20,407	9,481	8,866	427	3	-	-	4,994	822	44,999
NY-F (Capital)	-	2,659	16,348	-	-	-	-	55	153	19,215
NY-GHI (Southeast)	15,421	318	5,854	-	-	-	-	-	533	22,126
NY-J (NY City)	-	-	27,176	-	-	0	-	-	184	27,361
NY-K (Long Island)	-	-	11,138	-	-	8	2	-	757	11,904
2018 Total All Zones	39,069	32,847	70,248	3,159	-	3	1	6,123	3,246	154,695
NY-AB (West)	4,149	14,870	1,619	2,761	-	-	-	1,071	820	25,791
NY-CDE (Cent North)	19,531	9,481	8,075	398	-	-	-	4,996	821	43,302
NY-F (Capital)	-	2,483	12,542	-	-	-	-	55	153	15,233
NY-GHI (Southeast)	15,388	318	12,568	-	-	-	-	-	532	28,807
NY-J (NY City)	-	5,694	24,914	-	-	-	-	-	167	30,775
NY-K (Long Island)	-	-	10,530	-	-	3	1	-	753	11,286
2019 Total All Zones	40,298	32,863	69,651	3,231	-	4	1	6,128	3,252	155,428
NY-AB (West)	4,474	14,878	1,603	2,832	-	-	-	1,072	826	25,685
NY-CDE (Cent North)	20,399	9,481	8,123	399	-	-	-	5,001	824	44,227
NY-F (Capital)	-	2,492	12,023	-	-	-	-	55	153	14,723
NY-GHI (Southeast)	15,425	318	12,505	-	-	-	-	-	532	28,781
NY-J (NY City)	-	5,694	24,779	-	-	-	-	-	166	30,639
NY-K (Long Island)	-	-	10,619	-	-	4	1	-	751	11,374
2020 Total All Zones	39,149	32,885	78,059	2,221	-	3	1	6,458	3,253	157,022
NY-AB (West)	4,126	14,882	1,588	1,864	-	-	-	1,077	828	24,358
NY-CDE (Cent North)	19,586	9,481	7,999	357	-	-	-	5,326	826	43,574
NY-F (Capital)	-	2,509	12,496	-	-	-	-	55	153	15,214
NY-GHI (Southeast)	15,436	318	15,321	-	-	-	-	-	533	31,609
NY-J (NY City)	-	5,694	25,132	-	-	-	-	-	165	30,991
NY-K (Long Island)	-	-	10,517	-	-	3	1	-	754	11,276
2021 Total All Zones	39,977	32,856	77,106	2,098	9	2	1	7,145	3,299	162,493
NY-AB (West)	4,151	14,875	1,574	1,753	-	-	-	1,315	821	24,489
NY-CDE (Cent North)	20,405	9,481	7,856	345	9	-	-	5,775	855	44,725
NY-F (Capital)	-	2,488	11,134	-	-	-	-	55	165	13,842
NY-GHI (Southeast)	15,422	318	17,985	-	-	-	-	-	532	34,257
NY-J (NY City)	-	5,694	26,141	-	-	-	-	-	170	32,005
NY-K (Long Island)	-	-	12,417	-	-	2	1	-	756	13,175
2022 Total All Zones	39,389	32,860	78,111	1,683	-	1	1	7,675	3,300	163,021
NY-AB (West)	4,475	14,877	1,517	1,350	-	-	-	1,539	818	24,576
NY-CDE (Cent North)	19,535	9,481	7,706	333	-	-	-	6,081	862	43,997
NY-F (Capital)	-	2,480	10,929	-	-	-	-	55	165	13,639
NY-GHI (Southeast)	15,379	318	17,841	-	-	-	-	-	532	34,071
NY-J (NY City)	-	5,694	27,789	-	-	-	-	-	168	33,651
NY-K (Long Island)	-	-	12,328	-	-	2	1	-	755	13,087
2023 Total All Zones	39,926	32,914	78,142	1,801	-	3	1	8,193	3,374	164,354
NY-AB (West)	4,114	14,884	1,507	1,464	-	-	-	1,536	819	24,324
NY-CDE (Cent North)	20,396	9,481	7,617	337	-	-	-	6,602	934	45,367
NY-F (Capital)	-	2,536	10,907	-	-	-	-	55	165	13,664
NY-GHI (Southeast)	15,416	318	17,970	-	-	-	-	-	532	34,235
NY-J (NY City)	-	5,694	27,818	-	-	-	-	-	166	33,678
NY-K (Long Island)	-	-	12,322	-	-	3	1	-	759	13,086
2024 Total All Zones	39,182	32,972	78,632	1,985	-	1	0	9,123	3,386	165,280
NY-AB (West)	4,162	14,887	1,508	1,639	-	-	-	1,544	818	24,558
NY-CDE (Cent North)	19,590	9,481	7,601	346	-	-	-	6,915	946	44,878
NY-F (Capital)	-	2,592	10,448	-	-	-	-	55	166	13,261
NY-GHI (Southeast)	15,430	318	17,447	-	-	-	-	-	533	33,728
NY-J (NY City)	-	5,694	27,279	-	-	-	-	-	165	33,138
NY-K (Long Island)	-	-	14,349	-	-	1	0	609	759	15,717
2025 Total All Zones	40,287	32,984	80,435	1,824	-	0	-	9,158	3,521	168,209
NY-AB (West)	4,473	14,896	1,494	1,485	-	-	-	1,539	810	24,697
NY-CDE (Cent North)	20,397	9,481	7,436	339	-	-	-	6,900	1,083	45,636
NY-F (Capital)	-	2,595	9,444	-	-	-	-	55	165	12,259
NY-GHI (Southeast)	15,417	318	16,477	-	-	-	-	-	531	32,744
NY-J (NY City)	-	5,694	29,069	-	-	-	-	55	165	34,983
NY-K (Long Island)	-	-	16,514	-	-	0	-	608	767	17,890

Scenario 11 - IPEC OOS base EE, Wind, PV	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	39,975	27,273	67,425	5,376	-	6	1	5,865	3,146	149,066
NY-AB (West)	4,151	14,891	1,928	4,924	-	-	-	1,072	828	27,793
NY-CDE (Cent North)	20,408	9,481	9,427	452	-	-	-	4,737	818	45,322
NY-F (Capital)	-	2,583	17,839	-	-	-	-	55	153	20,630
NY-GHI (Southeast)	15,417	318	746	-	-	-	-	-	535	17,016
NY-J (NY City)	-	-	25,909	-	-	-	-	-	54	25,964
NY-K (Long Island)	-	-	11,576	-	-	6	1	-	758	12,342
2016 Total All Zones	24,074	27,303	80,053	5,906	12	30	4	5,884	3,331	146,597
NY-AB (West)	4,487	14,897	2,177	5,436	-	-	-	1,077	837	28,910
NY-CDE (Cent North)	19,587	9,481	10,219	470	12	-	-	4,752	825	45,347
NY-F (Capital)	-	2,608	19,960	-	-	-	-	55	154	22,778
NY-GHI (Southeast)	-	318	5,350	-	-	1	-	-	550	6,218
NY-J (NY City)	-	-	29,916	-	-	2	-	-	199	30,117
NY-K (Long Island)	-	-	12,430	-	-	28	4	-	766	13,228
2017 Total All Zones	24,519	27,352	80,289	5,444	31	17	3	6,121	3,301	147,071
NY-AB (West)	4,113	14,894	2,058	4,987	-	-	-	1,071	835	27,957
NY-CDE (Cent North)	20,407	9,481	9,791	457	31	-	-	4,994	824	45,985
NY-F (Capital)	-	2,659	19,312	-	-	-	-	55	153	22,179
NY-GHI (Southeast)	-	318	6,995	-	-	0	-	-	542	7,855
NY-J (NY City)	-	-	30,257	-	-	1	-	-	188	30,446
NY-K (Long Island)	-	-	11,870	-	-	16	3	-	759	12,648
2018 Total All Zones	23,681	32,847	80,885	4,126	-	4	1	6,123	3,268	150,935
NY-AB (West)	4,149	14,870	1,774	3,699	-	-	-	1,071	827	26,391
NY-CDE (Cent North)	19,531	9,481	8,849	427	-	-	-	4,996	824	44,108
NY-F (Capital)	-	2,483	16,228	-	-	-	-	55	153	18,920
NY-GHI (Southeast)	-	318	14,591	-	-	-	-	-	537	15,446
NY-J (NY City)	-	5,694	28,536	-	-	-	-	-	172	34,403
NY-K (Long Island)	-	-	10,909	-	-	4	1	-	754	11,668
2019 Total All Zones	24,873	32,863	80,318	4,150	7	5	1	6,128	3,265	151,610
NY-AB (West)	4,474	14,878	1,780	3,722	-	-	-	1,072	833	26,760
NY-CDE (Cent North)	20,399	9,481	8,865	428	7	-	-	5,001	828	45,007
NY-F (Capital)	-	2,492	15,819	-	-	-	-	55	153	18,520
NY-GHI (Southeast)	-	318	14,504	-	-	-	-	-	533	15,355
NY-J (NY City)	-	5,694	28,357	-	-	-	-	-	166	34,217
NY-K (Long Island)	-	-	10,992	-	-	5	1	-	752	11,750
2020 Total All Zones	23,719	32,885	83,767	3,008	-	4	1	6,458	3,264	153,100
NY-AB (West)	4,126	14,882	1,749	2,623	-	-	-	1,077	828	25,285
NY-CDE (Cent North)	19,586	9,481	8,791	385	-	-	-	5,326	829	44,399
NY-F (Capital)	-	2,509	16,557	-	-	-	-	55	154	19,275
NY-GHI (Southeast)	-	318	17,568	-	-	-	-	-	534	18,420
NY-J (NY City)	-	5,694	28,239	-	-	-	-	-	165	34,099
NY-K (Long Island)	-	-	10,863	-	-	4	1	-	754	11,622
2021 Total All Zones	24,555	32,856	87,699	2,814	10	3	1	7,145	3,310	158,392
NY-AB (West)	4,151	14,875	1,678	2,442	-	-	-	1,315	828	25,288
NY-CDE (Cent North)	20,405	9,481	8,574	373	10	-	-	5,775	858	45,475
NY-F (Capital)	-	2,488	15,099	-	-	-	-	55	166	17,808
NY-GHI (Southeast)	-	318	20,139	-	-	-	-	-	532	20,990
NY-J (NY City)	-	5,694	29,431	-	-	0	-	-	170	35,295
NY-K (Long Island)	-	-	12,777	-	-	2	1	-	756	13,537
2022 Total All Zones	24,010	32,860	88,778	2,397	-	2	0	7,675	3,312	159,036
NY-AB (West)	4,475	14,877	1,619	2,034	-	-	-	1,539	826	25,370
NY-CDE (Cent North)	19,535	9,481	8,381	363	-	-	-	6,081	864	44,705
NY-F (Capital)	-	2,490	14,662	-	-	-	-	55	166	17,373
NY-GHI (Southeast)	-	318	20,076	-	-	-	-	-	532	20,927
NY-J (NY City)	-	5,694	31,337	-	-	-	-	-	169	37,199
NY-K (Long Island)	-	-	12,704	-	-	2	0	-	755	13,461
2023 Total All Zones	24,510	32,914	88,475	2,655	6	5	1	8,193	3,386	160,146
NY-AB (West)	4,114	14,884	1,598	2,290	-	-	-	1,536	827	25,249
NY-CDE (Cent North)	20,396	9,481	8,259	365	6	-	-	6,602	937	46,046
NY-F (Capital)	-	2,536	14,526	-	-	-	-	55	166	17,283
NY-GHI (Southeast)	-	318	20,023	-	-	-	-	-	533	20,873
NY-J (NY City)	-	5,694	31,381	-	-	-	-	-	165	37,240
NY-K (Long Island)	-	-	12,689	-	-	5	1	-	759	13,454
2024 Total All Zones	23,752	32,972	88,971	2,799	-	1	0	9,123	3,399	161,017
NY-AB (West)	4,162	14,887	1,584	2,432	-	-	-	1,544	825	25,435
NY-CDE (Cent North)	19,590	9,481	8,156	367	-	-	-	6,915	950	45,459
NY-F (Capital)	-	2,592	14,025	-	-	-	-	55	166	16,839
NY-GHI (Southeast)	-	318	19,786	-	-	-	-	-	534	20,638
NY-J (NY City)	-	5,694	30,534	-	-	-	-	-	165	36,393
NY-K (Long Island)	-	-	14,885	-	-	1	0	609	759	16,253
2025 Total All Zones	24,870	32,984	91,211	2,341	9	0	-	9,158	3,542	164,115
NY-AB (West)	4,473	14,896	1,567	1,982	-	-	-	1,539	819	25,277
NY-CDE (Cent North)	20,397	9,481	7,945	359	9	-	-	6,900	1,093	46,184
NY-F (Capital)	-	2,595	12,403	-	-	-	-	55	166	15,218
NY-GHI (Southeast)	-	318	18,995	-	-	-	-	-	532	19,846
NY-J (NY City)	-	5,694	33,144	-	-	-	-	55	165	39,058
NY-K (Long Island)	-	-	17,157	-	-	0	-	608	767	18,533

Scenario 12 - IPEC OOS Hi Wind		Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
	2015 Total All Zones	39,975	27,273	67,425	5,376	-	6	1	5,865	3,146	149,066
NY-AB (West)		4,151	14,891	1,928	4,924	-	-	-	1,072	828	27,793
NY-CDE (Cent North)		20,408	9,481	9,427	452	-	-	-	4,737	818	45,322
NY-F (Capital)		-	2,583	17,839	-	-	-	-	55	153	20,630
NY-GHI (Southeast)		15,417	318	746	-	-	-	-	-	535	17,016
NY-J (NY City)		-	-	25,909	-	-	-	-	-	54	25,964
NY-K (Long Island)		-	-	11,576	-	-	6	1	-	758	12,342
	2016 Total All Zones	24,074	27,303	80,053	3,906	12	30	4	5,884	3,331	144,597
NY-AB (West)		4,487	14,897	2,177	5,436	-	-	-	1,077	837	28,910
NY-CDE (Cent North)		19,587	9,481	10,219	470	12	-	-	4,752	825	45,347
NY-F (Capital)		-	2,608	19,960	-	-	-	-	55	154	22,778
NY-GHI (Southeast)		-	318	5,350	-	-	1	-	-	550	6,218
NY-J (NY City)		-	-	29,916	-	-	2	-	-	199	30,117
NY-K (Long Island)		-	-	12,430	-	-	28	4	-	766	13,228
	2017 Total All Zones	24,519	27,352	80,283	5,444	31	17	3	6,121	3,301	147,071
NY-AB (West)		4,113	14,894	2,058	4,987	-	-	-	1,071	835	27,957
NY-CDE (Cent North)		20,407	9,481	9,791	457	31	-	-	4,994	824	45,985
NY-F (Capital)		-	2,659	19,312	-	-	-	-	55	153	22,179
NY-GHI (Southeast)		-	318	6,995	-	-	0	-	-	542	7,855
NY-J (NY City)		-	-	30,257	-	-	1	-	-	188	30,446
NY-K (Long Island)		-	-	11,870	-	-	16	3	-	759	12,648
	2018 Total All Zones	23,681	32,847	80,128	4,087	-	4	1	7,265	3,263	151,277
NY-AB (West)		4,149	14,872	1,749	3,564	-	-	-	1,459	825	26,719
NY-CDE (Cent North)		19,531	9,481	8,765	423	-	-	-	5,731	822	44,753
NY-F (Capital)		-	2,482	15,953	-	-	-	-	75	153	18,663
NY-GHI (Southeast)		-	318	14,526	-	-	-	-	-	537	15,381
NY-J (NY City)		-	5,694	28,267	-	-	-	-	-	172	34,133
NY-K (Long Island)		-	-	10,867	-	-	4	1	-	754	11,627
	2019 Total All Zones	24,873	32,869	78,831	3,954	4	5	1	8,419	3,261	152,215
NY-AB (West)		4,474	14,877	1,746	3,530	-	-	-	1,850	830	27,308
NY-CDE (Cent North)		20,399	9,481	8,781	424	4	-	-	6,475	826	46,389
NY-F (Capital)		-	2,498	15,369	-	-	-	-	95	153	18,116
NY-GHI (Southeast)		-	318	14,316	-	-	-	-	-	533	15,167
NY-J (NY City)		-	5,694	27,694	-	-	0	-	-	166	33,554
NY-K (Long Island)		-	-	10,924	-	-	5	1	-	752	11,682
	2020 Total All Zones	23,713	32,896	81,470	2,854	-	4	1	9,907	3,260	154,105
NY-AB (West)		4,126	14,885	1,693	2,475	-	-	-	2,248	824	26,252
NY-CDE (Cent North)		19,586	9,481	8,606	379	-	-	-	7,544	828	46,423
NY-F (Capital)		-	2,519	15,642	-	-	-	-	115	154	18,429
NY-GHI (Southeast)		-	318	17,243	-	-	-	-	-	534	18,096
NY-J (NY City)		-	5,694	27,507	-	-	-	-	-	165	33,366
NY-K (Long Island)		-	-	10,779	-	-	4	1	-	754	11,539
	2021 Total All Zones	24,555	32,878	84,675	2,635	10	2	1	11,740	3,302	159,798
NY-AB (West)		4,151	14,878	1,630	2,273	-	-	-	2,875	824	26,629
NY-CDE (Cent North)		20,405	9,481	8,367	362	10	-	-	8,730	855	48,210
NY-F (Capital)		-	2,507	13,854	-	-	-	-	135	165	16,662
NY-GHI (Southeast)		-	318	19,729	-	-	-	-	-	532	20,580
NY-J (NY City)		-	5,694	28,417	-	-	-	-	-	170	34,281
NY-K (Long Island)		-	-	12,677	-	-	2	1	-	756	13,436
	2022 Total All Zones	24,010	32,899	85,011	1,976	-	2	1	13,416	3,302	160,616
NY-AB (West)		4,475	14,887	1,565	1,624	-	-	-	3,488	820	26,859
NY-CDE (Cent North)		19,535	9,481	8,134	352	-	-	-	9,773	860	48,134
NY-F (Capital)		-	2,520	13,211	-	-	-	-	155	166	16,051
NY-GHI (Southeast)		-	318	19,467	-	-	-	-	-	532	20,317
NY-J (NY City)		-	5,694	30,070	-	-	-	-	-	168	35,932
NY-K (Long Island)		-	-	12,565	-	-	2	1	-	756	13,324
	2023 Total All Zones	24,510	32,944	84,127	2,194	6	4	1	15,052	3,371	162,210
NY-AB (West)		4,114	14,888	1,535	1,844	-	-	-	3,864	818	27,064
NY-CDE (Cent North)		20,396	9,481	7,930	350	6	-	-	11,013	930	50,106
NY-F (Capital)		-	2,563	12,980	-	-	-	-	174	166	15,883
NY-GHI (Southeast)		-	318	19,388	-	-	-	-	-	532	20,238
NY-J (NY City)		-	5,694	29,748	-	-	-	-	-	165	35,608
NY-K (Long Island)		-	-	12,547	-	-	4	1	-	759	13,311
	2024 Total All Zones	23,752	33,008	83,737	2,414	-	1	0	17,167	3,376	163,455
NY-AB (West)		4,162	14,889	1,529	2,058	-	-	-	4,275	814	27,727
NY-CDE (Cent North)		19,590	9,481	7,861	356	-	-	-	12,088	939	50,313
NY-F (Capital)		-	2,625	11,970	-	-	-	-	195	166	14,956
NY-GHI (Southeast)		-	318	18,815	-	-	-	-	-	534	19,667
NY-J (NY City)		-	5,694	28,945	-	-	-	-	-	165	34,804
NY-K (Long Island)		-	-	14,624	-	-	1	0	609	759	15,993
	2025 Total All Zones	24,870	33,039	85,350	1,940	3	0	-	18,350	3,504	167,056
NY-AB (West)		4,473	14,901	1,903	1,586	-	-	-	4,659	804	27,935
NY-CDE (Cent North)		20,397	9,481	7,606	344	3	-	-	12,812	1,070	51,714
NY-F (Capital)		-	2,645	10,780	-	-	-	-	215	166	13,806
NY-GHI (Southeast)		-	318	18,004	-	-	-	-	-	532	18,854
NY-J (NY City)		-	5,694	30,671	-	-	-	-	55	165	36,585
NY-K (Long Island)		-	-	16,787	-	-	0	-	608	767	18,162

Scenario 13 - IPEC OOS HI EE		Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
	2015 Total All Zones	39,975	27,387	63,851	4,774	-	3	0	5,864	3,092	144,948
NY-AB (West)		4,151	14,903	1,771	4,349	-	-	-	1,072	812	27,058
NY-CDE (Cent North)		20,408	9,481	8,915	426	-	-	-	4,737	805	44,772
NY-F (Capital)		-	2,688	16,306	-	-	-	-	55	152	19,199
NY-GHI (Southeast)		15,417	318	374	-	-	-	-	-	538	16,642
NY-J (NY City)		-	-	25,830	-	-	-	-	-	39	25,869
NY-K (Long Island)		-	-	10,654	-	-	3	0	-	751	11,409
	2016 Total All Zones	24,074	27,383	76,738	5,221	-	17	3	5,884	3,275	142,594
NY-AB (West)		4,487	14,908	1,977	4,786	-	-	-	1,077	821	28,057
NY-CDE (Cent North)		19,587	9,481	9,621	435	-	-	-	4,752	814	44,690
NY-F (Capital)		-	2,675	18,524	-	-	-	-	55	154	21,409
NY-GHI (Southeast)		-	318	4,751	-	-	0	-	-	543	5,612
NY-J (NY City)		-	-	30,544	-	-	1	-	-	184	30,729
NY-K (Long Island)		-	-	11,321	-	-	15	3	-	758	12,098
	2017 Total All Zones	24,519	27,416	76,645	4,548	3	7	1	6,120	3,271	142,532
NY-AB (West)		4,113	14,904	1,881	4,119	-	-	-	1,071	824	26,911
NY-CDE (Cent North)		20,407	9,481	9,241	430	3	-	-	4,994	816	45,372
NY-F (Capital)		-	2,714	17,716	-	-	-	-	55	153	20,638
NY-GHI (Southeast)		-	318	6,322	-	-	0	-	-	540	7,181
NY-J (NY City)		-	-	30,573	-	-	-	-	-	181	30,754
NY-K (Long Island)		-	-	10,912	-	-	7	1	-	756	11,677
	2018 Total All Zones	23,681	32,856	75,392	3,637	-	3	1	6,122	3,236	144,927
NY-AB (West)		4,149	14,874	1,665	3,229	-	-	-	1,071	816	25,805
NY-CDE (Cent North)		19,531	9,481	8,484	408	-	-	-	4,996	816	43,715
NY-F (Capital)		-	2,489	14,666	-	-	-	-	55	153	17,363
NY-GHI (Southeast)		-	318	14,038	-	-	-	-	-	533	14,890
NY-J (NY City)		-	5,694	26,292	-	-	-	-	-	165	32,151
NY-K (Long Island)		-	-	10,248	-	-	3	1	-	752	11,003
	2019 Total All Zones	24,873	32,847	75,009	3,647	-	2	-	6,128	3,259	145,758
NY-AB (West)		4,474	14,875	1,689	3,229	-	-	-	1,072	827	26,166
NY-CDE (Cent North)		20,399	9,481	8,603	418	-	-	-	5,001	824	44,726
NY-F (Capital)		-	2,479	14,343	-	-	-	-	55	153	17,030
NY-GHI (Southeast)		-	318	13,876	-	-	-	-	-	533	14,727
NY-J (NY City)		-	5,694	26,116	-	-	-	-	-	165	31,975
NY-K (Long Island)		-	-	10,382	-	-	2	-	-	751	11,135
	2020 Total All Zones	23,713	32,821	78,760	2,659	-	2	0	6,458	3,257	147,670
NY-AB (West)		4,126	14,876	1,665	2,284	-	-	-	1,077	824	24,852
NY-CDE (Cent North)		19,586	9,481	8,511	375	-	-	-	5,326	828	44,107
NY-F (Capital)		-	2,452	15,006	-	-	-	-	55	154	17,667
NY-GHI (Southeast)		-	318	16,940	-	-	-	-	-	534	17,792
NY-J (NY City)		-	5,694	26,384	-	-	-	-	-	165	32,243
NY-K (Long Island)		-	-	10,254	-	-	2	0	-	753	11,009
	2021 Total All Zones	24,555	32,836	83,106	2,529	-	1	0	7,145	3,300	153,472
NY-AB (West)		4,151	14,879	1,627	2,165	-	-	-	1,315	825	24,960
NY-CDE (Cent North)		20,405	9,481	8,370	364	-	-	-	5,775	856	45,251
NY-F (Capital)		-	2,465	13,640	-	-	-	-	55	165	16,326
NY-GHI (Southeast)		-	318	19,513	-	-	-	-	-	532	20,868
NY-J (NY City)		-	5,694	27,679	-	-	-	-	-	166	33,539
NY-K (Long Island)		-	-	12,276	-	-	1	0	-	756	13,034
	2022 Total All Zones	24,010	32,890	84,340	1,997	-	1	-	7,674	3,303	154,215
NY-AB (West)		4,475	14,886	1,573	1,644	-	-	-	1,538	823	24,941
NY-CDE (Cent North)		19,535	9,481	8,197	353	-	-	-	6,081	863	44,509
NY-F (Capital)		-	2,510	13,339	-	-	-	-	55	166	16,070
NY-GHI (Southeast)		-	318	19,377	-	-	-	-	-	532	20,227
NY-J (NY City)		-	5,694	29,681	-	-	-	-	-	165	35,540
NY-K (Long Island)		-	-	12,173	-	-	1	-	-	754	12,928
	2023 Total All Zones	24,510	32,908	84,153	2,236	3	1	0	8,193	3,379	155,384
NY-AB (West)		4,114	14,886	1,547	1,879	-	-	-	1,536	824	24,786
NY-CDE (Cent North)		20,396	9,481	8,071	357	3	-	-	6,602	935	45,845
NY-F (Capital)		-	2,530	13,405	-	-	-	-	55	166	16,155
NY-GHI (Southeast)		-	318	19,318	-	-	-	-	-	532	20,169
NY-J (NY City)		-	5,694	29,647	-	-	-	-	-	165	35,505
NY-K (Long Island)		-	-	12,165	-	-	1	0	-	757	12,924
	2024 Total All Zones	23,732	32,940	84,515	2,410	-	0	-	9,122	3,393	156,133
NY-AB (West)		4,162	14,885	1,545	2,049	-	-	-	1,544	822	25,006
NY-CDE (Cent North)		19,590	9,481	8,016	362	-	-	-	6,914	948	45,311
NY-F (Capital)		-	2,562	12,605	-	-	-	-	55	166	15,388
NY-GHI (Southeast)		-	318	18,994	-	-	-	-	-	534	19,845
NY-J (NY City)		-	5,694	28,960	-	-	-	-	-	165	34,819
NY-K (Long Island)		-	-	14,396	-	-	0	-	609	758	15,763
	2025 Total All Zones	24,870	32,913	86,710	2,025	-	0	-	9,158	3,532	159,207
NY-AB (West)		4,473	14,888	1,523	1,674	-	-	-	1,539	814	24,911
NY-CDE (Cent North)		20,397	9,481	7,743	351	-	-	-	6,900	1,088	45,960
NY-F (Capital)		-	2,532	11,298	-	-	-	-	55	166	14,051
NY-GHI (Southeast)		-	318	18,198	-	-	-	-	-	532	19,049
NY-J (NY City)		-	5,694	31,306	-	-	-	-	55	165	37,221
NY-K (Long Island)		-	-	16,641	-	-	0	-	608	767	18,016

Scenario 14 - IPEC OOS HI EE, Wind, PV	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	**39,975**	**27,317**	**62,171**	**4,913**	**-**	**4**	**0**	**5,865**	**4,035**	**144,781**
NY-AB (West)	4,151	14,895	1,787	4,485	-	-	-	1,072	1,008	27,397
NY-CDE (Cent North)	20,408	9,481	8,924	428	-	-	-	4,737	1,001	44,978
NY-F (Capital)	-	2,624	16,488	-	-	-	-	55	348	19,515
NY-GHI (Southeast)	15,417	318	415	-	-	-	-	-	627	16,776
NY-J (NY City)	-	-	23,784	-	-	-	-	-	137	23,921
NY-K (Long Island)	-	-	10,774	-	-	4	0	-	914	11,693
2016 Total All Zones	**24,074**	**27,298**	**77,256**	**520**	**-**	**20**	**3**	**5,884**	**4,708**	**139,765**
NY-AB (West)	4,487	14,899	2,223	64	-	-	-	1,077	1,136	23,887
NY-CDE (Cent North)	19,587	9,481	10,140	456	-	-	-	4,752	1,124	45,540
NY-F (Capital)	-	2,600	19,462	-	-	-	-	55	461	22,578
NY-GHI (Southeast)	-	318	5,133	-	-	1	-	-	688	6,140
NY-J (NY City)	-	-	28,441	-	-	1	-	-	328	28,771
NY-K (Long Island)	-	-	11,856	-	-	18	3	-	971	12,849
2017 Total All Zones	**24,519**	**27,307**	**76,749**	**493**	**3**	**9**	**1**	**6,121**	**5,167**	**140,369**
NY-AB (West)	4,113	14,894	2,067	52	-	-	-	1,071	1,245	23,441
NY-CDE (Cent North)	20,407	9,481	9,599	441	3	-	-	4,994	1,235	46,160
NY-F (Capital)	-	2,615	18,495	-	-	-	-	55	569	21,734
NY-GHI (Southeast)	-	318	6,676	-	-	0	-	-	729	7,723
NY-J (NY City)	-	-	28,678	-	-	0	-	-	373	29,052
NY-K (Long Island)	-	-	11,234	-	-	8	1	-	1,015	12,259
2018 Total All Zones	**23,681**	**32,775**	**74,950**	**435**	**-**	**3**	**1**	**7,265**	**5,577**	**144,688**
NY-AB (West)	4,149	14,868	1,739	26	-	-	-	1,459	1,339	23,577
NY-CDE (Cent North)	19,531	9,481	8,554	409	-	-	-	5,731	1,338	45,043
NY-F (Capital)	-	2,418	14,376	-	-	-	-	75	678	17,547
NY-GHI (Southeast)	-	318	13,992	-	-	-	-	-	768	15,078
NY-J (NY City)	-	5,694	26,132	-	-	-	-	-	400	32,226
NY-K (Long Island)	-	-	10,157	-	-	3	1	-	1,054	11,215
2019 Total All Zones	**24,873**	**32,760**	**73,570**	**434**	**-**	**2**	**-**	**8,419**	**6,057**	**146,114**
NY-AB (West)	4,474	14,866	1,726	24	-	-	-	1,850	1,457	24,397
NY-CDE (Cent North)	20,399	9,481	8,566	410	-	-	-	6,475	1,455	46,785
NY-F (Capital)	-	2,401	13,577	-	-	-	-	95	786	16,859
NY-GHI (Southeast)	-	318	13,809	-	-	-	-	-	814	14,941
NY-J (NY City)	-	5,694	25,713	-	-	-	-	-	446	31,853
NY-K (Long Island)	-	-	10,180	-	-	2	-	-	1,098	11,279
2020 Total All Zones	**23,713**	**32,726**	**75,265**	**371**	**-**	**1**	**-**	**9,907**	**6,535**	**148,618**
NY-AB (West)	4,126	14,855	1,669	4	-	-	-	2,248	1,563	24,465
NY-CDE (Cent North)	19,586	9,481	8,340	367	-	-	-	7,544	1,569	46,887
NY-F (Capital)	-	2,378	13,501	-	-	-	-	115	898	16,893
NY-GHI (Southeast)	-	318	16,897	-	-	-	-	-	863	17,579
NY-J (NY City)	-	5,694	25,937	-	-	-	-	-	494	31,525
NY-K (Long Island)	-	-	10,021	-	-	1	-	-	1,148	11,170
2021 Total All Zones	**24,555**	**32,730**	**78,518**	**353**	**-**	**1**	**0**	**11,740**	**7,051**	**154,949**
NY-AB (West)	4,151	14,854	1,618	0	-	-	-	2,875	1,674	25,171
NY-CDE (Cent North)	20,405	9,481	8,062	352	-	-	-	8,730	1,708	48,737
NY-F (Capital)	-	2,383	12,000	-	-	-	-	135	1,022	15,540
NY-GHI (Southeast)	-	318	18,748	-	-	-	-	-	909	19,975
NY-J (NY City)	-	5,694	26,177	-	-	-	-	-	543	32,414
NY-K (Long Island)	-	-	11,913	-	-	1	0	-	1,196	13,111
2022 Total All Zones	**24,012**	**32,749**	**78,202**	**332**	**-**	**1**	**-**	**13,415**	**7,517**	**156,229**
NY-AB (West)	4,475	14,853	1,553	-	-	-	-	3,488	1,777	26,146
NY-CDE (Cent North)	19,537	9,481	7,823	332	-	-	-	9,773	1,822	48,767
NY-F (Capital)	-	2,402	11,219	-	-	-	-	155	1,132	14,908
NY-GHI (Southeast)	-	318	18,183	-	-	-	-	-	957	19,458
NY-J (NY City)	-	5,694	27,668	-	-	-	-	-	589	33,952
NY-K (Long Island)	-	-	11,756	-	-	1	-	-	1,241	12,998
2023 Total All Zones	**24,510**	**32,785**	**77,227**	**339**	**-**	**1**	**0**	**15,051**	**8,050**	**158,012**
NY-AB (West)	4,114	14,859	1,529	1	-	-	-	3,864	1,883	26,250
NY-CDE (Cent North)	20,396	9,481	7,658	338	-	-	-	11,012	2,000	50,885
NY-F (Capital)	-	2,432	10,896	-	-	-	-	174	1,241	14,743
NY-GHI (Southeast)	-	318	18,336	-	-	-	-	-	1,003	19,659
NY-J (NY City)	-	5,694	27,159	-	-	-	-	-	636	33,489
NY-K (Long Island)	-	-	11,699	-	-	1	0	-	1,288	12,988
2024 Total All Zones	**23,752**	**32,810**	**77,003**	**341**	**-**	**-**	**-**	**17,165**	**8,036**	**159,106**
NY-AB (West)	4,162	14,858	1,519	-	-	-	-	4,275	1,871	26,686
NY-CDE (Cent North)	19,590	9,481	7,565	341	-	-	-	12,086	2,002	51,065
NY-F (Capital)	-	2,459	10,269	-	-	-	-	195	1,238	14,161
NY-GHI (Southeast)	-	318	17,548	-	-	-	-	-	1,003	18,869
NY-J (NY City)	-	5,694	26,267	-	-	-	-	-	635	32,595
NY-K (Long Island)	-	-	13,835	-	-	-	-	609	1,287	15,731
2025 Total All Zones	**24,870**	**32,804**	**78,012**	**330**	**-**	**-**	**-**	**18,341**	**8,152**	**162,510**
NY-AB (West)	4,473	14,856	1,479	-	-	-	-	4,657	1,862	27,327
NY-CDE (Cent North)	20,397	9,481	7,356	330	-	-	-	12,806	2,129	52,499
NY-F (Capital)	-	2,455	9,037	-	-	-	-	215	1,238	12,945
NY-GHI (Southeast)	-	318	16,331	-	-	-	-	-	1,002	17,652
NY-J (NY City)	-	5,694	27,761	-	-	-	-	55	634	34,144
NY-K (Long Island)	-	-	16,049	-	-	-	-	608	1,285	17,942

Scenario 31 - IPEC 2 Seq. Years base	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	39,975	27,279	87,425	5,376	-	6	1	5,865	3,146	149,066
NY-AB (West)	4,151	14,891	1,928	4,924	-	-	-	1,072	828	27,793
NY-CDE (Cent North)	20,408	9,481	9,427	452	-	-	-	4,737	818	45,322
NY-F (Capital)	-	2,583	17,839	-	-	-	-	55	153	20,630
NY-GHI (Southeast)	15,417	318	746	-	-	-	-	-	535	17,016
NY-J (NY City)	-	-	25,909	-	-	-	-	-	54	25,964
NY-K (Long Island)	-	-	11,576	-	-	6	1	-	758	12,342
2016 Total All Zones	37,299	27,303	72,705	5,019	6	25	4	5,884	3,317	151,562
NY-AB (West)	4,487	14,897	1,916	4,578	-	-	-	1,077	832	27,787
NY-CDE (Cent North)	19,587	9,481	9,344	442	6	-	-	4,752	823	44,434
NY-F (Capital)	-	2,608	17,842	-	-	-	-	55	153	20,659
NY-GHI (Southeast)	13,224	318	4,652	-	-	0	-	-	545	18,740
NY-J (NY City)	-	-	27,299	-	-	2	-	-	198	27,493
NY-K (Long Island)	-	-	11,658	-	-	23	4	-	765	12,450
2017 Total All Zones	31,062	27,352	76,578	4,912	24	16	2	6,121	3,298	149,364
NY-AB (West)	4,113	14,894	1,958	4,468	-	-	-	1,071	833	27,337
NY-CDE (Cent North)	20,407	9,481	9,446	444	24	-	-	4,994	823	45,618
NY-F (Capital)	-	2,659	18,165	-	-	-	-	55	153	21,032
NY-GHI (Southeast)	6,543	318	6,603	-	-	0	-	-	541	14,006
NY-J (NY City)	-	-	28,913	-	-	1	-	-	188	29,102
NY-K (Long Island)	-	-	11,493	-	-	15	2	-	759	12,270
2018 Total All Zones	31,110	32,847	75,703	3,758	-	3	1	6,123	3,256	152,800
NY-AB (West)	4,149	14,870	1,679	3,346	-	-	-	1,071	824	25,940
NY-CDE (Cent North)	19,531	9,481	8,455	412	-	-	-	4,996	823	43,698
NY-F (Capital)	-	2,683	14,384	-	-	-	-	55	153	17,075
NY-GHI (Southeast)	7,429	318	13,851	-	-	-	-	-	534	22,132
NY-J (NY City)	-	5,694	26,636	-	-	-	-	-	169	32,499
NY-K (Long Island)	-	-	10,698	-	-	3	1	-	753	11,456
2019 Total All Zones	39,672	32,863	70,085	3,235	-	4	1	6,128	3,254	155,242
NY-AB (West)	4,474	14,878	1,606	2,834	-	-	-	1,072	827	25,691
NY-CDE (Cent North)	20,399	9,481	8,140	401	-	-	-	5,001	825	44,246
NY-F (Capital)	-	2,492	12,126	-	-	-	-	55	153	14,827
NY-GHI (Southeast)	14,799	318	12,715	-	-	-	-	-	532	28,365
NY-J (NY City)	-	5,694	24,860	-	-	-	-	-	166	30,720
NY-K (Long Island)	-	-	10,637	-	-	4	1	-	751	11,393
2020 Total All Zones	38,523	32,885	73,529	2,223	-	3	1	6,458	3,254	156,876
NY-AB (West)	4,126	14,882	1,589	1,866	-	-	-	1,077	821	24,361
NY-CDE (Cent North)	19,586	9,481	8,012	357	-	-	-	5,326	826	43,588
NY-F (Capital)	-	2,509	12,721	-	-	-	-	55	153	15,439
NY-GHI (Southeast)	14,810	318	15,443	-	-	-	-	-	533	31,105
NY-J (NY City)	-	5,694	25,237	-	-	-	-	-	165	31,096
NY-K (Long Island)	-	-	10,527	-	-	3	1	-	754	11,286
2021 Total All Zones	39,351	32,856	77,588	2,100	9	2	1	7,145	3,301	162,353
NY-AB (West)	4,151	14,875	1,574	1,755	-	-	-	1,315	822	24,492
NY-CDE (Cent North)	20,405	9,481	7,859	345	9	-	-	5,775	855	44,729
NY-F (Capital)	-	2,488	11,223	-	-	-	-	55	165	13,931
NY-GHI (Southeast)	14,795	318	18,271	-	-	-	-	-	532	33,917
NY-J (NY City)	-	5,694	26,230	-	-	-	-	-	170	32,094
NY-K (Long Island)	-	-	12,430	-	-	2	1	-	756	13,189
2022 Total All Zones	38,767	32,860	78,631	1,684	-	2	1	7,675	3,302	162,922
NY-AB (West)	4,475	14,877	1,517	1,350	-	-	-	1,539	818	24,576
NY-CDE (Cent North)	19,535	9,481	7,708	333	-	-	-	6,081	863	44,000
NY-F (Capital)	-	2,490	11,066	-	-	-	-	55	165	13,777
NY-GHI (Southeast)	14,757	318	18,095	-	-	-	-	-	532	33,702
NY-J (NY City)	-	5,694	27,908	-	-	-	-	-	168	33,771
NY-K (Long Island)	-	-	12,338	-	-	2	1	-	755	13,096
2023 Total All Zones	39,299	32,914	78,619	1,802	-	3	1	8,193	3,375	164,207
NY-AB (West)	4,114	14,884	1,507	1,464	-	-	-	1,536	819	24,325
NY-CDE (Cent North)	20,396	9,481	7,623	338	-	-	-	6,602	934	45,374
NY-F (Capital)	-	2,536	11,073	-	-	-	-	55	165	13,830
NY-GHI (Southeast)	14,789	318	18,124	-	-	-	-	-	532	33,764
NY-J (NY City)	-	5,694	27,949	-	-	-	-	-	166	33,809
NY-K (Long Island)	-	-	12,342	-	-	3	1	-	759	13,105
2024 Total All Zones	38,556	32,972	79,025	1,986	-	1	0	9,123	3,389	165,050
NY-AB (West)	4,162	14,887	1,508	1,639	-	-	-	1,544	819	24,559
NY-CDE (Cent North)	19,590	9,481	7,608	347	-	-	-	6,915	947	44,888
NY-F (Capital)	-	2,592	10,889	-	-	-	-	55	165	13,302
NY-GHI (Southeast)	14,803	318	17,609	-	-	-	-	-	533	33,264
NY-J (NY City)	-	5,694	27,439	-	-	-	-	-	165	33,299
NY-K (Long Island)	-	-	14,371	-	-	1	0	609	759	15,739
2025 Total All Zones	39,618	32,984	88,930	1,824	-	0	-	9,158	3,524	168,038
NY-AB (West)	4,473	14,896	1,495	1,485	-	-	-	1,539	810	24,698
NY-CDE (Cent North)	20,397	9,481	7,442	340	-	-	-	6,900	1,085	45,644
NY-F (Capital)	-	2,595	9,497	-	-	-	-	55	165	12,313
NY-GHI (Southeast)	14,747	318	16,679	-	-	-	-	-	532	32,277
NY-J (NY City)	-	5,694	29,247	-	-	-	-	55	165	35,161
NY-K (Long Island)	-	-	16,570	-	-	0	-	608	767	17,945

Scenario 32 - IPEC 2 Seq. Years HI Wind	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	39,975	27,273	67,425	5,376	-	6	1	5,865	3,146	149,066
NY-AB (West)	4,151	14,891	1,928	4,924	-	-	-	1,072	828	27,793
NY-CDE (Cent North)	20,408	9,481	9,427	452	-	-	-	4,737	818	45,322
NY-F (Capital)	-	2,583	17,839	-	-	-	-	55	153	20,630
NY-GHI (Southeast)	15,417	318	746	-	-	-	-	-	535	17,016
NY-J (NY City)	-	-	25,909	-	-	-	-	-	54	25,964
NY-K (Long Island)	-	-	11,576	-	-	6	1	-	758	12,342
2016 Total All Zones	37,299	27,303	72,705	5,019	6	25	4	5,884	3,317	151,562
NY-AB (West)	4,487	14,897	1,916	4,578	-	-	-	1,077	832	27,787
NY-CDE (Cent North)	19,587	9,481	9,344	442	6	-	-	4,752	823	44,434
NY-F (Capital)	-	2,608	17,842	-	-	-	-	55	153	20,659
NY-GHI (Southeast)	13,224	318	4,652	-	-	0	-	-	545	18,740
NY-J (NY City)	-	-	27,293	-	-	2	-	-	198	27,493
NY-K (Long Island)	-	-	11,658	-	-	23	4	-	765	12,450
2017 Total All Zones	31,062	27,352	76,578	4,912	24	16	2	6,121	3,298	149,364
NY-AB (West)	4,113	14,894	1,958	4,468	-	-	-	1,071	833	27,337
NY-CDE (Cent North)	20,407	9,481	9,446	444	24	-	-	4,994	823	45,618
NY-F (Capital)	-	2,659	18,165	-	-	-	-	55	153	21,032
NY-GHI (Southeast)	6,543	318	6,603	-	-	0	-	-	541	14,006
NY-J (NY City)	-	-	28,913	-	-	1	-	-	188	29,102
NY-K (Long Island)	-	-	11,493	-	-	15	2	-	759	12,270
2018 Total All Zones	31,110	32,847	74,940	9,698	-	3	1	7,265	3,251	153,115
NY-AB (West)	4,149	14,872	1,659	3,289	-	-	-	1,459	821	26,251
NY-CDE (Cent North)	19,531	9,481	8,384	409	-	-	-	5,731	821	44,357
NY-F (Capital)	-	2,482	14,154	-	-	-	-	75	153	16,864
NY-GHI (Southeast)	7,429	318	13,727	-	-	-	-	-	534	22,008
NY-J (NY City)	-	5,694	26,350	-	-	-	-	-	169	32,213
NY-K (Long Island)	-	-	10,666	-	-	3	1	-	753	11,424
2019 Total All Zones	39,672	32,869	68,495	8,140	-	4	1	8,419	3,248	155,847
NY-AB (West)	4,474	14,877	1,577	2,745	-	-	-	1,850	823	26,346
NY-CDE (Cent North)	20,399	9,481	8,029	395	-	-	-	6,475	823	45,601
NY-F (Capital)	-	2,498	11,521	-	-	-	-	95	153	14,267
NY-GHI (Southeast)	14,799	318	12,297	-	-	-	-	-	532	27,946
NY-J (NY City)	-	5,694	24,489	-	-	-	-	-	166	30,349
NY-K (Long Island)	-	-	10,583	-	-	4	1	-	751	11,338
2020 Total All Zones	38,523	32,896	71,288	1,956	-	3	1	9,907	3,249	157,823
NY-AB (West)	4,126	14,885	1,551	1,609	-	-	-	2,248	818	25,237
NY-CDE (Cent North)	19,586	9,481	7,863	347	-	-	-	7,544	825	45,646
NY-F (Capital)	-	2,519	11,762	-	-	-	-	115	153	14,549
NY-GHI (Southeast)	14,810	318	14,885	-	-	-	-	-	533	30,546
NY-J (NY City)	-	5,694	24,754	-	-	-	-	-	165	30,614
NY-K (Long Island)	-	-	10,473	-	-	3	1	-	754	11,232
2021 Total All Zones	39,351	32,878	74,602	1,847	5	2	1	11,740	3,290	163,716
NY-AB (West)	4,151	14,878	1,533	1,511	-	-	-	2,875	816	25,763
NY-CDE (Cent North)	20,405	9,481	7,661	336	5	-	-	8,730	851	47,469
NY-F (Capital)	-	2,507	10,219	-	-	-	-	195	169	13,026
NY-GHI (Southeast)	14,795	318	17,346	-	-	-	-	-	532	32,992
NY-J (NY City)	-	5,694	25,520	-	-	-	-	-	170	31,384
NY-K (Long Island)	-	-	12,323	-	-	2	1	-	756	13,082
2022 Total All Zones	38,767	32,899	74,631	1,472	-	3	1	13,416	3,289	164,479
NY-AB (West)	4,475	14,887	1,480	1,147	-	-	-	3,488	811	26,289
NY-CDE (Cent North)	19,535	9,481	7,452	325	-	-	-	9,773	858	47,428
NY-F (Capital)	-	2,520	9,660	-	-	-	-	155	165	12,500
NY-GHI (Southeast)	14,757	318	16,901	-	-	-	-	-	532	32,509
NY-J (NY City)	-	5,694	26,888	-	-	-	-	-	168	32,750
NY-K (Long Island)	-	-	12,249	-	-	3	1	-	755	13,008
2023 Total All Zones	39,799	32,944	74,116	1,521	-	3	1	15,052	3,356	166,293
NY-AB (West)	4,114	14,888	1,471	1,198	-	-	-	3,865	808	26,344
NY-CDE (Cent North)	20,396	9,481	7,380	323	-	-	-	11,013	927	49,520
NY-F (Capital)	-	2,563	9,513	-	-	-	-	174	165	12,415
NY-GHI (Southeast)	14,789	318	16,917	-	-	-	-	-	531	32,556
NY-J (NY City)	-	5,694	26,612	-	-	-	-	-	166	32,472
NY-K (Long Island)	-	-	12,223	-	-	3	1	-	759	12,987
2024 Total All Zones	38,556	33,008	73,978	1,548	-	1	0	17,167	3,361	167,618
NY-AB (West)	4,152	14,889	1,467	1,219	-	-	-	4,276	805	26,817
NY-CDE (Cent North)	19,590	9,481	7,307	329	-	-	-	12,088	934	49,728
NY-F (Capital)	-	2,625	9,166	-	-	-	-	195	165	12,152
NY-GHI (Southeast)	14,803	318	16,006	-	-	-	-	-	532	31,660
NY-J (NY City)	-	5,694	25,923	-	-	-	-	-	165	31,783
NY-K (Long Island)	-	-	14,110	-	-	1	0	609	759	15,479
2025 Total All Zones	39,618	33,039	74,956	1,594	-	-	-	18,346	3,485	171,038
NY-AB (West)	4,473	14,901	1,457	1,271	-	-	-	4,659	794	27,555
NY-CDE (Cent North)	20,397	9,481	7,186	323	-	-	-	12,808	1,062	51,257
NY-F (Capital)	-	2,645	8,188	-	-	-	-	215	165	11,214
NY-GHI (Southeast)	14,747	318	14,803	-	-	-	-	-	531	30,400
NY-J (NY City)	-	5,694	27,067	-	-	-	-	55	165	32,981
NY-K (Long Island)	-	-	16,254	-	-	-	-	608	767	17,630

Scenario 33 - IPEC 2 Seq. Years HI EE	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LauR)	Total
2015 Total All Zones	39,975	27,372	62,824	4,998	-	4	1	5,865	3,100	144,137
NY-AB (West)	4,151	14,904	1,804	4,569	-	-	-	1,072	812	27,312
NY-CDE (Cent North)	20,408	9,481	8,995	429	-	-	-	4,737	806	44,855
NY-F (Capital)	-	2,668	16,722	-	-	-	-	55	152	19,598
NY-GHI (Southeast)	15,417	318	471	-	-	-	-	-	533	16,739
NY-J (NY City)	-	-	23,949	-	-	-	-	-	44	23,993
NY-K (Long Island)	-	-	10,883	-	-	4	1	-	752	11,640
2016 Total All Zones	37,299	27,384	67,847	4,183	-	18	3	5,884	3,269	145,886
NY-AB (West)	4,487	14,904	1,804	3,761	-	-	-	1,077	819	26,852
NY-CDE (Cent North)	19,587	9,481	8,971	422	-	-	-	4,752	812	44,025
NY-F (Capital)	-	2,680	16,583	-	-	-	-	55	153	19,471
NY-GHI (Southeast)	13,224	318	4,210	-	-	0	-	-	541	18,294
NY-J (NY City)	-	-	25,344	-	-	1	-	-	183	25,528
NY-K (Long Island)	-	-	10,935	-	-	17	3	-	761	11,715
2017 Total All Zones	31,862	27,404	71,374	4,453	6	9	1	6,121	3,264	143,695
NY-AB (West)	4,113	14,899	1,819	4,029	-	-	-	1,071	822	26,752
NY-CDE (Cent North)	20,407	9,481	9,052	424	6	-	-	4,994	815	45,179
NY-F (Capital)	-	2,706	16,834	-	-	-	-	55	159	19,749
NY-GHI (Southeast)	6,543	318	6,042	-	-	0	-	-	536	13,439
NY-J (NY City)	-	-	26,835	-	-	0	-	-	181	27,017
NY-K (Long Island)	-	-	10,791	-	-	9	1	-	757	11,558
2018 Total All Zones	31,110	32,855	70,043	3,198	-	3	0	6,123	3,232	146,562
NY-AB (West)	4,149	14,874	1,600	2,803	-	-	-	1,071	814	25,311
NY-CDE (Cent North)	19,531	9,481	8,140	394	-	-	-	4,996	816	43,359
NY-F (Capital)	-	2,488	12,822	-	-	-	-	55	153	15,518
NY-GHI (Southeast)	7,429	318	13,123	-	-	-	-	-	533	21,402
NY-J (NY City)	-	5,694	24,287	-	-	-	-	-	165	30,147
NY-K (Long Island)	-	-	10,071	-	-	3	0	-	752	10,826
2019 Total All Zones	39,672	32,846	64,559	2,897	-	2	-	6,128	3,241	149,345
NY-AB (West)	4,474	14,874	1,550	2,510	-	-	-	1,072	820	25,300
NY-CDE (Cent North)	20,399	9,481	7,880	387	-	-	-	5,001	821	43,968
NY-F (Capital)	-	2,479	10,622	-	-	-	-	55	153	13,309
NY-GHI (Southeast)	14,799	318	11,725	-	-	-	-	-	532	27,374
NY-J (NY City)	-	5,694	22,779	-	-	-	-	-	165	28,638
NY-K (Long Island)	-	-	10,003	-	-	2	-	-	750	10,756
2020 Total All Zones	38,523	32,821	68,393	1,880	-	1	0	6,458	3,245	151,322
NY-AB (West)	4,126	14,876	1,531	1,533	-	-	-	1,077	817	23,960
NY-CDE (Cent North)	19,586	9,481	7,811	347	-	-	-	5,326	824	43,375
NY-F (Capital)	-	2,452	11,059	-	-	-	-	55	153	13,720
NY-GHI (Southeast)	14,810	318	14,562	-	-	-	-	-	533	30,223
NY-J (NY City)	-	5,694	23,466	-	-	-	-	-	165	29,326
NY-K (Long Island)	-	-	9,964	-	-	1	0	-	753	10,718
2021 Total All Zones	39,951	32,836	72,863	1,848	-	1	0	7,145	3,289	157,334
NY-AB (West)	4,151	14,878	1,526	1,509	-	-	-	1,315	818	24,196
NY-CDE (Cent North)	20,405	9,481	7,669	339	-	-	-	5,775	853	44,520
NY-F (Capital)	-	2,485	9,985	-	-	-	-	55	165	12,670
NY-GHI (Southeast)	14,795	318	17,196	-	-	-	-	-	532	32,841
NY-J (NY City)	-	5,694	24,587	-	-	-	-	-	166	30,447
NY-K (Long Island)	-	-	11,902	-	-	1	0	-	756	12,660
2022 Total All Zones	38,767	32,889	73,766	1,511	-	1	-	7,675	3,292	157,900
NY-AB (West)	4,475	14,886	1,483	1,183	-	-	-	1,539	815	24,380
NY-CDE (Cent North)	19,535	9,481	7,559	328	-	-	-	6,081	860	43,843
NY-F (Capital)	-	2,510	9,735	-	-	-	-	55	165	12,466
NY-GHI (Southeast)	14,757	318	17,004	-	-	-	-	-	532	32,611
NY-J (NY City)	-	5,694	26,144	-	-	-	-	-	165	32,004
NY-K (Long Island)	-	-	11,840	-	-	1	-	-	755	12,595
2023 Total All Zones	39,299	32,910	73,989	1,646	-	1	0	8,193	3,365	159,404
NY-AB (West)	4,114	14,887	1,479	1,316	-	-	-	1,536	815	24,147
NY-CDE (Cent North)	20,396	9,481	7,479	331	-	-	-	6,602	931	45,220
NY-F (Capital)	-	2,530	9,783	-	-	-	-	55	165	12,533
NY-GHI (Southeast)	14,789	318	17,190	-	-	-	-	-	531	32,829
NY-J (NY City)	-	5,694	26,218	-	-	-	-	-	165	32,077
NY-K (Long Island)	-	-	11,840	-	-	1	0	-	757	12,599
2024 Total All Zones	38,556	32,940	74,365	1,636	-	0	-	9,123	3,380	159,999
NY-AB (West)	4,162	14,885	1,479	1,296	-	-	-	1,544	815	24,182
NY-CDE (Cent North)	19,590	9,481	7,449	340	-	-	-	6,915	943	44,717
NY-F (Capital)	-	2,562	9,650	-	-	-	-	55	166	12,433
NY-GHI (Southeast)	14,803	318	16,560	-	-	-	-	-	533	32,215
NY-J (NY City)	-	5,694	25,452	-	-	-	-	-	165	31,311
NY-K (Long Island)	-	-	13,775	-	-	0	-	609	758	15,142
2025 Total All Zones	39,618	32,913	76,118	1,617	-	-	-	9,158	3,512	162,936
NY-AB (West)	4,473	14,888	1,475	1,284	-	-	-	1,539	806	24,465
NY-CDE (Cent North)	20,397	9,481	7,317	333	-	-	-	6,900	1,078	45,505
NY-F (Capital)	-	2,532	8,452	-	-	-	-	55	165	11,204
NY-GHI (Southeast)	14,747	318	15,545	-	-	-	-	-	531	31,142
NY-J (NY City)	-	5,694	27,364	-	-	-	-	55	165	33,278
NY-K (Long Island)	-	-	15,965	-	-	-	-	608	767	17,341

Scenario 34 - IPEC 2 Seq. Years HI EE, Wind, PV	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Blo; PV, DR/LaaR)	Total
2015 Total All Zones	39,975	27,317	62,171	4,913	-	4	0	5,865	4,035	144,281
NY-AB (West)	4,151	14,895	1,787	4,485	-	-	-	1,072	1,008	27,397
NY-CDE (Cent North)	20,408	9,481	8,924	428	-	-	-	4,737	1,001	44,978
NY-F (Capital)	-	2,624	16,488	-	-	-	-	55	348	19,515
NY-GHI (Southeast)	15,417	318	415	-	-	-	-	-	627	16,776
NY-J (NY City)	-	-	23,784	-	-	-	-	-	137	23,921
NY-K (Long Island)	-	-	10,774	-	-	4	0	-	914	11,693
2016 Total All Zones	37,299	27,298	69,163	472	-	18	3	5,884	4,687	144,825
NY-AB (West)	4,487	14,899	1,953	45	-	-	-	1,077	1,129	23,591
NY-CDE (Cent North)	19,587	9,481	9,228	427	-	-	-	4,752	1,121	44,596
NY-F (Capital)	-	2,600	16,947	-	-	-	-	55	460	20,062
NY-GHI (Southeast)	13,224	318	4,355	-	-	0	-	-	684	18,582
NY-J (NY City)	-	-	25,696	-	-	1	-	-	323	26,020
NY-K (Long Island)	-	-	10,984	-	-	17	3	-	970	11,974
2017 Total All Zones	31,062	27,307	72,465	472	3	8	1	6,121	5,158	142,594
NY-AB (West)	4,113	14,894	1,947	42	-	-	-	1,071	1,243	23,309
NY-CDE (Cent North)	20,407	9,481	9,260	430	3	-	-	4,994	1,234	45,809
NY-F (Capital)	-	2,615	17,091	-	-	-	-	55	569	20,270
NY-GHI (Southeast)	6,543	318	6,217	-	-	0	-	-	725	13,804
NY-J (NY City)	-	-	27,179	-	-	0	-	-	368	27,547
NY-K (Long Island)	-	-	10,831	-	-	8	1	-	1,015	11,854
2018 Total All Zones	31,110	32,775	69,285	415	-	3	0	7,269	5,572	146,425
NY-AB (West)	4,149	14,864	1,665	19	-	-	-	1,459	1,337	23,493
NY-CDE (Cent North)	19,531	9,481	8,156	396	-	-	-	5,731	1,336	44,631
NY-F (Capital)	-	2,418	12,442	-	-	-	-	75	678	15,613
NY-GHI (Southeast)	7,429	318	12,971	-	-	-	-	-	768	21,486
NY-J (NY City)	-	5,694	24,100	-	-	-	-	-	400	30,194
NY-K (Long Island)	-	-	9,951	-	-	3	0	-	1,054	11,008
2019 Total All Zones	39,672	32,760	62,610	398	-	1	-	8,419	6,043	149,903
NY-AB (West)	4,474	14,866	1,579	13	-	-	-	1,850	1,449	24,231
NY-CDE (Cent North)	20,399	9,481	7,790	385	-	-	-	6,475	1,451	45,980
NY-F (Capital)	-	2,401	10,035	-	-	-	-	95	786	13,316
NY-GHI (Southeast)	14,799	318	11,383	-	-	-	-	-	814	27,314
NY-J (NY City)	-	5,694	22,054	-	-	-	-	-	446	28,195
NY-K (Long Island)	-	-	9,769	-	-	1	-	-	1,097	10,867
2020 Total All Zones	38,523	32,726	64,504	384	-	1	-	9,907	6,519	152,514
NY-AB (West)	4,126	14,855	1,536	-	-	-	-	2,248	1,553	24,317
NY-CDE (Cent North)	19,586	9,481	7,602	334	-	-	-	7,544	1,564	46,112
NY-F (Capital)	-	2,378	9,711	-	-	-	-	115	898	13,102
NY-GHI (Southeast)	14,810	318	13,695	-	-	-	-	-	862	29,686
NY-J (NY City)	-	5,694	22,258	-	-	-	-	-	494	28,446
NY-K (Long Island)	-	-	9,703	-	-	1	-	-	1,148	10,851
2021 Total All Zones	39,351	32,739	67,952	327	-	1	0	11,740	7,033	159,134
NY-AB (West)	4,151	14,854	1,512	-	-	-	-	2,875	1,663	25,054
NY-CDE (Cent North)	20,405	9,481	7,440	327	-	-	-	8,730	1,702	48,084
NY-F (Capital)	-	2,383	8,812	-	-	-	-	135	1,021	12,351
NY-GHI (Southeast)	14,795	318	15,699	-	-	-	-	-	908	31,721
NY-J (NY City)	-	5,694	22,959	-	-	-	-	-	543	29,196
NY-K (Long Island)	-	-	11,530	-	-	1	0	-	1,196	12,728
2022 Total All Zones	38,770	32,749	67,471	307	-	1	-	13,415	7,500	160,214
NY-AB (West)	4,475	14,853	1,463	-	-	-	-	3,488	1,766	26,045
NY-CDE (Cent North)	19,537	9,481	7,232	307	-	-	-	9,773	1,817	48,147
NY-F (Capital)	-	2,402	8,087	-	-	-	-	155	1,131	11,775
NY-GHI (Southeast)	14,757	318	14,998	-	-	-	-	-	955	31,029
NY-J (NY City)	-	5,694	24,242	-	-	-	-	-	589	30,526
NY-K (Long Island)	-	-	11,449	-	-	1	-	-	1,241	12,691
2023 Total All Zones	39,299	32,785	66,745	311	-	1	0	15,050	8,029	162,221
NY-AB (West)	4,114	14,859	1,453	-	-	-	-	3,864	1,870	26,161
NY-CDE (Cent North)	20,396	9,481	7,128	311	-	-	-	11,012	1,994	50,321
NY-F (Capital)	-	2,432	7,781	-	-	-	-	174	1,240	11,627
NY-GHI (Southeast)	14,789	318	15,024	-	-	-	-	-	1,002	31,133
NY-J (NY City)	-	5,694	23,945	-	-	-	-	-	636	30,275
NY-K (Long Island)	-	-	11,414	-	-	1	0	-	1,288	12,703
2024 Total All Zones	38,556	32,810	66,519	317	-	-	-	17,165	8,014	163,381
NY-AB (West)	4,162	14,858	1,451	-	-	-	-	4,275	1,859	26,605
NY-CDE (Cent North)	19,590	9,481	7,085	317	-	-	-	12,086	1,996	50,515
NY-F (Capital)	-	2,459	7,774	-	-	-	-	195	1,237	11,665
NY-GHI (Southeast)	14,803	318	14,150	-	-	-	-	-	1,001	30,273
NY-J (NY City)	-	5,694	22,823	-	-	-	-	-	635	29,151
NY-K (Long Island)	-	-	13,275	-	-	-	-	609	1,287	15,171
2025 Total All Zones	39,617	32,804	67,658	307	-	-	-	18,939	8,124	166,850
NY-AB (West)	4,473	14,856	1,433	-	-	-	-	4,658	1,851	27,270
NY-CDE (Cent North)	20,397	9,481	6,959	307	-	-	-	12,803	2,116	52,063
NY-F (Capital)	-	2,455	6,913	-	-	-	-	215	1,237	10,821
NY-GHI (Southeast)	14,747	318	12,862	-	-	-	-	-	999	28,927
NY-J (NY City)	-	5,694	24,094	-	-	-	-	55	634	30,478
NY-K (Long Island)	-	-	15,396	-	-	-	-	608	1,285	17,290

Scenario 41 - IPEC In-serv. HI EE, Wind, PV + Offsh 8GW Tot Wind	Nuclear	Hydro&PS	NatGas	Coal	Oil 6	Oil 2	Ker	Wind	Other (Wood, Refuse, Bio, PV, DR/LaaR)	Total
2015 Total All Zones	39,975	27,317	62,171	4,919	-	4	0	5,865	4,035	144,281
NY-AB (West)	4,151	14,895	1,787	4,485	-	-	-	1,072	1,008	27,397
NY-CDE (Cent North)	20,408	9,481	8,924	428	-	-	-	4,737	1,001	44,978
NY-F (Capital)	-	2,624	16,488	-	-	-	-	55	348	19,515
NY-GHI (Southeast)	15,417	318	415	-	-	-	-	-	627	16,776
NY-J (NY City)	-	-	23,784	-	-	-	-	-	137	23,921
NY-K (Long Island)	-	-	10,774	-	-	4	0	-	914	11,693
2016 Total All Zones	39,502	27,298	67,660	456	-	12	2	5,884	4,671	145,485
NY-AB (West)	4,487	14,899	1,920	37	-	-	-	1,077	1,129	23,549
NY-CDE (Cent North)	19,587	9,481	9,092	419	-	-	-	4,752	1,171	44,452
NY-F (Capital)	-	2,600	16,659	-	-	-	-	55	460	19,775
NY-GHI (Southeast)	15,428	318	3,968	-	-	-	-	-	676	20,390
NY-J (NY City)	-	-	25,143	-	-	0	-	-	317	25,460
NY-K (Long Island)	-	-	10,877	-	-	12	2	-	969	11,860
2017 Total All Zones	39,941	27,307	66,695	446	-	5	1	6,121	5,130	145,645
NY-AB (West)	4,113	14,894	1,799	31	-	-	-	1,071	1,238	23,145
NY-CDE (Cent North)	20,407	9,481	8,715	415	-	-	-	4,994	1,230	45,242
NY-F (Capital)	-	2,615	15,091	-	-	-	-	55	569	18,329
NY-GHI (Southeast)	15,421	318	5,409	-	-	-	-	-	721	21,869
NY-J (NY City)	-	-	25,240	-	-	-	-	-	361	25,601
NY-K (Long Island)	-	-	10,440	-	-	5	1	-	1,012	11,458
2018 Total All Zones	39,069	32,776	63,045	389	-	2	0	7,877	5,558	148,716
NY-AB (West)	4,149	14,864	1,594	9	-	-	-	2,071	1,329	24,016
NY-CDE (Cent North)	19,531	9,481	7,800	380	-	-	-	5,731	1,332	44,254
NY-F (Capital)	-	2,419	10,299	-	-	-	-	75	677	13,470
NY-GHI (Southeast)	15,388	318	11,297	-	-	-	-	-	767	27,770
NY-J (NY City)	-	5,694	22,342	-	-	-	-	-	400	28,436
NY-K (Long Island)	-	-	9,714	-	-	2	0	-	1,054	10,771
2019 Total All Zones	40,298	32,762	61,421	393	-	1	-	9,645	6,033	150,555
NY-AB (West)	4,474	14,866	1,563	12	-	-	-	2,769	1,444	25,129
NY-CDE (Cent North)	20,399	9,481	7,739	381	-	-	-	6,781	1,447	46,227
NY-F (Capital)	-	2,403	9,684	-	-	-	-	95	785	12,968
NY-GHI (Southeast)	15,425	318	10,976	-	-	-	-	-	813	27,533
NY-J (NY City)	-	5,694	21,717	-	-	-	-	-	446	27,858
NY-K (Long Island)	-	-	9,741	-	-	1	-	-	1,097	10,840
2020 Total All Zones	39,149	32,726	60,757	325	-	1	-	14,519	6,505	153,982
NY-AB (West)	4,126	14,855	1,508	-	-	-	-	3,477	1,546	25,512
NY-CDE (Cent North)	19,586	9,481	7,503	325	-	-	-	8,159	1,559	46,613
NY-F (Capital)	-	2,378	8,972	-	-	-	-	115	897	12,363
NY-GHI (Southeast)	15,436	318	12,716	-	-	-	-	-	861	29,332
NY-J (NY City)	-	5,694	20,425	-	-	-	-	2,767	494	29,381
NY-K (Long Island)	-	-	9,639	-	-	1	-	-	1,148	10,782
2021 Total All Zones	39,977	32,734	64,189	320	-	1	0	16,337	7,018	160,576
NY-AB (West)	4,151	14,854	1,490	-	-	-	-	4,103	1,654	26,251
NY-CDE (Cent North)	20,405	9,481	7,310	320	-	-	-	9,345	1,697	48,557
NY-F (Capital)	-	2,387	8,262	-	-	-	-	135	1,020	11,805
NY-GHI (Southeast)	15,422	318	14,448	-	-	-	-	-	907	31,095
NY-J (NY City)	-	5,694	21,244	-	-	-	-	2,755	542	30,235
NY-K (Long Island)	-	-	11,436	-	-	1	0	-	1,196	12,633
2022 Total All Zones	39,992	32,761	62,032	302	-	1	-	20,762	7,482	162,732
NY-AB (West)	4,475	14,846	1,448	-	-	-	-	4,712	1,757	27,238
NY-CDE (Cent North)	19,537	9,481	7,129	302	-	-	-	10,386	1,810	48,645
NY-F (Capital)	-	2,422	7,448	-	-	-	-	155	1,131	11,156
NY-GHI (Southeast)	15,379	318	13,491	-	-	-	-	-	954	30,142
NY-J (NY City)	-	5,694	21,955	-	-	-	-	2,755	589	30,993
NY-K (Long Island)	-	-	10,561	-	-	1	-	2,755	1,241	14,558
2023 Total All Zones	39,926	32,797	61,442	305	-	0	-	22,385	8,007	164,862
NY-AB (West)	4,114	14,851	1,439	-	-	-	-	5,080	1,860	27,344
NY-CDE (Cent North)	20,396	9,481	7,040	305	-	-	-	11,622	1,984	50,827
NY-F (Capital)	-	2,453	7,269	-	-	-	-	174	1,240	11,136
NY-GHI (Southeast)	15,416	318	13,522	-	-	-	-	-	1,001	30,256
NY-J (NY City)	-	5,694	21,595	-	-	-	-	2,755	636	30,679
NY-K (Long Island)	-	-	10,578	-	-	0	-	2,755	1,287	14,619
2024 Total All Zones	39,182	32,807	61,260	308	-	-	-	24,590	7,986	166,133
NY-AB (West)	4,162	14,852	1,430	-	-	-	-	5,502	1,845	27,791
NY-CDE (Cent North)	19,590	9,481	6,948	308	-	-	-	12,699	1,984	51,010
NY-F (Capital)	-	2,462	7,102	-	-	-	-	195	1,236	10,995
NY-GHI (Southeast)	15,430	318	12,744	-	-	-	-	-	999	29,490
NY-J (NY City)	-	5,694	20,629	-	-	-	-	2,767	635	29,725
NY-K (Long Island)	-	-	12,407	-	-	-	-	3,428	1,287	17,122
2025 Total All Zones	40,287	32,802	62,293	299	-	-	-	25,683	8,095	169,459
NY-AB (West)	4,473	14,854	1,423	-	-	-	-	5,886	1,839	28,474
NY-CDE (Cent North)	20,397	9,481	6,881	299	-	-	-	13,414	2,103	52,575
NY-F (Capital)	-	2,455	6,563	-	-	-	-	215	1,237	10,469
NY-GHI (Southeast)	15,417	318	11,383	-	-	-	-	-	997	28,115
NY-J (NY City)	-	5,694	21,612	-	-	-	-	2,755	634	30,695
NY-K (Long Island)	-	-	14,433	-	-	-	-	3,413	1,285	19,131

Gold Book 2013 Loads and Peaks

Annual Energy (GWh)

	A	B	C	D	E	F	G	H	I	J	K
2012	15901	10031	16145	6561	7796	11456	10106	2917	6074	53662	23004
2013	15788	10071	16152	6701	8036	11712	10054	2922	6086	53762	22572
2014	15835	10073	16196	6789	8048	11716	10106	2938	6114	54016	22821
2015	15922	10076	16269	6835	8122	11803	10152	2951	6148	54310	22983
2016	15997	10083	16337	6850	8182	11872	10201	2976	6195	54732	23379
2017	16010	10080	16383	6866	8188	11926	10238	2976	6199	54762	23426
2018	16012	10080	16426	6874	8184	11978	10263	2993	6229	55032	23632
2019	16019	10080	16475	6868	8188	12028	10306	3007	6261	55309	23931
2020	16033	10085	16525	6871	8192	12077	10333	3029	6308	55727	24319
2021	16033	10081	16576	6889	8199	12126	10351	3038	6325	55878	24581
2022	16038	10081	16626	6895	8203	12173	10370	3053	6358	56172	24946
2023	16040	10082	16674	6888	8204	12220	10385	3071	6392	56471	25339
2024	16044	10082	16714	6892	8207	12259	10401	3084	6419	56706	25630
2025	16048	10083	16754	6896	8210	12298	10417	3097	6445	56943	25925
2026	16053	10083	16795	6900	8214	12337	10433	3110	6472	57180	26223
2027	16057	10084	16835	6904	8217	12376	10449	3123	6499	57418	26525
2028	16061	10084	16875	6908	8220	12415	10465	3136	6526	57657	26830
2029	16065	10084	16916	6912	8223	12454	10481	3150	6553	57898	27138
2030	16069	10085	16957	6916	8226	12494	10497	3163	6580	58139	27450

RNA 15x15 Loads and Peaks

	A	B	C	D	E	F	G	H	I	J	K
2012	15901	10031	16145	6561	7796	11456	10106	2917	6074	53662	23004
2013	15316	9867	15797	6632	8068	11682	9695	2835	5908	52176	21319
2014	15239	9785	15687	6701	8005	11550	9706	2795	5814	51358	21433
2015	15238	9700	15612	6660	8062	11559	9657	2760	5745	50758	21255
2016	15368	9706	15660	6653	8157	11638	9688	2772	5769	50962	21808
2017	15404	9704	15706	6632	8153	11723	9748	2773	5773	50995	21819
2018	15445	9729	15783	6633	8150	11814	9790	2779	5781	51081	22064
2019	15501	9765	15863	6597	8188	11891	9862	2778	5780	51068	22500
2020	15585	9812	15952	6582	8231	11969	9908	2785	5792	51180	23008
2021	15643	9833	16040	6614	8279	12034	9929	2778	5781	51082	23373
2022	15663	9828	16082	6598	8291	12051	9919	2793	5815	51379	23756
2023	15655	9823	16111	6553	8290	12086	9905	2800	5818	51422	24277
2024	15657	9815	16126	6526	8297	12099	9894	2796	5811	51348	24600
2025	15657	9811	16143	6502	8302	12113	9884	2792	5801	51273	24929

Peak Load (MW)

	A	B	C	D	E	F	G	H	I	J	K
2012	2822	2090	2925	936	1445	2375	2287	687	1437	11500	5526
2013	2657	2084	2904	868	1466	2368	2277	688	1433	11485	5515
2014	2688	2116	2941	887	1481	2395	2316	699	1454	11658	5566
2015	2716	2139	2969	897	1501	2431	2348	704	1475	11832	5609
2016	2734	2158	2996	903	1515	2458	2376	715	1496	12006	5688
2017	2743	2172	3012	906	1519	2480	2398	721	1511	12137	5713
2018	2749	2187	3032	910	1523	2502	2418	729	1527	12266	5760
2019	2755	2199	3045	910	1527	2520	2439	737	1542	12419	5827
2020	2763	2213	3064	911	1531	2540	2456	744	1559	12572	5902
2021	2769	2224	3079	915	1537	2558	2471	751	1574	12725	5979
2022	2776	2236	3099	917	1542	2577	2488	759	1587	12833	6060
2023	2783	2249	3113	916	1548	2596	2504	762	1594	12920	6149
2024	2789	2259	3127	917	1552	2614	2517	767	1605	13023	6216
2025	2789	2259	3134	918	1553	2622	2521	770	1611	13077	6287
2026	2790	2259	3142	918	1553	2630	2525	774	1618	13131	6359
2027	2791	2259	3149	919	1554	2639	2529	777	1625	13186	6432
2028	2792	2259	3157	919	1555	2647	2533	780	1631	13241	6506
2029	2792	2260	3165	920	1555	2656	2537	783	1638	13296	6581
2030	2793	2260	3172	920	1556	2664	2540	787	1645	13352	6657

	A	B	C	D	E	F	G	H	I	J	K
2012	2822	2090	2925	936	1445	2375	2287	687	1437	11500	5526
2013	2582	2025	2822	844	1425	2302	2213	669	1393	11163	5360
2014	2580	2031	2823	851	1421	2299	2223	671	1395	11189	5342
2015	2575	2028	2814	850	1423	2304	2226	667	1398	11216	5317
2016	2592	2046	2840	856	1436	2330	2252	678	1418	11381	5392
2017	2600	2059	2855	859	1440	2351	2273	683	1432	11505	5415
2018	2606	2073	2874	863	1444	2372	2292	691	1447	11627	5460
2019	2611	2084	2886	863	1447	2389	2312	699	1462	11772	5523
2020	2619	2098	2904	864	1451	2408	2328	705	1478	11917	5594
2021	2625	2108	2919	867	1457	2425	2342	712	1492	12062	5668
2022	2631	2119	2938	869	1462	2443	2358	719	1504	12164	5744
2023	2638	2132	2951	868	1467	2463	2374	722	1511	12247	5829
2024	2643	2141	2964	869	1471	2478	2386	727	1521	12344	5892
2025	2644	2141	2971	870	1472	2486	2390	730	1527	12395	5959

APPENDIX B: DETAILED DESCRIPTION OF MARKET ANALYTICS / PROSYM

Market Analytics is a zonal locational marginal-price-forecasting model that simulates the operation of the energy and operating reserves markets. The simulation engine used is PROSYM. The modeling system and the default data is provided by the model vendor, Ventyx.

The model does not simulate the forward capacity market and, therefore, does not require assumptions regarding the capital costs of new generation capacity and the interconnection costs associated with such capacity. However, the model does require assumptions about the quantity and type of existing and new capacity over the study horizon, fuel prices, and other factors. Section 2 catalogues the input assumptions to the model.

Unit Parameterization

PROSYM uses highly detailed information on generating units. Data on specific units in the Market Analytics database are based on data drawn from various sources including the U.S. Energy Information Administration, U.S. Environmental Protection Agency, North American Electric Reliability Corporation, Federal Energy Regulatory Commission (FERC), and New York ISO databases, as well as various trade press announcements and Ventyx's own professional assessment. Characteristics specified at the generating unit level include heat rate values and curve, seasonal capacity ratings, variable operating and maintenance costs, forced and planned outage rates, minimum up and down times, startup costs, ramp rates, and emissions rates.

Unit Commitment and Dispatch

Based upon hourly loads, PROSYM determines generating unit commitment and operation by transmission zone based upon economic bid-based dispatch, subject to system operating procedures and constraints. PROSYM operates using hourly load data and simulates unit dispatch in chronological order. In other words, 8,760 distinct hourly load levels are used for each TA for each study year. The model begins on January 1st and dispatches generating units to meet hourly loads. Using this chronological approach, PROSYM takes into account time-sensitive dynamics such as transmission constraints and operating characteristics of specific generating units. For example, one power plant might not be available at a given time due to its minimum down time (i.e., the period it must remain off line once it is taken off). Another unit might not be available to a given TA because of transmission constraints created by current operating conditions. These are dynamics that system operators wrestle with daily, and they often cause generating units to be dispatched out of merit order. Few other electric system models simulate dispatch in this kind of detail.

PROSYM simulates the effects of forced (i.e., random) outages probabilistically, using one of several Monte Carlo simulation modes. These simulation modes initiate forced outage events (full or partial)

based on unit-specific outage probabilities and a Monte Carlo-type random number draw. Many other models simulate the effect of forced outages by "de-rating" the capacity of all generators within the system. That is, the capacities of all units are reduced at all times to simulate the outage of several units at any given time. While such de-rating usually results in a reasonable estimate of the amount of annual generation from baseload plants, the result for intermediate and peaking units can be inaccurate, especially over short periods.

PROSYM calculates emissions of NO_x, SO_2, and CO_2, and based on unit-specific emission rates and MWh output quantities.

The model's fundamental assumption of behavior in competitive energy markets is that generators will bid their marginal cost of producing electric energy into the energy market. The model calculates this marginal cost from the unit's opportunity cost of fuel or the spot price of gas at the location closest to the plant, variable operating and maintenance costs, and opportunity cost of tradable permits for air emissions.

Transmission

The smallest location in Market Analytics is a Location (typically representing a utility service territory) which for modeling purposes is mapped into a Transmission Area (TA). A TA may represent one or more Locations. Transmission areas represent sub regions of Control Areas such as PJM. Transmission areas are defined in practice by actual transmission constraints within a control area. That is, power flows from one area to another in a control area are governed by the operational characteristics of the actual transmission liens involved. PROSYM can also simulate operation in any number of control areas. Groups of contiguous control areas were modeled in order to capture all regional impacts of the dynamics under scrutiny. The interface limits used in the simulations reflect the existing system, ongoing transmission upgrades including those that comprise the planned TOTS projects as well as other expected additions detailed in section 2.2.

APPENDIX C: KEY DOCUMENTS/EXCERPTS

On the following pages, we have included key documents/excerpts from the following:

- NYPSC IPEC Contingency Plan Proceeding Case 12-E-0503 ConEd/NYPA Filings – February, May, June 2013
- NYPSC IPEC Contingency Plan Proceeding Order Case 12-E-0503 November 2013
- NYPSC AC Proceeding Filing NY Transco Intention to Build Case 12-T-0502 January 2013
- NYPSC AC Proceeding Orders Instituting Proceeding, and Rulings Case 12-T-0502 November 2012, April 2013, September 2013
- NYISO 2012 Reliability Needs Assessment – IPEC Outage Sensitivity - Excerpt
- NY ISO September 2013 Testimony NYS Senate Committee
- NYISO Growing Wind – Final Report of the NYISO 2010 Wind Generation Study – Excerpt

BEFORE THE STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission To Review Generation Retirement Contingency Plan	)))	**Case 12-E-0503**

COMPLIANCE FILING OF
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
AND NEW YORK POWER AUTHORITY
WITH RESPECT TO DEVELOPMENT OF INDIAN POINT CONTINGENCY PLAN

Pursuant to the November 30, 2012 *Order Instituting Proceeding And Soliciting Indian Point Contingency Plan* ("November 30th Order"),[1] of the New York State Public Service Commission ("Commission"), Consolidated Edison Company of New York, Inc. ("Con Edison") and the New York Power Authority ("NYPA") hereby submit their Indian Point Contingency Plan (the "Plan").

I. EXECUTIVE SUMMARY

In its November 30th Order the Commission directed Con Edison with the assistance of NYPA to "develop a contingency plan for the potential closure of Indian Point upon the expiration of its existing licenses by the end of 2015."[2] As shown herein, the Plan is responsive to the requirements set forth in the November 30th Order and should be approved. To begin with, the Plan analyzed the impact that the retirement of the Indian Point Energy Center ("IPEC")[3] would have on the Bulk Power System ("BPS") taking into account the effect of the retirement

[1] Case 12-E-0503, *Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans*.
[2] Order, p. 5.
[3] Con Edison and NYPA make no assumption or determination about the potential closure of IPEC. This Plan is intended to provide a reliability solution for New York State if IPEC closes.

of Dynegy Danskammer, L.L.C. Units 1 – 6 ("Danskammer") and the implementation of incremental energy efficiency ("EE") and demand response ("DR") programs. Accordingly, the Plan provides for a fast track approach to having EE and DR program resources and transmission and generation projects in service by June 2016 (the "In-Service Deadline") to meet the electricity needs that could arise from the closure of IPEC.[4]

Specifically, the Plan provides for a two pronged approach. The first prong has Con Edison and NYPA[5] moving forward this spring upon Commission approval to implement three Transmission Owner Transmission Solutions ("TOTS") so that they can be in place by the In-Service Deadline. The second prong has NYPA issuing a request for proposals ("RFP") in the spring to solicit new incremental generation and transmission proposals that could also be in place by In-Service Deadline. Department of Public Service ("DPS") staff will evaluate all of the proposed projects and will then recommend to the Commission which projects should move forward to completion. DPS staff may call upon the New York Independent System Operator ("NYISO"), Con Edison and NYPA for technical assistance in analyzing any data needed for DPS staff's evaluation. The recommended projects could include the TOTS and/or solutions resulting from the RFP. Upon Commission approval, the projects ultimately selected will move forward towards completion unless halted by a Commission order, subject to cost recovery and other criteria as described herein.

---

[4] As described further, infra, the Plan provides for maintaining reliability criteria should IPEC close, resulting in enough resources to satisfy applicable reliability requirements in the summer of 2016, as such, the Plan is not intended to address levels of capacity with or without the retirement of IPEC. The Commission has also instituted a separate proceeding to solicit alternating current transmission upgrades. *See*, Case 12-T-0502, *Proceeding on Motion to Examine Alternating Current Transmission Upgrades*, Order Instituting Proceeding (November 30, 2013).

[5] This prong would also include New York State Electric and Gas Company ("NYSEG"), which is a co-sponsor of the MSSC Project, as defined infra.

The Plan consists of several integrated components, all of which need to be timely approved so that they can move forward according to the schedule specified herein. To make this Plan work, however, there are actions that the Commission needs to take to ensure that solutions are in place by the In-Service Deadline. If the Commission does not issue an order in April 2013, as requested below, authorizing Con Edison and NYPA to move forward with the TOTS subject to cost recovery and the halting mechanism, the likelihood of having sufficient resources available by the In-Service Deadline is greatly diminished. Moreover, completing all of these steps in the order proposed is a fundamental requirement without which each of the subsequent steps would be in jeopardy of being unable to proceed as proposed. Specifically, the Plan calls for the Commission to:

1. Issue an order[6] in March 2013 ("Interim Order") that:
    a. Requests that NYPA issue an RFP for new generation and transmission solutions and identifies any changes the Commission desires to the general description of the RFP terms, conditions, process and timeline described in this Plan;
2. Issue an order in April 2013 ("April Order") that:
    a. Directs Con Edison to implement its Indian Point EE/DR program as set forth in the Plan with cost recovery and subject to halting;
    b. Directs Con Edison to begin the development of the Second Ramapo to Rock Tavern 345 kV Line ("RRT Line") and the Staten Island Un-bottling ("SIU") Project, both of which will ultimately be transferred to and owned by the New

[6] Throughout this filing, the terms "order" and "directs" in this context means an order or direction of the Commission with respect to Con Edison and any other investor owned utility ("IOU") and a request with respect to NYPA.

York Transmission Company ("NY Transco"),[7] subject to the halting mechanism and cost recovery proposal set forth in this Plan;

c. Requests that NYPA, and directs that New York State Electric and Gas Corporation ("NYSEG"), begin the development of the Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring ("MSSC") Project, which also will ultimately be transferred to and owned by the NY Transco,[8] subject to the halting mechanism and cost recovery proposal set forth in this Plan;

d. Approves this Plan, including full recovery of all prudently incurred costs using the cost recovery and cost allocation approach set forth in Section VI of the Plan and the halting mechanism proposal described more fully in the Plan; and

e. Finds, on a preliminary basis, that the RRT Line; the MSSC Project; and the SIU Project are public policy projects that meet the public policy requirements of New York State, as identified in the November 30th Order and the New York Energy Highway Blueprint ("Blueprint")[9];

---

[7] As discussed more fully later in this filing, Con Edison and NYPA are active participants in the process of creating the NY Transco, a state-wide transmission company which will seek to develop transmission in New York State, including the RRT Line, the MSSC Project and the SIU Project that are being submitted as solutions in this docket. Two of these projects, the RRT Line and the MSSC Project, along with three other transmission projects, were also submitted as NY Transco projects in Commission Case 12-T-0502. As explained herein, Con Edison and NYPA intend that after these projects are started, they will be transferred to and owned by the NY Transco.

[8] *See* footnote 6, supra.

[9] A copy of the Blueprint can be found at: http://www.nyenergyhighway.com/PDFs/Blueprint/EHBPPT/.

3. Establish a public comment period in this docket pursuant to the State Administrative Procedure Act ("SAPA") to solicit comments on the proposed public policy requirement of developing an Indian Point Contingency Plan;
4. Issue an order in September 2013 ("September Order") that:
    a. Selects a final set of transmission and/or generation projects to move forward subject to the halting, cost allocation, and cost recovery mechanisms set forth in this Plan;
    b. Finds, pursuant to the SAPA public comment process, that developing and implementing an Indian Point Contingency Plan is a state public policy requirement that drives the need for transmission;
    c. Finds, to the extent that any of the TOTS are selected as final projects, that the RRT Line, the MSSC Project, and the SIU Project are public policy projects that meet the specified public policy requirements of New York State, as identified in the November 30th Order and the Blueprint;
    d. If any of the TOTS are chosen by the Commission as a Selected Project, as defined, infra, (i) authorizes Con Edison and NYSEG to fully recover, and (ii) establishes a mechanism to enable NYPA to fully recover, all reasonable and prudent costs incurred in pursuing each TOTS, to the extent such costs cannot otherwise be recovered through the NYISO tariff pursuant to the cost allocation method described in this Plan;

e. Directs that each New York Transmission Owner ("NYTO")[10] impacted by the Plan modify its retail cost recovery mechanisms for transmission and transmission-related costs, to the extent necessary, to provide that all NYISO transmission charges allocated to that individual NYTO as a result of the September Order will be recovered from that NYTO's retail customers;

f. Authorizes the recovery by Con Edison of all costs incurred in developing and implementing this Plan; and

g. Establishes a mechanism to enable NYPA to recover all costs incurred in developing and implementing this Plan, as more fully explained in Section VI of the Plan.

Accordingly, for the reasons set forth in this compliance filing, Con Edison and NYPA respectfully request that the Commission approve the Plan and issue orders, as specified above, such that the Plan can be implemented.

II. BACKGROUND

IPEC, which is owned by Entergy and located in Buchanan New York, consists of two nuclear generating facilities (Units 2 and 3), each capable of producing approximately 1020 MW for a total output of 2040 MW. Each of Unit 2 and 3 operate under a license from the Nuclear Regulatory Commission ("NRC"). Unit 2's NRC license expires in September 2013 and Unit 3's NRC license expires in December 2015. Entergy has submitted a timely request to the NRC to extend its license, which is currently pending before the NRC.

[10] The NYTOs consist of Central Hudson Gas and Electric Corporation, Con Edison / Orange & Rockland Utilities, Inc., Niagara Mohawk Power Corporation / National Grid, and New York State Electric & Gas Corporation / Rochester Gas and Electric Corporation, NYPA and the Long Island Power Authority.

The November 30th Order noted that the loss of IPEC "could result in significantly reduced reliability at the time of retirement and for several years thereafter until replaced."[11] According to the Commission, the "value of a Reliability Contingency Plan to address reliability concerns associated with the closure of the nuclear power plants at the Indian Point Energy Center is increasingly apparent."[12]

The November 30th Order required that the Plan address reliability needs that could result for the summer of 2016 so that the state would be ready for the closure of such a large generation facility, whether or not the facility is actually closed at that time. In other words, the directive in the November 30th Order indicates that the Commission has deemed it necessary and appropriate to pursue a public policy contingency plan for the possible closure of IPEC. Moreover, the November 30th Order stated that the Plan should account for the status of existing or proposed transmission facilities, EE, DR and other energy resources and include a competitive process to procure new resources.[13] In addition, the November 30th Order required that the Plan include a halting mechanism to control ratepayer costs in the event that a project that is being developed to address the potential closure of IPEC needs to be stopped.[14] The halting mechanism recognizes that to meet the In-Service Deadline, some projects will need to start design and engineering in early 2013.

The Commission established February 1, 2013 as the due date for the Plan.

III. APPLICABLE CRITERIA AND ANALYSIS

The NYISO undertakes an assessment of the reliability needs of the state's BPS every two years. The latest approved NYISO comprehensive planning study that encompasses the year

[11] Order, p. 4.
[12] Order, pp. 1-2.
[13] Order, pp. 5-7.
[14] Order, p. 7.

2016 is the 2012 Reliability Needs Assessment ("RNA").[15] The model and the assumptions used to develop the 2012 RNA were the result of extensive stakeholder review and represent the NYISO's most recent evaluation of supply and demand resources over the next ten years. Con Edison used the 2012 RNA analysis as the starting point in its analysis, noting that the NYISO base case analysis keeps IPEC in service (based on the NYISO rules and process employed for assessment of generator retirements), although the 2012 RNA did include a sensitivity analysis that considered the potential retirement of IPEC. The New York State Reliability Council ("NYSRC") Reliability Rules[16] state the reliability criteria that must be followed in planning the statewide BPS as well as the New York City ("NYC") system. The applicable NYSRC rule for planning the system in New York is Rule B-R1 and it applies after any first contingency ("Statewide Analysis"). This rule requires that the BPS must have sufficient resources to:

1. Return all facilities back within normal ratings after any first contingency, and,
2. Ensure the system will not exceed Long Term Emergency ("LTE") ratings if any second contingency were to occur.

The NYISO further expands the coverage of the statewide applicability of B-R1 to non-BPS facilities it considers important for the reliability of the New York Control Area ("NYCA") system. The augmented list defines the Bulk Power Transmission Facilities ("BPTF") system, which are examined in step 2 for statewide analysis. Rule I-R1 further states that certain portions of the Con Edison system in New York City ("NYC") must be designed to a "second

[15] A copy of the 2012 RNA can be found at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2012_RNA_Final_Report_9-18-12_PDF.pdf.

[16] A copy of the NYSRC reliability rules can be found at: http://www.nysrc.org/pdf/Reliability%20Rules%20Manuals/RR%20Manual%20Version%2031%205-11-2012%20Final.pdf.

contingency" ("NYC Analysis"). The Con Edison Planning Criteria[17] comply with I-R1 by modifying item 2 as follows:

2. Return all facilities back to normal ratings after any second contingency in the Con Edison system.

These different NYC and statewide deficiency standards may yield different results. The larger of the two deficiencies, if any, becomes the stated deficiency, with the understanding that the solution set must address both deficiencies, because they may occur in different parts of the system and the entire state needs to meet the NYSRC rules. The interaction between the solutions and the studied contingencies are different in the Statewide Analysis than in the NYC Analysis, because the contingencies studied are different, as explained above. For example, in step 1, the most severe statewide contingency may not be the same as the most severe NYC contingency.

As mentioned above, the deficiency analysis started with the NYISO's 2012 RNA model and then updated it to reflect the rescission of the mothball notice for Astoria Generating Company, L.P.'s Gowanus barges 1 and 4 and the effect of the EE/DR projects that the Order required Con Edison and NYPA to consider. The model reflects 100 MW of incremental EE/DR, as further detailed below. Based on this updated analysis ("Updated 2012 RNA"), the retirement of IPEC would yield a deficiency of 950 MW.[18] This was determined from the NYC Analysis. The Statewide Analysis resulted in a lower deficiency level. It must be noted that solutions may have a different impact on the magnitude of the reduction in deficiency for the NYC Analysis than they do for the Statewide Analysis.

[17] Con Edison's planning criteria is posted on its website at: http://www.coned.com/documents/Transmission_Planning%20_Criteria.pdf.
[18] The 950 MW deficiency is net of Con Edison's 100 MW EE/DR program.

The retirement of Danskammer was announced in January 2013 when the analysis presented above was nearing completion. Preliminary calculations made close to the filing date show an impact in the order of 400-425 MW for both the NYC Analysis and the Statewide Analysis from the closure of Danskammer. Accordingly, the overall deficiency, would be approximately 1350 to 1375 MWs.[19]

IV. ENERGY EFFICIENCY AND DEMAND RESPONSE

The November 30th Order directed that energy efficiency ("EE"), demand response ("DR"), and combined heat and power ("CHP") be taken into consideration in developing the amount of the deficiency that could result from the retirement of IPEC. Achieving demand reduction through new incremental programs will help reduce the need for additional generating or transmission capacity, which ultimately creates a long term avoided cost benefit for customers. Con Edison proposes to achieve an additional peak demand reduction of 100 MW by the In-Service Deadline through incremental programs ("IPEC EE/DR Program"). As such, the calculated deficiency due to the potential retirement of IPEC reflects this incremental 100 MW reduction. The details of the IPEC EE/DR Program are specified in Exhibit A.

As more fully described in Exhibit A, this 100 MW of incremental peak demand reduction can be implemented prior to the In-Service Deadline provided that: (1) approval to proceed and begin the incremental EE/DR surcharge collections is granted in the April Order; and (2) Con Edison is granted more flexibility to implement incremental programs than what is currently offered through the existing Energy Efficiency Portfolio Standard ("EEPS") programs.

The IPEC EE/DR Program will be additional to the suite of existing EEPS programs, with a focus on creating a holistic portfolio of solutions for reducing and managing loads

[19] The 1,350 to 1,375 MW deficiency is also net of Con Edison's 100 MW IPEC EE/DR Program.

primarily in large buildings. The IPEC EE/DR Program portfolio will include EE measures such as: LED lighting, installed advanced high efficiency HVAC and energy storage systems, and an extension of the steam air conditioning ("AC") incentives to all existing steam AC customers in addition to the Con Edison targeted Steam AC program initiated in October 2012. The range of programs envisioned under this portfolio approach would require the Commission to authorize in its April Order funding of at least $300 million to facilitate IPEC EE/DR Program success.[20]

In the event that the Commission terminates this Program prior to its approved conclusion through a halting order, Con Edison would continue collection of funds necessary for fulfillment of all customer commitments in place at the time of program halting and terminate the program from that point forward. Con Edison does not believe that reinstating programs after termination would be a viable option because of the time needed to ramp programs up and the attendant uncertainty that termination and subsequent reinstatement introduces into the market. With respect to the IPEC EE/DR Program, the estimated costs of halting at the key points in time are shown in Table 4.1 below:

TABLE 4.1

IPEC EE/DR Program	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $300,000,000)	9/30/2013	$500,000
	3/31/2014	$13,000,000
	12/31/2014	$70,000,000
* The "Estimated Partial At Risk Cost" is an estimate of the funds necessary for fulfillment of customer commitments in place at the time based on an estimate of a 2016 in-service date.		

[20] There may be joint opportunities with NYSERDA to achieve these incremental energy efficiency increases that contribute to peak load reductions. The Commission may choose to evaluate NYSERDA funding levels in order to achieve the incremental goal.

Con Edison has also initiated discussions with its partners at NYPA and NYSERDA to identify incremental EE, DR, and CHP initiatives over and above what is already included in the 2012 RNA that can be achieved prior to the In-Service Deadline. There exists a combination of programs with funding that is not currently included in the Updated 2012 RNA which is still being reconciled[21]. The Plan will ultimately incorporate these during the evaluation process that determines the final set of transmission and generation solutions. See Exhibit G for additional details.

V. PROPOSED SOLUTION

A. Overview

As stated in the Order:

> The potential retirement of a significant electric generating facility, such as the Indian Point Energy Center, requires significant advanced planning. Specifically, the size, location, and uncertainties regarding the potential retirement of the Indian Point Energy Center warrant such planning activities at this time. [The Commission] agree[s] there is a need to develop a contingency plan now to ensure reliability in the event the Indian Point Energy Center is ultimately retired.[22] (footnote omitted).

To have transmission and/or generation solutions in place by the In-Service Deadline, it is essential that action be taken without delay so that projects can get underway quickly. To that end, the Plan contemplates pursuing a two-pronged approach in parallel. On the first prong of the solution, Con Edison and NYPA, working with and as part of the NY Transco,[23] would begin developing the three TOTS. On the second prong, NYPA would begin a competitive

[21] The impact could be as much as 88 MW once the programs in-progress are fully identified and accounted for. These programs are in addition to the 100 MW incremental demand reduction to be achieved through the IPEC EE/DR Program.
[22] Order, pp. 1-2.
[23] *See* footnote 6, supra.

procurement process by issuing an RFP to solicit third party generation and third party transmission solutions to the potential closure of IPEC.

The Plan provides that the Commission will issue the Interim Order in March 2013 that requests NYPA to move forward with the RFP and provides input on any changes to the RFP terms, conditions and procedures desired by the Commission. The Plan also provides that the Commission will issue an order in April 2013 approving the Plan and authorizing Con Edison and NYPA to move forward with the EE/DR plan and with preliminary implementation of the TOTS, all subject to cost recovery and the halting mechanism. If the Commission does not issue an order in April 2013 authorizing Con Edison and NYPA to move forward with the TOTS subject to cost recovery and the halting mechanism, the likelihood of having sufficient resources available by the In-Service Deadline to address the potential closure of IPEC is greatly diminished.

Promptly upon receipt of the Interim Order, NYPA will issue an RFP soliciting generation and transmission solutions from private developers. The timeline and procedures by which the RFP process will be conducted are described below. Due to the number of steps involved and the statutory and regulatory requirements that must be satisfied, it is likely that a final selection of solutions will not occur, and third party project implementation will not be able to commence, before September or October 2013.

The Plan contemplates that DPS staff will evaluate the projects that respond to the RFP and the TOTS on a comparable basis and that the Commission will issue an order in September 2013 indicating the projects that will ultimately move forward to meet this public policy objective of preparing the state for the closure of IPEC. DPS staff may call upon the NYISO,

Con Edison and NYPA for technical assistance in analyzing any data needed for DPS staff's evaluation.

Each of the TOTS will be subject to the halting mechanism described below that will enable the Commission to terminate or suspend development efforts. Once the TOTS begin, the projects will continue unless the Commission issues an order directing that a specific TOTS project be halted.

B. Transmission Owner Transmission Solutions (TOTS)

1. Description of the TOTS

To ensure that the TOTS are in place by the In-Service Deadline, the Plan calls for the Commission to issue an Order in April 2013 directing that the following three transmission projects[24] move forward, subject to the halting and cost recovery mechanisms discussed later in this filing:

- RRT Line;
- MSSC Project; and
- SIU Project.

For a detailed description of each of these projects, please see Exhibit B for the RRT Line, Exhibit C for the MSSC Project, and Exhibit D for the SIU Project. As indicated in these exhibits, the estimated cost at the time of completion for each of these projects is: $123.1 million for the RRT Line; $76 million for the MSSC Project; and $311.64 million for the SIU Project.

[24] The NY Transco's East Garden City to New Bridge Road Project is still being evaluated to determine if it is able to expedite its schedule to meet the In-Service Deadline. If it can, it could be considered an additional TOTS project in this process, and an update will be provided to the Commission.

As more fully described in these exhibits, each of these TOTS can be completed by the In Service Deadline, provided that they timely receive the various governmental and regulatory approvals set forth in Exhibits B, C, and D. Specifically, the RRT Line, which already has its Article VII Certificate, can be in service by the In-Service Deadline, provided that it receives approval of its amended Environmental Management and Construction Plan ("EM&CP") by the first quarter of 2014. The MSSC Project can be in service by the In-Service Deadline, provided that all major licensing and permitting is completed by the end of 2013. Finally, the SIU Project can be completed by the In-Service Deadline, provided work on the project commences during the spring of 2013. The chart below shows the licenses, regulatory and study approvals already received by the proposed projects.

Second Rock Tavern to Ramapo 345kV Line	• NYISO approved System Impact Study ("SIS") August 16, 2012, Queue position 368 • Article VII Certificate Received January 25, 1972, Case 25845, Con Edison and Case 25741, Con Edison and O&R • Article VII Certificate Received January 24, 2011, Case 10-T-0283, O&R, Inc. (Feeder 28)
Marcy Series Compensation and Fraser to Coopers Corners Reconductoring Project	• NYISO Interconnection Application filed May 12, 2012; Queue position 380
Staten Island Un-bottling	• NYISO granted Con Edison a waiver of its SIS and Queue requirements on January 18, 2013

2. Ownership of the TOTS

As indicated in the NYTOs' January 25, 2013 submission (the "January 25th Filing") in Case 12-T-0502, *Proceeding on Motion to Examine Alternating Current Transmission Upgrades*, Con Edison and NYPA are active participants in the process of creating the NY

Transco,[25] which will seek to develop transmission facilities in New York State including the RRT Line, the MSSC Project, and the SIU Project that are being submitted as solutions in this proceeding.[26] It is anticipated that the NY Transco will be formed in October 2013. Also as indicated in the January 25th Filing, the NYTOs are in the process of developing the regulatory filings necessary to establish a transmission rate schedule at the Federal Energy Regulatory Commission ("FERC") as well as to implement the cost allocation and cost recovery mechanisms through the NYISO's tariff as described herein. Final regulatory approvals from FERC are anticipated in April 2014. Once FERC approval is obtained, the NY Transco will lead the development of the TOTS. To that end, Con Edison and NYPA will begin the work on these TOTS until the NY Transco is operational.[27] At that time the TOTS will be transferred to and completed by the NY Transco.

Moreover, as further indicated in the January 25th Filing, the NY Transco Projects are being proposed to accomplish the goals and objectives of the Commission's November 30, 2013 order in Case 12-T-0502,[28] which are to increase transfer capability through the central east interface[29] and to "meet the objectives of the Energy Highway Blueprint."[30] As is the case with the full panoply of NY Transco projects, the RRT Line and MSSC Project will provide

---

[25] The NY Transco will be a New York limited liability company ("LLC") that will be owned by affiliates of the NYTOs.

[26] In total, the NYTOs on behalf of the NY Transco proposed five projects in Case 12-T-0502. These projects are: MSSC Project; RRT Line; UPNY/SENY Interface Upgrade; Second Oakdale to Fraser 345 kV Line; and Marcy to New Scotland 345 kV Line. Con Edison and NYPA respectfully request that the Commission approve the NYTOs' January 25th Filing.

[27] It should be noted that the MSSC Project is being co-developed with NYSEG until the NY Transco takes over the development of that project. It is anticipated that following the issuance of the April Order, NYSEG would participate in the development of the MSSC Project.

[28] Case 12-T-0502, *Proceeding on Motion to Examine Alternating Current Transmission Upgrades,* Order Instituting Proceeding (November 30, 2013), p. 2.

[29] Id.

[30] Id.

congestion reduction benefits across key transmission interfaces and provide the public policy benefits specified in the Blueprint. As set forth in the January 25th Filing, the RRT Line and the MSSC Project, together with the other NY Transco projects, will provide significant public policy benefits to New York State, including production cost savings, job growth, increased local tax revenues, and emissions reductions. Due to their nature and location, these two projects are also highly effective solutions to the deficiency that would result from the closure of IPEC, and they can meet the In-Service Deadline requirement.

The SIU Project is also a NY Transco project, although it was not submitted as part of the January 25th Filing, since it does not directly affect congestion over the Central East Interface. The Plan calls for Con Edison to begin the work on the SIU Project, because it helps to address the reliability need associated with closure of IPEC. When the NY Transco is operational, this project will also be transferred to and finished by the NY Transco. As is the case with RRT Line and MSSC Project, this project provides the public policy benefits specified in the Blueprint.

C. Details of the Competitive Solicitation Process

The second prong in the Plan is the competitive solicitation process. This section includes procedures that will be followed to solicit proposals for generation and transmission resources that can be put in place on or before the In-Service Deadline to address the reliability needs that will result if IPEC ceases operations at the termination of its NRC licenses. It also sets forth criteria that will be employed to evaluate on a comparable basis all of the available solutions to the reliability need.

1. Steps and Timeline

Following issuance of the Interim Order, NYPA will issue the generation and transmission RFP, which is expected to occur around mid-March, 2013. Proposals in response to

the RFP ("Proposals") will be due from respondents ("Respondents") approximately 45 to 60 days after its issuance (May or early June, 2013). Shortly after issuance of the RFP, NYPA will schedule a bidders' conference to address any questions Respondents may have so that they may be guided in the development of their Proposals. Upon receipt of the Proposals, DPS staff will evaluate and analyze the complete set of Proposals, together with the TOTS, to determine which group of solutions can be expected to best satisfy the reliability needs, consistent with the evaluation criteria described below. DPS staff may call upon NYISO, Con Edison and NYPA for technical assistance in analyzing any data needed for DPS staff's evaluation

Upon conclusion of the evaluation process, DPS staff will prepare a recommendation for Commission review and action in the September Order. The recommendation will state which solutions should be pursued and may include a combination of one or more Proposals and TOTS. It is expected that the DPS staff recommendation will be presented to the Commission for action as soon as August 2013. Thereafter, on or about September 14, 2013, the Commission is expected to issue its September Order to designate the combination of Proposals and/or TOTS that it authorizes to move forward ("Selected Projects").

If the Selected Projects include one or more generation projects (each a "Selected Generation Project"), NYPA and the developer of each Selected Generation Project will negotiate and enter into a power purchase agreement ("PPA") as expeditiously as possible to support development, construction and operation of such Selected Generation Project.[31] If the Selected Projects include a transmission resource (whether a TOTS or an alternative transmission facility, each a "Selected Transmission Project"), the developer of the Selected Transmission Project will seek approval to construct, operate and receive compensation for its Project pursuant

[31] Con Edison will not be a counter party to any generation contract.

to a NYISO and/or Commission tariff. It is anticipated that the September Order will authorize the creation of a Commission tariff for the recovery of Selected Project costs that will be available to the extent an appropriate NYISO tariff is not available at the time the September Order is issued. As is the case for TOTS, the other Selected Projects chosen as part of the competitive solicitation process may also be halted under certain conditions.

2. RFP Terms and Conditions

Respondents will be required to provide written submissions setting forth in as much detail as possible the information identified in the RFP. A sample of the type of information that will be solicited in the RFP is set forth on Exhibit E. This sample, representative information list is provided for indicative purposes, but the list of required information included in the RFP may differ. Likewise, Con Ed and NYPA will be required to provide, at the same time as the Respondents, the same information as is required of the Respondents, so that the TOTS and Proposals can be evaluated by DPS staff on a comparative basis.

The RFP will include a form of PPA for generators that will set forth in detail provisions related to, among other things, the posting by the project proponent of security deposits to secure completion of the work, completion of milestones, and the halting mechanism, consistent with the description below. Likewise, the RFP will set forth similar requirements for transmission Proposals.[32] Respondents must identify at the time of Proposal submission any requested changes or additions to the process, the project agreements and/or requirements. An indicative list of the type of contractual terms and conditions, including milestones, is included as Exhibit

[32] We note, as well, that as part of the NYISO interconnection process, the developer of a Proposed Transmission Project may be obligated to enter into the NYISO's FERC-approved pro forma Large Facility Interconnection Agreement pursuant to the Large Facility Interconnection Procedures set forth in Attachment X of the NYISO Services Tariff.

F. Respondents should also indicate whether any of the information contained in their response should be considered as confidential.

The RFP will also require Respondents proposing generation solutions to submit pricing in two forms. The first will be in the form of a contract for differences ("CFD") in which the total cost of the project is fixed, but the monthly payment due will be reduced by the amount of the market revenues available to the project for that month. The second required bid form will state the fixed amount that the project developer requires on a dollar per month basis for support in addition to the market revenues it expects to realize. This second bid form is similar to the approach employed in the Renewable Portfolio Standards venue. Although there are benefits to either structure, requiring the submittal of this information will allow the evaluation process to consider the relative benefits of a known fixed monthly payment stream versus the variable customer costs associated with the CFD.

3. Comparative Evaluation Process

Both the TOTS and Proposals will be evaluated on a number of levels throughout the evaluation process. Initially, the Proposals will be subject to threshold criteria before being considered in the evaluation of their ability to meet the need and other criteria. This screening will consider whether the Proposal meets the following threshold criteria:

- Proposal received on time and in the proper format;
- Proposal is able to meet the In-Service Deadline;
- Generation proposals must provide at least 75 MW (UCAP) of incremental capacity;
- Both generation and transmission proposals must be interconnected to NYISO Load Zones G-K; and,

- Proposal provides pricing that is firm through December 31, 2013.

Proposals that meet the threshold criteria will then be subject to the evaluation process. This evaluation process will first review the Proposals for completeness and adherence to the RFP information request.[33] A detailed review of both the TOTS and Proposals' development plans will then be undertaken. Proposed solutions that have a high likelihood of technical and financial feasibility, as well as the ability to meet the In-Service Deadline, will then be subject to the next stage of the evaluation process.

Given that a single project is unlikely to meet the entire deficiency need, proposed solutions may be grouped into portfolios of projects and evaluated based on the categories listed below:

- Ability to help ensure that the reliability of the electric system is maintained or enhanced in the event of IPEC's closure, considering individual and collective impacts on the portfolio of Proposals;
- Deliverability;
- Cost-effectiveness and long-term public policy benefits to the State; including metrics such as production cost analysis
- Environmental considerations including emissions impact and use of existing rights-of-way; and
- Ability to provide opportunities for economic development and job creation.

The portfolio of projects that offers the best overall value to New York ratepayers based on the comprehensive evaluation process will be recommended by DPS staff for implementation.

[33] DPS staff will have the right to: (1) reject a response if it not complete; (2) contact bidders to clarify incomplete and/or unclear information in proposals; and (3) interview each bidder to obtain information regarding its project.

To perform this evaluation, Respondents will be asked to provide all pertinent information, a sample of which is described in Exhibit E.

VI. COST RECOVERY AND COST ALLOCATION MECHANISM

A. NYPA Cost Allocation and Cost Recovery Mechanism

To the extent any costs related to developing and implementing this Plan[34] are to be allocated to NYPA on behalf of its customers, the Commission should recognize that NYPA can accept costs only to the extent that NYPA's contracts with its customers allow recovery of such costs. The recovery of any costs that NYPA is contractually unable to recover from its customers ("Shortfall Amount") should first be recovered from the same end users to the extent that those same customers receive delivery service from the other NYTOs, excluding NYPA. To the extent that a Shortfall Amount still exists, that Shortfall Amount would have to be reallocated to the other end-users, including from NYPA customers whose contracts allow it.

In addition to recovering the Shortfall Amount, the Commission should require that once Commission-jurisdictional utilities and load serving entities ("LSEs") recover costs related to the development and implementation of this Plan that are incurred by NYPA and that are not recoverable through the NYISO tariff, those LSEs and utilities must remit any such costs recovered from their retail rate customers to NYPA. The mechanism developed by the Commission to address the particular cost recovery issues that pertain to NYPA described above is hereinafter referred to as the NYPA Recovery Mechanism.

[34] These costs included, but are not limited to, those incurred in preparing this Plan, developing the form of RFP, issuing the RFP, assisting (if requested) DPS staff, pursuing the TOTS, and all costs incurred in connection with the Selected Projects.

B. Cost Recovery and Cost Allocation Associated With Plan and RFP Related Expenses Incurred Before the September Order

Following the issuance of the Order, Con Edison and NYPA have incurred, and will continue to incur, costs in preparing the Plan, developing the form of RFP and associated agreements, issuing the RFP, contracting for consultants and outside legal representation, and assisting in the technical evaluation of Proposals (if requested), among other costs ("Plan & RFP Costs"). The April Order must ensure that: (1) Con Edison is able to recover all of its Plan & RFP Costs; and (2) NYPA is able to recover all such Plan & RFP Costs consistent with the NYPA Recovery Mechanism discussed in point VI.A. The Commission will determine the cost allocation approach for the Plan & RFP Costs. It is expected that in the April Order the Commission will allocate such costs on an appropriate public policy basis.

C. Cost Recovery and Cost Allocation Associated With TOTS Prior to the September Order

Following issuance of the April Order, Con Ed, NYPA and NYSEG will incur significant expenses associated with pursuing each TOTS until such time as it either is halted by a Commission order or is chosen as a Selected Project ("TOTS Costs"). The April Order must ensure that Con Edison, NYPA and NYSEG are able to recover all such TOTS Costs.

As stated in their January 25th Filing, the NYTOs, on behalf of the NY Transco, will pursue the establishment of a wholesale transmission revenue requirement and FERC-approved rate for the NY Transco projects, including the three TOTS projects proposed herein, that would be stated in the NYISO's Open Access Transmission Tariff ("OATT").[35] Once approved by FERC, the NY Transco's revenue requirement will be recovered from *all* LSEs in the NYISO's control area as specified in the January 25th Filing. The NYISO will be responsible for billing

[35] See January 25th Filing, pp. 21-24.

and collecting from all LSEs based on their energy consumption and location. The NY Transco will receive payments from the NYISO after the NYISO receives payments from the LSEs. The NYTOs, in their role as an LSE, will pass the NY Transco charge onto their full service retail customers as a NYISO charge consistent with their PSC-approved retail tariffs or, where necessary, under newly approved PSC tariffs. Accordingly, Con Edison and NYPA propose that the cost allocation method proposed in the January 25th Filing in Commission Case 12-T-0502 also apply to the TOTS for the same reasons set forth in that filing.

Until the NY Transco is operational, Con Edison and NYPA need certainty of cost recovery to proceed with their TOTS. In addition, since NYSEG is one of the NYTO developers of the MSSC Project, NYSEG also needs certainty of cost recovery to proceed with its part of the TOTS. Accordingly, Con Edison and NYPA request that the April Order state that the Commission is authorizing the recovery through a Commission jurisdictional method by Con Edison and NYSEG of all reasonable and prudent costs incurred in pursuing each TOTS, to the extent such TOTS Costs are not otherwise recovered through the NYISO tariff. In the case of NYPA, to the extent that such costs are not recovered through the NYISO tariff, such costs will be recovered through the NYPA Recovery Mechanism.[36] Further, to effectuate the cost allocation and cost recovery of the TOTS, the Commission should order each NYTO impacted by one of these projects to modify its retail cost recovery mechanisms for transmission and transmission related costs, to the extent needed, to provide that all NYISO transmission charges allocated to an individual NYTO in response to this Order will be recovered from that NYTO's retail customers. Finally, to the extent that the TOTS Costs cannot be recovered through the

[36] To the extent that Con Edison or NYPA are able to recover the costs of the TOTS through a FERC-approved rate, Con Edison and NYPA will refund to customers any costs already collected through Commission approved rates.

NYISO tariff, the Commission should establish a mechanism to allocate such costs consistent with public policy objectives, to all appropriate entities, including non Commission-jurisdictional entities, such as LIPA.

D. Cost Recovery and Cost Allocation Associated With Selected Projects

The final group of Selected Projects chosen by the Commission in the September Order may include a mix of TOTS, Selected Transmission Projects and Selected Generation Projects. The recovery of TOTS was discussed above.

If the competitive solicitation process results in a Selected Generation Project, the developer will be paid by NYPA pursuant to its PPA. These costs cannot be recovered through the NYISO tariff. Thus, the Commission also must ensure that the NYPA Recovery Mechanism enables NYPA to recover all costs in connection each Selected Generation Project consistent with the discussion in point A, above. The Commission could accommodate this by requiring LSEs and utilities that are allocated costs pursuant to the implementation of this plan to modify their retail rate mechanisms, to the extent necessary, to recover such costs from their retail customers. In addition, the Commission should require that those LSEs and utilities to remit any such costs recovered from their retail rate customers to NYPA.

The Commission will determine the cost allocation approach for each Selected Generation Project, with consideration of the public policy value across the State, including Long Island.[37] It is expected that in the September Order the Commission will allocate such costs on an appropriate public policy basis. It is possible that different allocations will apply to different Selected Projects. To the extent that the competitive solicitation process results in a

[37] It is Con Edison's position that even though LIPA is not currently under PSC jurisdiction, Long Island customers should participate in the costs of the Plan to the extent that they also benefit from the implementation of the State's public policy determination.

third party transmission project being selected, the costs associated with each project will be recovered through a NYISO tariff schedule.

VII. HALTING MECHANISM

The November 30th Order requires that all Selected Projects move forward subject to a halting mechanism. The halting mechanism applies equally to the TOTS, the IPEC EE/DR Program, and to Selected Projects identified in the September Order. The halting mechanism included as part of the Plan enables the Commission to halt any TOTS and any Selected Project at any time up to and including December 31, 2014. It is Con Edison's and NYPA's view that to attract a satisfactory quantity of Proposals, it is necessary to impose a final date at which a project may be halted. Con Edison and NYPA believe project developers are unlikely to participate in this process if they face the risk that they may spend extraordinary time and resources to bring on-line quickly a large project only to be told that they are being halted at a very late stage of development and will receive only their out of pocket costs. Neither Con Edison nor NYPA can predict those market or other events that would cause the Commission to decide to halt a particular project.

Due to the unique nature of transmission projects, Con Edison and NYPA will need to purchase equipment that may not be usable for any other project. As such, the halting mechanisms reflect the fact that once equipment is ordered, Con Edison and NYPA must be able to recover 100% of the cost of such equipment, less any reductions available from cancellation provision in the procurement contract and realized salvage value. The halting mechanism also recognizes that in order to meet the In-Service Deadline, Con Edison and NYPA will need to start engineering the projects in April 2013 and start procurement activities as early as the fourth quarter of 2013. Thus, the halting mechanism must provide for the full recovery of costs

incurred, as well as any contractual cancellation costs associated with such activities. It should also be noted that equipment procurement, engineering, and some construction activities will start even though not all of the required regulatory permits (environmental or community) will have been obtained as of this point in the project development schedule.

Recognizing the potential cost impacts to customers for the TOTS, Con Edison and NYPA can state the estimated costs they will incur for the TOTS at particular key points in time. Importantly, these estimates are based on conceptual project scopes and represent an order of magnitude reference for future project costs. As preliminary engineering and project tasks proceed, additional detail and certainty will support updated cost estimates. With respect to the RRT Line, the estimated costs of halting the project at the key points in time are shown in Table 7.1 below:

TABLE 7.1

Ramapo – Rock Tavern Line	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $123,100,000)	9/30/2013	
	3/31/2014	
	12/31/2014	

* The "Estimated Partial At Risk Cost" includes only an estimate of the committed dollars and do NOT include any cancellation charges that would be imposed by the contractors and equipment suppliers. The "Estimated Partial At Risk Costs" will be adjusted at the time of halting to include these costs. These costs are based on a 2016 in-service date estimate.

With respect to the SIU Project, the estimated costs of halting the project at the key point in time are shown in Table 7.2 below:

TABLE 7.2

Staten Island Un-bottling Project*	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $311,640,000)	9/30/2013	
	3/31/2014	
	12/31/2014	

* The "Estimated Partial At Risk Cost" includes only an estimate of the committed dollars and do NOT include any cancellation charges that would be imposed by the contractors and equipment suppliers. The "Estimated Partial At Risk Costs" will be adjusted at the time of halting to include these costs. These costs are based on a 2016 in-service date estimate.

With respect to the MSSC Project, the estimated costs of halting the project at the key point in time are shown in Table 7.3 below:

TABLE 7.3

Marcy South Series Compensation – Fraser to Coopers Corners Reconductoring Project*	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $76,000,000)	9/30/2013	
	3/31/2014	
	12/31/2014	

* The "Estimated Partial At Risk Cost" includes only an estimate of the committed dollars and do NOT include any cancellation charges that would be imposed by the contractors and equipment suppliers. The "Estimated Partial At Risk Cost" will be adjusted at the time of halting to include these costs. These costs are based on a 2016 in-service date estimate.

NYPA will include a requirement in the RFP process that each Respondent provide the costs of halting its proposed project for the same dates shown above.

If the Commission halts a Selected Project, the project developer must mitigate its costs by prompt cancellation and liquidation of contracts, and by salvage sale of equipment already delivered or manufactured, and taking all other reasonable and necessary steps to mitigate net costs. The project developer will be compensated for its reasonable and prudent costs incurred in connection with the Selected Project but without any mark-up or premium.

VIII. THE COMMISSION SHOULD ESTABLISH A PUBLIC COMMENT PROCESS

The joint NYISO/NYTO Order 1000 compliance filing to implement the public policy requirements of Order 1000 defines a public policy requirement as:

> A federal or New York State statute or regulation, including a NYPSC order adopting a rule or regulation subject to and in accordance with the State Administrative Procedure Act, or any successor statute, that drives the need for expansion or upgrades to the New York State Bulk Power Transmission Facilities.[38]

By including the reference to the SAPA, the filing clearly intended that market participants and other stakeholders would have an opportunity to comment on the proposed public policy requirements and to participate in the debate with respect to projects that are submitted in response to the enunciated public policy. Unfortunately, the November 30th Order does not provide for an opportunity for market participants to comment on the specified public policy requirement of developing the Plan. Con Edison and NYPA agree that it is important for market participants to have the opportunity to weigh in on the important policy goals set forth in the November 30th Order, namely the need to develop and implement the Plan. Moreover, since the transmission projects put forth in this docket would be included in the NYISO's public policy

[38] October 11, 2012 joint NYISO/NYTO compliance filing.

planning process, orders issued by the Commission should facilitate that effort, including establishing a public comment period pursuant to SAPA. The need for this process was recognized by the Commission in its filing in FERC Docket ER13-102 (the FERC Order 1000 docket) when it stated that:

> The NYPSC is committed to working with the NYISO, NYTOs, and other interested stakeholders to develop a process that fits the [FERC's] Order 1000 framework and facilitates the appropriate implementation of State public policy goals.[39]

To enable the TOTS to move forward, the Commission must take certain steps, in addition to the issuance of its April Order, to establish that there is a public policy requirement that drives the need for upgrades to the New York State BPS. These steps include: (1) establishing a comment period in this docket consistent with the requirements of SAPA to review the public policy requirements associated with developing the Plan; (2) issuing a subsequent order establishing the public policy requirements that drive the need for transmission; and (3) determining that the TOTS and other Selected Projects meet the identified public policy requirements and should therefore proceed to request the necessary local, state, and federal authorization for construction and authorization of the Projects. This is the process that the Commission is required to undertake in order to satisfy its role in the NYISO's filed Order 1000 public policy planning process.

IX. STAKEHOLDER INPUT

During the course of developing this filing, Con Edison and NYPA held several meeting and conference calls with representatives of DPS staff and the NYISO in order to receive their

[39] December 11, 2012 *Answer of the New York State Public Service Commission* in response to protests of the joint NYISO/NYTO Order 1000 public policy planning process compliance filing, Docket ER13-102, p. 11. The joint NYISO/NYTO compliance filing is currently pending before FERC.

feedback on the calculations of the deficiency, reliability contribution of the TOTS and the overall Plan. On January 14, 2013, Con Edison and NYPA hosted an all parties meeting at Con Edison for the purpose of presenting the concepts and receiving stakeholder feedback with respect to the preliminary deficiency analysis and concepts to implement the requirements of the November 30th Order. At the January 14th meeting, several parties offered feedback on the proposed solutions, which Con Edison and NYPA took into consideration in the development of this compliance filing.

X. DESCRIPTION OF CON EDISON AND NYPA

Con Edison is a regulated public utility that is a subsidiary of Consolidated Edison, Inc., a holding company. In 2011, Consolidated Edison, Inc. had $39.2 billion in assets and $12.9 billion in revenues. Con Edison serves a 660 square mile area with a population of more than nine million people. In that area, Con Edison serves approximately 3.3 million electric customers, 1.1 million gas customers, and 1,700 steam customers. Con Edison provides electric service in New York City and most of Westchester County, gas service in parts of New York City and steam service within the borough of Manhattan. Con Edison has approximately 1,180 circuit miles of transmission, including 438 circuit miles of overhead and 742 circuit miles of underground transmission.

NYPA is a corporate municipal instrumentality and a political subdivision of the State of New York. NYPA owns and operates 16 generating facilities and about 1,400 circuit miles of high voltage transmission lines. The electricity it generates and purchases is sold to municipally owned utilities and electric cooperatives, as well as to a variety of business, industrial and public customers throughout the State. NYPA uses no tax money or state credit. It finances its

operations through the sale of bonds and revenues earned in large part through sales of electricity.

Con Edison and NYPA have a significant interest in this proceeding and therefore request party status in this proceeding.

XI. CONTACT INFORMATION

The following people should be added to the official service list in this proceeding:

For Consolidated Edison Company of New York, Inc.

Stuart Nachmias
Vice President, Energy Policy & Regulatory Affairs
4 Irving Place, 2315-S
New York, N.Y. 10003
(212) 460-2580
nachmiass@coned.com

Neil H. Butterklee
Consolidated Edison Company of New York, Inc.
Assistant General Counsel
4 Irving Place, 1875-S
New York, N.Y. 10003
(212) 460-1089
butterkleen@coned.com

For New York Power Authority

John J. Suloway
Vice President, Project Development, Licensing & Compliance
123 Main Street
White Plains, NY 10601
(914) 287-3971
john.suloway@nypa.gov

Gerard Vincitore
Director, Resource Planning and Project Analysis
New York Power Authority
123 Main Street
White Plains, NY 10601
(914) 390-8221
gerard.vincitore@nypa.gov

Glenn D. Haake
Principal Attorney
New York Power Authority
30 South Pearl Street – 10th Floor
Albany, New York 12207-3245
(518) 433-6720
glenn.haake@nypa.gov

XII. LIST OF EXHIBITS

This filing contains the following exhibits:

Exhibit A – Level of Energy Efficiency included in the model

Exhibit B – Detailed Description of the Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project

Exhibit C – Detailed Description of the Second Ramapo to Rock Tavern 345 kV line

Exhibit D – Detailed Description of the Staten Island Un-bottling project

Exhibit E – RFP Respondent Information

Exhibit F - RFP Contract Terms

Exhibit G – Ongoing Demand Reduction Initiatives

XIII. CONCLUSION

As shown herein, the Plan is responsive to the requirements set forth in the Order and should be approved. There are, however, actions that the Commission needs to take to ensure that solutions are in place by the In-Service Deadline to address the potential closure of IPEC. Accordingly, for the reasons set forth herein, Con Edison and NYPA respectfully request that the Commission:

1. Issue an order in March 2013 (*i.e.*, the Interim Order) that:

a. Requests that NYPA issue an RFP for new generation and transmission solutions and identifies any changes the Commission desires to the general description of the RFP terms, conditions, process and timeline described in this Plan;

2. Issue an order in April 2013 (*i.e.*, the April Order) that:

a. Directs Con Edison to begin the development of the RRT Line and the SIU Project, both of which will ultimately be transferred to and owned by the NY Transco, subject to the halting mechanism and cost recovery proposal set forth in the Plan;

b. Requests that NYPA and directs that NYSEG begin the development of the Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project, which will ultimately be transferred to and owned by the NY Transco, subject to the halting mechanism and cost recovery proposal set forth in the Plan;

c. Approves this Plan including the cost recovery, cost allocation and halting mechanism proposals of the Plan;

d. Directs Con Edison to implement its IPEC EE/DR program as set forth in the Plan with cost recovery and subject to halting; and

e. Finds, on a preliminary basis, that the RRT Line; the MSSC Project; and the SIU Project are public policy projects that meet the public policy requirements of New York State as identified in the Order and the Blueprint;

3. Establish a public comment period in this docket pursuant to the SAPA to solicit comments on the proposed public policy enunciated in the Order;

4. Issue an order in September 2013 (*i.e.*, the September Order) that:

a. Selects a final set of transmission and generation projects to move forward subject to the halting, cost allocation, and cost recovery mechanisms set forth in this Plan;

b. Finds that developing and implementing an Indian Point Contingency Plan is a state public policy that drives the need for transmission;

c. Finds, to the extent that any of the TOTS are selected as final projects, that the RRT Line; the MSSC Project; and the SIU Project are public policy projects that meet the specified public policy needs of New York State as identified in the November 30th Order establishing this proceeding and the September Order;

d. Directs, to the extent that any of the TOTS are selected by the Commission as a final project, that it authorizes the recovery by Con Edison, NYPA and NYSEG of all reasonable and prudent costs incurred in pursuing each TOTS that is not otherwise recovered through the NYISO tariff pursuant to the cost allocation method described in the Plan;

e. Directs that each NYTO impacted by the Plan modify its retail cost recovery mechanisms for transmission and transmission-related costs, to the extent necessary, to provide that all NYISO transmission charges allocated to that individual NYTO as a result of the September Order will be recovered from that NYTO's retail customers;

f. Authorizes the recovery by Con Edison of all costs incurred in developing and implementing this Plan; and

g. Establishes a mechanism to enable NYPA to recover all costs incurred in developing and implementing this Plan.

Dated: February 1, 2013

Respectfully submitted,

/s/ Neil H. Butterklee
Neil H. Butterklee
Consolidated Edison Company of New York, Inc.
Assistant General Counsel
4 Irving Place, 1875-S
New York, N.Y. 10003
(212) 460-1089
butterkleen@coned.com

/s/ Glenn D. Haake by NHB
Glenn D. Haake
Principal Attorney
New York Power Authority
30 South Pearl Street – 10th Floor
Albany, New York 12207-3245
(518) 433-6720
glenn.haake@nypa.gov

Exhibit A

IPEC EE/DR Program

To mitigate the need created with a retirement of the Indian Point Energy Center ("IPEC") by the In-Service Deadline, Con Edison has been collaborating with its partners at NYPA and NYSERDA, initiating preliminary discussions that have identified incremental energy efficiency, demand response, and combined heat and power ("CHP") initiatives that can be achieved prior to the In-Service Deadline ("IPEC EE/DR Program"). Achieving sufficient demand reduction through new incremental programs will help reduce the need for additional transmission and generating capacity which ultimately creates a long term avoided cost benefit for customers.

Con Edison proposes to achieve an additional peak demand reduction of 100 MW by the In-Service Deadline through new incremental EE and DR initiatives. The IPEC EE/DR Program will be additional to the suite of existing EEPS programs, with a focus on creating a holistic portfolio of solutions for reducing and managing loads primarily in large buildings. The IPEC EE/DR Program portfolio will include EE measures such as LED lighting, installed advanced control systems such as Building Management Systems ("BMS") and Energy Management Systems ("EMS"), and other controls that address roof-top, package terminal air conditioning ("PTAC"), room air conditioning (and similar non-central air conditioning units), installed advanced high efficiency HVAC and energy storage systems, and an extension of the steam air conditioning ("AC") incentives to all existing steam AC customers in addition to the Con Edison targeted Steam AC program initiated in Oct 2012. The advanced control systems (BMS, EMS) will allow for additional participation in Con Edison and NYISO demand response programs.

The range of programs envisioned under this portfolio approach would require the Commission to authorize in its April Order funding of at least $300 million to facilitate success.[1]

Building on existing expertise and infrastructure will be critical for expeditiously increasing market penetration. Con Edison anticipates that to achieve the stated amount of demand reduction in such a short period of time, projects will need to be incentivized at a level that rapidly encourages interest and participation by customers. It anticipates that all or most incentive levels in the IPEC EE/DR Program will need to be structured to ensure that payback periods are 12 months or less (*e.g.*, new equipment will save as much energy in one year as the customer paid for the equipment). The short payback period is necessary since the projected savings assume equipment replacement prior to its end of life; customers require higher incentives to replace existing equipment and move to the highest efficiency equivalency. In addition, short customer payback periods would help to ensure that equipment replaced at end of life would not be replaced quickly with standard (less efficient) equivalents, and encourage the highest efficiency replacement.

The need to keep pace with evolving markets and customer preferences necessitates a flexible portfolio design. Con Edison proposes to continually evolve programs, adjust incentives, and introduce new programs into the market to keep customers engaged. Con Edison anticipates that the proposed IPEC EE/DR Program opportunities would be offered to customers as peak demand reduction incentives to complement or enhance existing EEPS incentives. Thus, the incremental 100 MW of demand reduction that is coincident with the system peak must be viewed as a "net" goal, making the need for flexible innovative programs even more critical to

[1] There may be joint opportunities with NYSERDA to achieve these incremental energy efficiency increases that contribute to peak load reductions. The Commission may choose to evaluate NYSERDA funding levels in order to achieve the incremental goal.

minimize the impact on existing programs and keep pace with new and evolving demand reduction opportunities.

Con Edison envisions that 100 MW of permanent peak demand reduction would be achieved through a customer incentive program funded through a separate surcharge that would sunset at the end of a four-year period (including time for administrative and operations completion of the program). Con Edison would recover actual expenses from the IPEC EE/DR Program through an electric surcharge on customer electric bills in the calendar quarter immediately following the calendar quarter in which they were incurred. As shown in TABLE A.1 below, projected expenses are expected to begin in the 2nd quarter of 2013 for administrative and marketing functions and conclude in the 3rd quarter of 2016.

TABLE A.1

	2013			2014				2015				2016		
Forecast Quarter	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**	**Q4**	**Q1**	**Q2**	**Q3**
TOTAL GROSS Projected Peak MW Cumulative	0	0	0	2	11	25	34	43	58	77	100	100	100	100
TOTAL Projected Cumulative Expenditures ($ Million)	0.2	0.5	6	13	28	50	70	105	157	208	249	280	295	300
Projected Quarterly Expense ($ Million)	0.2	0.3	5.5	7	15	22	20	35	52	51	41	31	15	5

In the event that the Commission terminates this IPEC EE/DR Program prior to its approved conclusion through a halting order, Con Edison would continue collection of funds necessary for fulfillment of all customer commitments in place at the time of program halting and terminate the IPEC EE/DR Program from that point forward. Con Edison does not believe that reinstating programs after termination would be a viable option because of the time needed

to ramp programs up and the attendant uncertainty that termination and subsequent reinstatement introduces into the market.

Con Edison does not believe that the Total Resource Cost ("TRC") test currently employed by EEPS should be used in the IPEC EE/DR Program to evaluate the cost effectiveness of EE measures. The TRC test is based on a multitude of variables that do not fully capture the environmental and societal value from permanently reducing the need for fossil generation capacity. The test also requires extensive communication between parties, and must be constantly recalculated during all components of program design. Each of these would hamper the achievement of demand reductions from the programs by the In-Service Deadline.

Achieving the IPEC EE/DR Program goals will require a regulatory structure that facilitates flexibility in design and expedited implementation. As such, and as an alternative to the traditional TRC test that is employed in the current EEPS programs, Con Edison proposes a flexible portfolio design to allow Con Edison to evaluate programs and projects on a rolling basis. The analytical framework for evaluation would be based on an efficiency cost curve (*e.g.*, $/ KW-saved) that is less than or equal to the total cost of building and running new generation, transmission, and distribution assets. This framework will be similar to that used in the current targeted demand side management program, but will include consideration of long term avoided costs of transmission and generation. Con Edison proposes to create a portfolio report of the programs and projects accomplished, measures used, dollars expended, and dollars committed that will be delivered to Staff on a quarterly basis.[2]

Recognizing the need for rapid and innovative action by Con Edison, the Commission should authorize a shareholder incentive that is more effective than that provided for Energy

[2] In the first quarterly report, Con Edison will identify the methodology for calculating and tracking incremental demand reductions that result from the IPEC EE/DR Program.

Efficiency Portfolio Standard ("EEPS") programs and provides a financial incentive designed instead to provide long term benefits. Con Edison proposes that the Commission consider the implementing one of the following alternative incentive structures, or other similar approach, that would be unique to this portfolio:

1) Con Edison will be authorized a rate of return on the total investment in the IPEC EE/DR Program for which the cost of demand reduction is less than the cost of new generation ($/kW);
2) Con Edison's IPEC EE/DR Program expense is treated as if it were a capital expense, and granted a rate of return based on a percentage of the most recent completed rate case; and
3) A pre-determined incentive value is agreed upon prior to IPEC EE/DR Program implementation, and is based on preliminary cost estimates and the most recent rate of return on capital; and upon expiration of the IPEC EE/DR Program (either through time or set by budget), the utility is granted a commensurate percentage of incentive based on degree of success in achieving reductions (*e.g.*, achieving 80% of target yields 80% of incentive or some other such agreed upon scaling).

Con Edison expects that the portfolio of programs identified below will experience upfront administrative hurdles and market barriers that will need to be overcome. Adequate time must be given to launch, procure contracts, and begin implementation prior to the closure of IPEC. If the net 100 MW of demand reduction are to be relied upon prior to IPEC's closure, Con Edison will need to secure an approval to proceed with funding, program development, and implementation by April 2013.

The IPEC EE/DR Program will focus on measures that have the greatest opportunities for success in a short timeframe and will most readily complement the existing EEPS programs to

yield cost effective demand reductions. These opportunities are predominantly found in large building lighting systems, HVAC, and control systems.

The IPEC EE/DR Program also recognizes there exist opportunities to work with NYSERDA to incentivize retail sales of energy efficient customer-run appliances and equipment that are run during times that are coincident to the transmission peak (*i.e.*, window AC units).[3] To the extent that NYSERDA's efforts are applied toward infrastructure planning through the IPEC EE/ DR Program, NYSERDA would provide access to all project data such as the type, size and location of the measures and projects it undertakes in Con Edison territory.

The table below outlines the range of programs that could be implemented:

TABLE A.2

Sample Measure[4]	***Permanent EE/DR MW Savings***[5]	***Description***	***Obstacles to Implementation***
LED Lighting	40	• Replace T5, T8, T12 with LED • Replace interior and exterior • Replace CFL, Halogen with LED • Controls	• Availability of bulbs, availability of ballasts and fixtures • Time frame for next generation LED bulb • Quality of light • Potential cannibalization of current EEPS
BMS, EMS and other	12	• Install advanced control systems	• Life of current system not exceeded • Cost of advanced systems • System compatibility, equipment and cabling footprint • Potential cannibalization of current EEPS
HVAC	20	• Install advanced High efficiency systems	• Life of current system not exceeded • Cost of hi efficiency systems

[3] To achieve the IPEC EE/DR Program goals, NYSERDA incentives would have to be structured with a goal of achieving a net reduction in electricity demand.
[4] Sample Measures listed are not intended to be exclusive.
[5] Permanent EE/DR MW Savings should be treated as approximations based on market potential as of mid 2011; these numbers are subject to change as final program design, implementation, and market penetration progress.

		• Controls	• Equipment and ductwork footprint • Potential cannibalization of current EEPS
Steam AC	8	• Extend steam AC incentives to all existing steam AC customers	• Life of current system not exceeded • High cost of steam • Market availability of steam AC chillers
Other	20	• Other permanent Efficiency and Demand Response measures	

In addition to the examples and programs cited above, Con Edison believes that new and innovative program designs may create additional opportunities for demand reduction after the initial JPEC EE/DR Program portfolio has been crafted. Accordingly, Con Edison reiterates the need to maintain flexibility in implementing its portfolio, and the ability to quickly assess and pursue new program opportunities to achieve maximum demand reduction at a reasonable cost.

Exhibit B

Detailed Description of Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project

Detailed Description of Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project

I. Project Description:

The Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring ("MSSC") project will add switchable series compensation to increase power transfer by reducing series impedance over the existing 345kV Marcy South lines. Specifically, the project will add 40% compensation to the Marcy-Coopers Corners 345kV line and 25% compensation to the Edic-Fraser / Fraser-Coopers Corners 345kV line through the installation of capacitors. This project will reconductor approximately 21.8 miles of the NYSEG-owned Fraser-Coopers Corners 345kV line (FCC-33) with 2784 ACCC conductor using existing towers and will involve upgrades at the Marcy, Fraser, and Coopers Corners 345kV substations. The project will increase thermal transfer limits across the Total East interface and the UPNY/SENY interface and will also provide a partial solution for system reliability should IPEC retire.

II. Use of Existing Rights-of-Way:

Subject to confirmation of the on-going conceptual engineering studies, it is not anticipated that additional property will be required for the re-conductoring of the approximately 21.8 miles on the FCC-33 line or the installation of the capacitors in the substations

III. Preliminary Engineering Status:

Preliminary engineering is currently underway to:

- Provide a complete definition of system equipment;
- Develop a footprint and physical layout for the series compensation;
- Provide field walk downs, site surveys, and fully specify location options;

- Detail fully compliant options for protection and control of the series capacitors and the lines in the substation yards and control rooms;
- Confirm the adequacy of structures and costs to re-conductor approximately 21.8 miles of transmission line FCC-33;
- Provide cost estimates of detailed engineering, material testing, commissioning, and other modifications.

In the near future we expect to commence Transient Recovery Voltage Calculations, Electrostatic and Electromagnetic Calculations, and Sub-Synchronous Resonance Analysis.

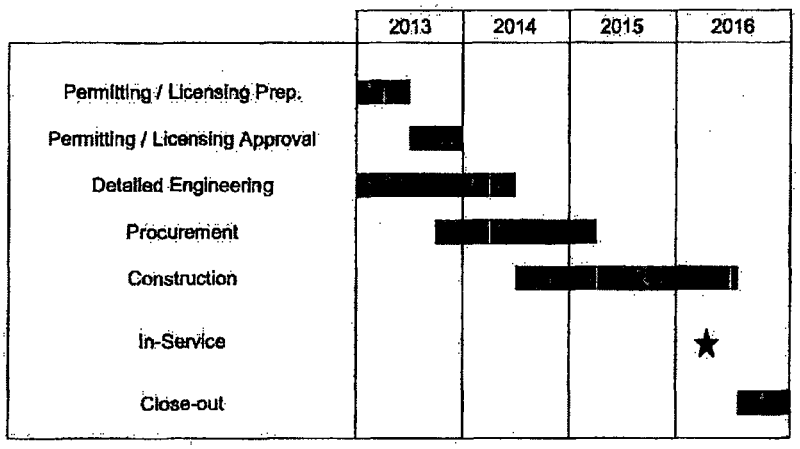
IV. Interconnection Status:

The MSSC project has NYISO queue position 380 and the development of the System Impact Study is currently underway.

V. Estimated In-Service Date:

Assuming that licensing and permitting are completed by the end of 2013 and provided that there are no delays or complications in procurement or construction, the MSSC project could be in service by June 2016. Conceptual/preliminary engineering has begun and, upon its completion, more detailed engineering and environmental studies necessary to support regulatory approval applications will be undertaken.

VI. Estimated Project Schedule:



VII. Preliminary Cost Estimate (2016 dollars): $76 million

Redacted

Exhibit C

Detailed Description of the

Second Ramapo Rock Tavern 345kV line

I. Project Description:

The project will establish a second 345kV line from the Ramapo 345kV substation to the Rock Tavern 345kV substation. The project will increase the import capability into Southeastern New York, including New York City, during normal and emergency conditions and will provide a partial solution for system reliability should Indian Point Energy Center retire. The project will be located in Orange and Rockland Counties in New York along the existing right-of-way of the existing Con Edison 345kV line 77 (Ramapo to Rock Tavern). The transmission line terminals are located in NYISO Zone G.

Central Hudson's Rock Tavern 345kV substation will be connected to Con Edison's Ramapo 345kV substation by performing three concurrent system upgrades. The first upgrade would convert O&R's Feeder 28 (Ramapo 138kV substation to Sugarloaf 138kV substation) from its current operating voltage of 138kV to 345kV by reconnecting Feeder 28 at the Ramapo 345kV substation. The second upgrade would be to create a Sugarloaf 345kV substation and add a 345 / 138kV step-down transformer between the Sugarloaf 345kV and 138kV substations. The third upgrade would be to install a 345kV line between Rock Tavern and the Sugarloaf 345kV substation utilizing bundled 1590 ACSR (2 x 1590 ACSR) conductor.

II. Use of Existing Rights-of-Way:

The project will utilize the existing right-of-way along the existing transmission route from Ramapo to Rock Tavern 345kV substations. No additional land rights are required to construct the substation upgrades at either the Ramapo substation or the Rock Tavern substation in order to connect the new 345kV line. Siting of the property for the Sugarloaf 345kV substation has not been completed, but it is anticipated this substation will utilize existing property owned by O&R in the vicinity.

III. Interconnection Status:

The second Ramapo to Rock Tavern 345kV line was submitted to the NYISO interconnection process and has queue position 368. A System Impact Study was completed and approved by the NYISO Operating Committee on August 16, 2012. No further action related to the NYISO interconnection process is required.

IV. Permitting Status:

Con Edison received an Article VII Certificate in 1972 which authorized the construction of the Ramapo to Rock Tavern transmission route with towers that could accommodate two 345kV circuits, although only one circuit was needed at that time. The Commission Order granting the Certificate allowed Con Edison to install the additional circuit with prior notice to the Commission. In 2010, Con Edison and O&R jointly petitioned the Commission to allow O&R to install proposed Feeder 28, a second circuit on the existing towers along the transmission route from Ramapo substation to Sugarloaf substation. The Commission allowed O&R to install proposed Feeder 28 under the original Article VII Certificate issued in 1972. Given the passage of time since the Certificate was granted, the Commission requested that O&R submit an updated Environmental Management and Construction Plan ("EM&CP") presenting an assessment of potential environmental impacts associated with the installation of the proposed additional circuit. A Commission Order transferring a portion of the Article VII Certificate to O&R for installation of Feeder 28 from Ramapo to Sugarloaf, and approving the updated EM&CP, was issued on January 24, 2011 (Case 10-T-0283).

Based on the experience with Feeder 28, the NYTOs expect that the only key permitting/approval requirement for the second Ramapo to Rock Tavern transmission line, also called Feeder 76, is Commission approval of updated EM&CP for the project. This EM&CP

would address the Sugarloaf substation to Rock Tavern substation section of the existing right-of-way, including any incremental physical reinforcements needed to bring the existing transmission towers to current standards. The EM&CP would also address the proposed Sugarloaf 345kV substation and the incremental additional equipment required at Ramapo and Rock Tavern substations, and would be equivalent in content and level of detail to the Feeder 28 EM&CP which was approved by the Commission in January 2011.

The Feeder 76 EM&CP would present an assessment of potential environmental impacts associated with the installation of the proposed additional circuit on the existing towers, and with the construction and operation of the proposed Sugarloaf 345kV substation and the incremental additional equipment at Ramapo and Rock Tavern substations. The EM&CP would identify the governing Federal/State/Local permitting/regulatory requirements, and then evaluate the Feeder 76 project components against the substance of those requirements. This effort would include evaluation of Feeder 76 predicted magnetic field levels against the Commission's interim 200 mG standard, and consultation with other State and Local agencies on matters within their jurisdiction, for example with NYSDEC regarding protection of State endangered/threatened species.

The following sets forth a preliminary list of major Federal, State and Local permits/approvals which are expected to be filed separately from the EM&CP:

1) Federal permits/approvals governing Feeder 76 project activities in any Federally-regulated wetlands and water bodies:

   The existence and extent of any Federally-regulated wetlands or water bodies would be identified during preparation of the Feeder 76 EM&CP. Feeder 76 installation activities affecting any Federally-regulated wetlands and water bodies would likely be

permitted under the Clean Water Act Section 404 Nationwide Permit No. 12 ("NWP 12"), which was developed to cover land clearing and similar activities associated with installation of utility line crossings of wetlands and water bodies. NWP 12 provides authorization for such activities provided the cleared area is kept to the minimum necessary and preconstruction contours are maintained. The eligibility of Feeder 76 installation activities for NWP 12 would be confirmed during preparation of the EM&CP, and the required Pre-Construction Notification ("PCN") prepared and filed with the U.S. Army Corps of Engineers.

2) Federal requirements governing endangered/threatened species and archeological/cultural resources, which may require that protective measures be employed during installation of Feeder 76:

   During preparation of the EM&CP, the potential for Feeder 76 installation activities to affect such resources would be identified, any necessary Federal agency consultation would be performed, and any necessary protective measures would be developed.

3) State permits/approvals governing Feeder 76 project activities in any State-regulated wetlands and water bodies:

   The existence and extent of any State-regulated wetlands (defined differently than Federally-regulated wetlands) and State-regulated water bodies would be identified during preparation of the Feeder 76 EM&CP. NY Transco would likely seek to follow the recent Con Edison / O&R Feeder 28 experience for installation activities affecting State-regulated wetlands and water bodies. Briefly stated, for Feeder 28 O&R was given authorization by NYSDEC to conduct feeder installation activities in

accordance with a NYSDEC General Permit issued to O&R under Environmental Conservation Law Article 15 – Protection of Waters and Article 24 – Freshwater Wetlands. The eligibility of Feeder 76 activities for coverage under Con Edison/ O&R's corresponding NYSDEC General Permit would be identified during preparation of the EM&CP, and the required notification package submitted to the NYSDEC.

4) Coverage under NYSDEC SPDES Construction Storm Water General Permit:

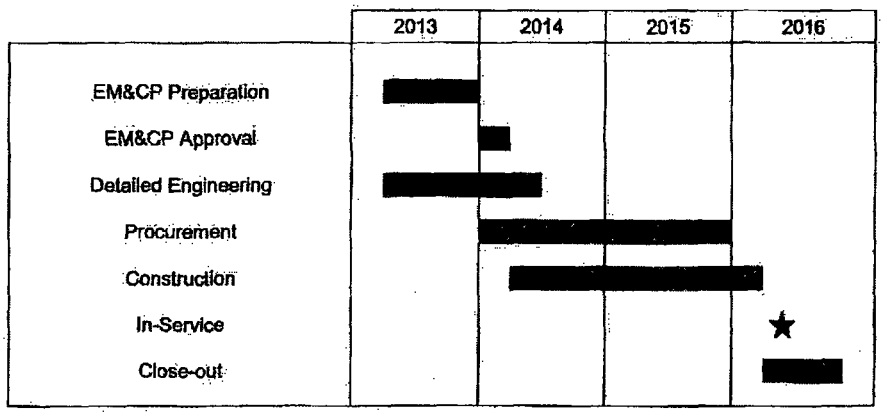
The Feeder 76 EM&CP preparation effort would include a State Pollutant Discharge Elimination System (SPDES) Construction Storm Water Pollution Prevention Plan (SWPPP) as a component of the EM&CP, and a Notice of Intent for filing by NY Transco with NYSDEC.

5) State and Local Transportation and Utility Crossing permits/approvals:

The Feeder 76 installation activities have the potential to impact roads, highways, railroads and other existing utilities. The EM&CP preparation process would identify each crossing affected and outline construction practices ensuring that vehicular, pedestrian or rail traffic is not adversely impacted. The appropriate state and local officials would be contacted and required permits for crossing and construction access would be obtained. For New York State highways this would require preparation and submission of NYSDOT Highway Work Permit applications, and Maintenance & Protection of Traffic Plans.

V. Estimated In-Service Date: June 2016

VI. Estimated Project Schedule[6]:



VII. Preliminary Cost Estimate (2016 dollars): $123 million

[6] The schedule reflects an accelerated EM&CP preparation and approval process to meet the target in-service date of June 2016, and is dependent on receiving an order from the Commission to proceed with the project in April 2013 in order to meet the estimated milestones.

Redacted

Exhibit D

Detailed Description of the Staten Island Un-Bottling Project

Detailed Description of the Staten Island Un-bottling Project

I. Project Description:

Un-bottling Staten Island generation and transmission resources will require the installation of a new 345kV feeder and the forced cooling of existing four 345 kV feeders. The new feeder would mitigate a contingency within New York City by installing a new double leg feeder into new positions at the Goethals and Linden substations. The forced cooling of the existing four 345 kV feeders will increase transmission capacity between Goethals, Gowanus, and Farragut substations. The Project would be located in Staten Island and Brooklyn, New York and Union County (Linden), New Jersey. This project is located in NYISO Zone J.

The new 345kV double circuit solid dielectric cable system interconnecting the Goethals substation to the Linden substation will be approximately 1.5 miles. The feeder will cross Arthur Kill River to get from Staten Island, NY to Linden, NJ. Both substations will need new 345kV breakers and bus modifications to establish new bus positions for the new feeder and to maintain feeder separation. Linden Substation is an SF6 (sulfur hexafluoride) station that requires SF6 equipment to expand the station. Although Goethals Substation is an open air substation, due to limited space, the new bus position needs to be established using SF6 equipment.

The project also includes the installation of ten (10) refrigeration plants to increase transmission capacity between Goethals, Gowanus, and Farragut substations on the four 345 kV feeders 25, 26, 41, and 42. Six of these plants will be installed in support of feeders 25 and 26; one each at Gowanus and Goethals Substations and four along the route of the feeders. The plants along the route need to be sited equidistant to each other and the interconnecting stations. One of these locations is the current Bay Street property, which will hold two cooling plants.

The other location will hold another two plants in support of feeders 25 and 26 will need to be acquired. The next four plants will be installed in support of feeders 41 and 42; two each at Gowanus and Farragut Substations.

II. Property Acquisition:

The first two of the six cooling plants will be located at the terminal stations of feeders 25 and 26. The next two of the six cooling plants required to cool feeders 25 and 26 will be installed at the Bay Street property. The last two cooling plants will require the acquisition of new property. This new property needs to be located as close as possible to the route of feeders 25 and 26, large enough to hold two refrigeration plants, and needs to be located at the midpoint of Goethals Substation and the Bay Street plant. Acquisition of the property has not been completed. The property must be procured to accommodate the service date of May 2016.

III. Interconnection Status:

On January 18, 2013, NYISO pronounced, per Section 2.4.2 of the NYISO Transmission Expansion and Interconnection Manual, that a System Impact Study is not required for the proposed modifications.[7]

IV. Permits:

The following sets forth a preliminary list of major Federal, State and Local permits/approvals which are expected to be filed (additional permits may also be required). These filings and reviews will take approximately six months to one year to complete. The exact timeframe would be determined through a pre-application conference with the U.S. Army Corps of Engineers (USACE), the New York State Department of Environmental Conservation

[7] The Staten Island Un-bottling project is contingent on the use of the Co-Gen position at the Linden Substation.

(NYSDEC), and the New Jersey Department of Environmental Protection (NJDEP), to discuss the project and confirm permitting requirements.

1. U.S. Army Corps of Engineers (USACE):
    a. Permitting is needed for the new cable installation beneath the Federally-regulated water body (Arthur Kill) and through the Federally-regulated wetlands
    b. Potential USACE permits needed:
        i. USACE Nationwide Permit (NWP) 12, which is only applicable for activities that have minimal adverse effects on the environment
        ii. USACE Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act
            1. An individual permit would trigger an environmental impact review under the National Environmental Policy Act (NEPA)
2. Article VII Exemption and Individual Permits: The PSC issued a Declaratory Ruling in November 1990 allowing the Cogen Tech interconnection to be exempt from the Article VII process. This 1990 determination would need to be reconfirmed with the PSC for the new parallel feeders to be installed.
    a. If the new Staten Island Transmission Upgrade is also exempt from Article VII, individual permits would need to be filed and an environmental impact review would need to be conducted under the Federal National Environmental Policy Act (NEPA) and NY State Environmental Quality Review (SEQR) process.

b. Potential individual permits needed:

i. NYSDEC Environmental Conservation Law Article 15 (Use and Protection of Waters) and Article 25 (Tidal Wetlands)

ii. NYSDEC and NJDEP State Pollutant Discharge Elimination System (SPDES) Stormwater Pollution Prevention Plans (SWPPPs) for the new cable installation in the bed of the Arthur Kill and State-regulated wetlands

iii. NJDEP Waterfront Development Law, Wetlands Act

iv. City of New York and City of Linden construction-related approvals triggered by the new cable installation

v. NJ Turnpike Authority permits, dependent on the route of the parallel feeders

3. NYC Zoning/Land Use Approval:

a. Land use approval needed for cooling plants proposed outside existing Con Edison substations and Linden Cogen facilities

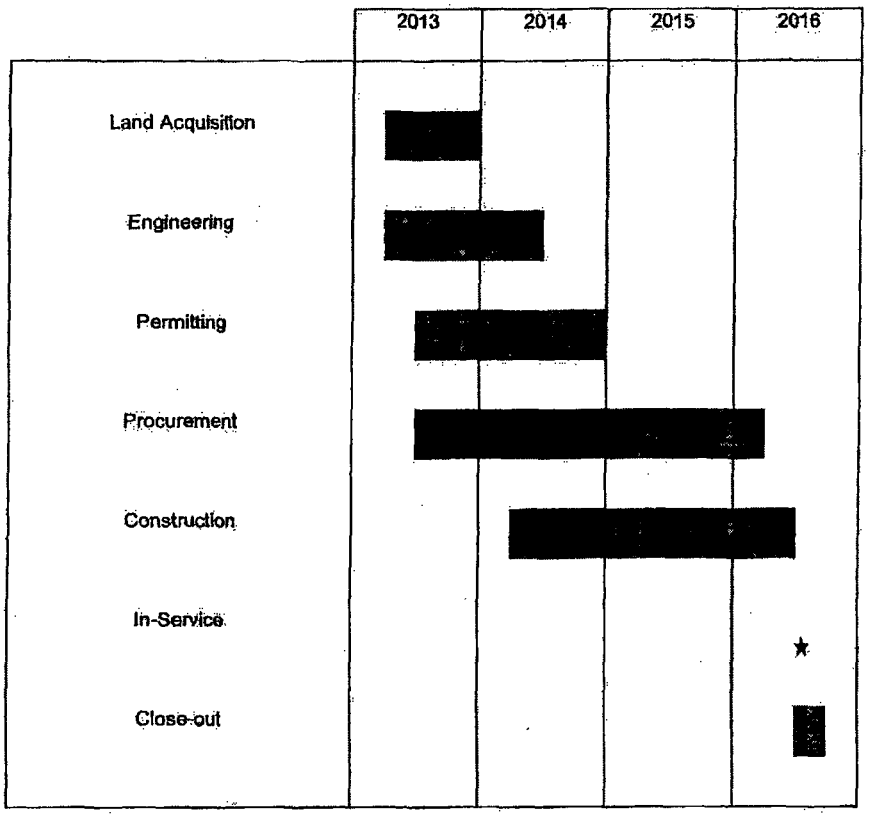
b. An application will need to be filed with the NYC Board of Standards and Appeals (BSA) and the local Community Board. An environmental impact review will also need to be submitted under the City Environmental Quality Review (SEQR as implemented by NYC)

c. Once the approval process has been completed, Con Edison would need to apply for and obtain the necessary NYC construction approvals

V. Estimated Service Date:

The proposed service date is May 2016.

VI. Estimated Project Schedule:



VII. Preliminary Cost Estimate (2016 dollars): $312 million

Redacted

Exhibit E

RFP Respondent Information

RFP Respondent Information

Respondents to the RFP will be required to provide relevant information which may include the following information:

- Cover Letter
  Statement that Respondent's proposal meets following Threshold Criteria
  i. Statement that pricing is firm through December 31, 2013
  ii. COD deadline of June 2016
  iii. Project provides incremental generation capacity and/or transmission capacity (i.e. not included in the 2012 Reliability Needs Assessment)
  iv. Generation project provides a minimum of 75 MW (UCAP)
  v. Point of injection and withdrawal (transmission) or interconnection (generation)
  vi. Signed by individual authorized to bind the Respondent contractually

- Contact Information:
  Proposals must contain:
  i. Company name, address and telephone number (including name, address, telephone number, and e-mail address of the contact person for Respondent in connection with its Proposal)
  ii. Legal status
  iii. Ownership status
  iv. Guarantor information
  v. For consortium proposals the consortium must provide information on its legal form, similar information as above for each member, and identify the Lead Member (the member responsible for providing all financial security, executing the resulting contracts, and providing proposed products)

- Project Team & Experience:
  Respondents should provide information demonstrating competence and experience in developing, managing, and operating similar types of projects. Proposal must detail:
  i. Business and history
  ii. A description of the project management team
  iii. Experience in developing, financing, constructing, and operating electric generating plants and/or transmission facilities
  iv. Familiarity and experience with NYISO requirements and its membership status with the NYISO and/or commitment to become a member
  v. Existing electric facilities owned and/or operated by Respondent—including size, COD, location
  vi. Respondent's financial condition and creditworthiness.
    a. NYPA will enter into an NDA with Respondents whose financial statements are not public
  vii. Financing plan

- Disclosure Statements
  Proposals must contain disclosure of any instances in the last five years where Respondent, any of its officers, directors or partners, any of its affiliates, or its proposed guarantor (if any):
  i. Defaulted on, or was deemed to be in noncompliance with, any obligation related to the sale or purchase of power (capacity, energy and/or ancillary services), transmission, or natural gas, or was the subject of a civil proceeding for conversion, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement- or sale-related irregularities; or
  ii. Was convicted of (i) any felony, or (ii) any crime related to the sale or purchase of power (capacity, energy and/or ancillary services), transmission, or natural gas, conversion, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement- or sale-related irregularities.

- Financial Capacity to Complete and Operate the Proposed Project
  i. Provide a detailed description of proposed short- and long-term financing arrangements. A list of all equity partners, sources of equity and debt, debt structure.
  ii. Demonstrate that financial arrangements from Respondent's parent or affiliate are sufficient to support the project through construction and the contract term.
  iii. Describe proposed capital structure for the project.
  iv. A schedule showing all major projects developed and financed by Respondent in the past 10 years.
  v. Provide details of any events of default or other credit issues associated with all major projects listed above.
  vi. Identify proposed guarantor(s) for the Project and provide documentation of the guarantor's creditworthiness including the three most recent audited financial statements of the guarantor).
  vii. Provide information concerning the Respondent's financial condition and evidence of creditworthiness including:
    a. Audited financial statements for its three most recent fiscal years; or
    b. Audited financial statements from Respondent's parent, if Respondent does not have such financial statements; or
    c. Statement describing why the statements in either i) or ii) cannot be provided and provide alternate information to demonstrate Respondent's financial capacity to complete and operate the proposed project.
  viii. Include four references from prior projects developed by the Respondent that employed financing arrangements similar to the arrangements contemplated by the Respondent for the project

- Project Specific Information:
  For all proposed projects provide a project implementation plan, including detailed schedule, and give a general overview of all aspects of the plan from commencement of construction to testing and commissioning of the Project. Please include:

  i. Timelines for selection and award of Engineering, Procurement and Construction agreements
  ii. Timelines for fabrication and procurement of equipment requiring significant lead times, or demonstration that such activities can be timely completed
  iii. Equity and debt financing plans;
  iv. EPC Contractor experience (if available);
  v. Other Contractors experience (if available);
  vi. A description of how the project will interconnect with the NYS Bulk Power Transmission Facilities
  vii. If applicable, a description of the rights of way to be used or acquired
  viii. If applicable, the thermal capacity and impedance ratings of the line
  ix. The required substation and protection additions or modifications required including a list of major equipment and their ratings
  x. Status of site control and a description of the property that would need to be acquired for the project
  xi. A list of anticipated Electric System Upgrade Facilities
  xii. Status of the project in the NYISO's Interconnection Queue
  xiii. A major milestone schedule

  For generation projects –
  a. Complete detailed generation data sheet
  b. Project location
  c. Project size in MW (Note: projects must be a minimum of 75 MW (UCAP)
  d. Fuel Supply plans;
  e. Access to and interconnection with gas pipeline facilities;
  f. Identify and describe any manual or automated fuel switchover capability;
  g. Gas supply and transportation; and
  h. For projects having non-firm gas transportation: Fuel oil storage for a minimum 5 days of continuous full power operation including plans for liquid fuel procurement, supply and transportation

  For transmission projects –
  a. Complete detailed transmission data sheet
  b. Points of withdrawal and injection
  c. Site plan
  d. System area one-line
  e. Detailed substation one-lines
  f. Substation plot plans
  g. Transmission route plan

- Environmental and Permitting:

i. A list of all regulatory approvals required from state, federal and local licensing and environmental regulatory agencies, and a schedule for applications and expected regulatory approvals
ii. If planning to permit project under SEQRA, statement of how project qualifies under SEQRA rather than Article 10
iii. Environmental impact impacts and externalities
    a. Emissions (NOx, SO2, CO2)
    b. Cooling water
    c. Land use impact
iv. Environmental justice issues

- Contract Exceptions
    i. Provide a detailed list of all contract exceptions
    ii. Provide a redline Word document markup of NYPA draft contract relevant to project

- Project Costs:
    i. Respondents will submit detailed capital cost estimate breakdowns, including a proposed spending schedule, for each segment of the project and must include the following at a minimum:
        a. Licensing/permitting
        b. Engineering
        c. Construction labor
        d. Major equipment
        e. Real estate acquisitions and rights of ways
        f. Overheads
        g. Contingencies
    ii. Description of project assumptions used for the basis of the project capital costs
    iii. Halting costs
        a. Dates and spending thresholds according to a schedule that will be defined in the RFP

- Pricing:
  For transmission projects, Respondents will provide a single price (in $/month) to cover the full term. In addition, provide a list of assumptions used in calculating the pricing, which shall include but not be limited to:
    i. Cost of capital
    ii. Annual operations and maintenance costs
    iii. Property Taxes
    iv. Escalation rate

  For generation projects, Respondents will submit pricing in two forms.
    a. The first will be in the form of a contract for differences ("CFD") in which the total cost of the project is fixed, but the monthly payment due will be reduced by the amount of the market revenues available to the project for that month. Pricing must be in total dollars per month.

b. The other required bid form will be as a contract that states the fixed amount that the project developer requires on a dollar per month basis for support in addition to the market revenues it expects to realize. This is similar to the approach employed in the Renewable Portfolio Standards venue.

In addition, provide a list of assumptions used in calculating the pricing, which shall include but not be limited to:

a. Cost of capital
b. Annual operations and maintenance costs
c. Property Taxes
d. Escalation rate

- Community outreach plan:
  Respondents should provide the following:

  i. A detailed description of Respondent's planned approach to managing the potential impact on affected communities and interested parties.
  ii. A description of any community outreach activities that Respondents have conducted prior to submitting its proposal in this RFP.
  iii. In the event that Respondent's proposal is selected, a description of Respondent's planned activities after selection and how it would coordinate such activities with Con Edison/NYPA, including:
    a. A description of the plan for educating affected communities about the Project.
    b. Plan to secure community input about Project on an ongoing basis.
    c. Plan to integrate community needs and concerns into Project planning.
    d. Plan for using local labor and materials.
    e. An explanation of the economic development opportunities associated with Project to the community.
    f. Plan to prepare mitigation plan associated with local siting and permitting issues for community review.

- Minority/Women-Owned Business Enterprise
  - Description of the approach for use of NY State certified M/WBEs in connection with the project

- Economic development benefits:

Respondents should describe the following:

i. Impact of the project on the State and local economy.
   - Construction jobs
   - Long term jobs

Exhibit F

RFP Contract Terms

Major RFP Contract Terms

The RFP will include a form of PPA that includes standard commercial terms and conditions. Set forth below is a listing of indicative provisions that will be included, with special attention to proposed milestone dates. We anticipate that the September Order will impose similar terms and conditions any Selected Transmission Projects.

i. General Definitions
ii. Representations and Warranties
iii. Obligations and Deliveries
iv. Remedies for Failure to Deliver or Receive
v. Payment Provisions
vi. Credit and Collateral Provisions Related to Achieving Milestones and ICAP Obligations
vii. Project Milestones
    a. Design Completed
    b. Site Studies and Surveys Completed
    c. NYISO Feasibility Study Completed
    d. NYISO Impact Study Completed (SIS or SRIS)
    e. NYISO Facilities Study Completed
    f. Posting of Security for SUF and SDU Costs
    g. Interconnection Agreement Executed and Filed at FERC
    h. Permit Applications Submitted
    i. Permitting and Regulatory Approvals Received
    j. Construction Contract Executed
    k. Notice to Proceed Issued
    l. Interim Construction Milestones Achieved
    m. Commercial Operation Achieved
viii. Halting Mechanism and Cancellation Cost Recovery
ix. Confidentiality Provisions
x. Indemnity
xi. Limitations on Liability
xii. Force Majeure

Exhibit G

Ongoing Demand Reduction Initiatives

Con Edison has also been collaborating with its partners at NYPA and NYSERDA to identify incremental EE, DR, and CHP initiatives over and above what is already included in the 2012 RNA that can be achieved prior to the In-Service Deadline. There exists a combination of programs with funding that is not currently included in the Updated 2012 RNA which is still being reconciled.[8] The Plan will ultimately incorporate these during the evaluation process that determines the final set of transmission and generation solutions.

In late 2012, Con Edison expanded its Targeted DSM program, offering incentives to retain steam air conditioning ("AC") customers in targeted electric networks which will result in 8 MW of incremental peak load reduction by 2016.

NYPA has been working with several New York City and State Agencies, including those affected by Governor Cuomo's recently announced Executive Order 88 "Build Smart NY," to identify incremental demand reductions based on long term capital planning and expects to achieve an additional 15 MW peak demand reductions not accounted for in the 2012 RNA (some projected achievements from Build Smart NY are already included in the 2012 RNA). This represents work associated with aeration and de-watering system upgrades at wastewater treatment plants in New York City as well new efficiency opportunities identified in master energy plans that are envisioned for university campuses in New York City. Equipment at many of the wastewater treatment plants has outlived its useful life and there has been significant advancement in the technology that can be employed to further reduce high level energy consumption at these facilities. Campus-wide ASHRAE Level II audits will help identify capital energy efficiency retrofits. In addition to energy efficiency measures, the audits will help to

[8] The impact could be as much as 88 MW once the programs in-progress are fully identified and accounted for. These programs are in addition to the 100 MW incremental demand reduction to be achieved through the IPEC EE/DR Program.

identify opportunities for cost effective on-site renewable generation and potential for combined heat and power projects. Additionally, NYPA has been working with customers to install CHP projects and expects that 15 MW will be placed in service by the In-Service Deadline.

Lastly, NYSERDA has also identified that an additional 50 MW of incremental demand reduction can be attributable to existing CHP initiatives expected to be in service by the In-Service Deadline. These projects are already approved and funded under existing CHP avenues in the SBC and Technology and Market Development programs.

Together, Con Edison, NYPA, and NYSERDA have identified these 88 MW of demand reductions as already underway, but not previously reflected in the NYISO's 2012 RNA and may serve to mitigate the reliability need.

conEdison
a conEdison, Inc. company

Neil H. Butterklee
Assistant General Counsel

May 20, 2013

VIA E-MAIL
Honorable Jeffrey C. Cohen
Acting Secretary
State of New York
Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

Re: Case 12-E-0503 – Con Edison Filing of Supplemental Information Regarding its Ramapo to Rock Tavern Project

Dear Acting Secretary Cohen:

On February 1, 2013, in response to a November 30, 2012 order from the Public Service Commission ("Commission") in this proceeding, Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") and the New York Power Authority ("NYPA") filed their Indian Point Contingency Plan ("Plan"), which included a proposal to build three Transmission Owner Transmission Solutions ("TOTS") as well as a plan for NYPA to issue a request for proposals ("RFP") for third party transmission and generation solutions. The Plan contained significant details regarding the three TOTS. In the Commission's March 15, 2013 Order in this proceeding (the "March 15th Order"), the Commission required Con Edison and NYPA to supplement the description of their TOTS with additional information so that the level of information submitted by Con Edison and NYPA to the Commission was comparable to the level of information requested from third party respondents to the NYPA RPF. Accordingly, Con Edison hereby files its supplemental information with respect to the second Ramapo to Rock Tavern ("RRT") 345 kV line project.

As indicated in the Plan and in the accompanying materials, the RRT project is a new resource that interconnects within New York Independent System Operator ("NYISO") load zone G and can be in service by June 2016. The RRT project meets the requirements necessary to be a solution for the retirement of the Indian Point Energy Center ("IPEC"). In addition, this

Consolidated Edison Company of New York, Inc.
4 Irving Place – Room 1875-S New York, NY 10003 212 460 1089 212 677 5850 fax butterkleen@coned.com

project provides significant additional benefits beyond transmitting replacement energy in the event that the IPEC retires.

Consistent with the requirements of the March 15th Order (p.18), the project costs described in this filing represent a good faith preliminary engineering estimate for the project. That being said, it is possible that the project costs may change as project details are further defined.

Please feel free to contact me if you have any additional questions.

Very truly yours,

/s/ Neil H. Butterklee

Consolidated Edison Company of New York, Inc.

Additional Information on Transmission Owner Transmission Solution for Indian Point Contingency Plan:

Second Ramapo to Rock Tavern 345kV Line Project

May 20, 2013

Contents

Exhibits

Exhibit A: One-line Diagrams of the RRT project

Exhibit B: Attachment 5 of NYPA RFP – Financial Data Sheet

Exhibit C: Attachment 7 of NYPA RFP – Pricing Data Sheet

Exhibit D: Attachment 3 of NYPA RFP – Transmission Project Data Sheet

Exhibit E: Con Edison policy statements

8.2 Executive Summary

As shown herein, the New York State Public Service Commission ("Commission") should select Consolidated Edison Company of New York, Inc.'s ("Con Edison" or the "Company") Second Ramapo to Rock Tavern ("RRT") 345 kV line project as one of the solutions in this proceeding for the following reasons:

1. The project can be delivered by the June 2016 deadline and has a clear head start because it has its transmission siting approval and will be built along existing rights-of-way ("ROW"), using existing transmission towers;
2. The project addresses the needs that would exist if the Indian Point Energy Center ("IPEC") were to retire and provides significant benefits throughout the State if the IPEC does not retire;
3. Its estimated costs are reasonable; and
4. The project addresses the numerous public policy needs specified in the Governor's *New York Energy Highway Blueprint* ("Blueprint").[1]

On February 1, 2013, in response to a November 30, 2012 order from the Commission in this proceeding, Con Edison and the New York Power Authority ("NYPA") filed an Indian Point Contingency Plan ("Plan"), which included a proposal to build three Transmission Owner Transmission Solutions ("TOTS") as well as a plan for NYPA to issue a request for proposals ("RFP") for third party transmission and generation solutions. One of the TOTS is Con Edison's RRT project.

The RRT project will establish a second 345kV line from Con Edison's Ramapo 345kV substation to Central Hudson Gas and Electric Corporation's ("CH") Rock Tavern 345kV substation. The project will increase the import capability into Southeastern New York ("SENY"), including New York City, during normal and emergency conditions and will provide a partial solution for system reliability should the IPEC retire. The project will be located in Orange and Rockland Counties in New York along the existing ROW of the existing Con Edison 345kV Feeder 77 (Ramapo to Rock Tavern) and using existing transmission towers. The transmission line terminals are located in New York Independent System Operator ("NYISO") zone G. In addition to Con Edison, this project involves work that will be performed by Orange & Rockland Utilities ("O&R") and CH; as such, the Company has been and will be actively coordinating this effort with both O&R and CH.

---

[1] A copy of the Blueprint can be found at: http://www.nyenergyhighway.com/PDFs/Blueprint/EHBPPT/.

As indicated in the Plan and in the accompanying materials, the RRT project is a new resource that can be in service by June 2016. A significant part of the Company's ability to deliver the RRT project within the specified timeframe is due to the fact that the RRT project already has its transmission siting approval and a completed and approved NYISO System Impact Study ("SIS") and will utilize the existing ROW and transmission towers along the existing transmission route from the Ramapo to the Rock Tavern 345kV substations. No additional land rights are required to construct the substation upgrades at either the Ramapo substation or the Rock Tavern substation in order to connect the new 345kV line.

The current good faith cost estimate for the RRT Project is $123.1 million. While this project is being submitted by Con Edison, it is anticipated that the RRT project will be owned by the New York Transmission Company, LLC ("NY Transco") and will be one of several Federal Energy Regulatory Commission ("FERC") regulated transmission projects owned by NY Transco. As such, the rates for this project will be based on a cost of service rate and, consistent with the requirements of the March 15th Order, will not be based on a fixed price nor will it be a merchant transmission facility. As the Commission recognized in its March 15th Order, "[w]e understand the TOTS cost estimates to be good faith estimates, rather than 'not to exceed' values."[2] While the Commission directed Staff to "evaluate TO and RFP projects on as comparable a basis as possible, it is neither necessary nor appropriate to provide identical cost recovery provisions for each."[3] It is anticipated that once it is in service, the RRT facility will be under the operational control of the NYISO and its rates included in the NYISO's Open Access Transmission Tariff ("OATT").

Along with the other transmission projects proposed by the NY Transco in PSC Case No. 12-T-0502, the RRT Project is being proposed in order to accomplish the goals and objectives of the Commission's November 30, 2012 *Order Instituting Proceeding* ("AC Order") in Case 12-T-0502,[4] as well as its November 30, 2012 *Order Instituting Proceeding And Soliciting Indian Point Contingency Plan* ("IP Order"), in Case 12-E-0503.[5] In the AC Order, the Commission sought transmission projects that increase transfer capability across the Central East and Upstate New York ("UPNY-SENY") interfaces.[6] In the IP Order, the Commission sought solutions that could

---

[2] March 15 Order, p.18.
[3] *Id.*
[4] Case 12-T-0502, *Proceeding on Motion to Examine Alternating Current Transmission Upgrades.*
[5] Case 12-E-0503, *Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans.*
[6] AC Order, p. 2.

address the need that would result if the IPEC were to retire. Both of these orders seek transmission solutions to meet the objectives of the Blueprint. Specifically, the state-wide benefits associated with upgrades to an interconnected transmission system were recognized in the Blueprint, which stated that:

> Ensuring the efficient transmission of power by reducing bottlenecks and developing advanced smart technologies improves overall electric system operation and optimizes the use of existing assets in New York by allowing lower-cost and cleaner power to reach consumers. Investments in the transmission and distribution systems can reduce customer costs over the long-term, improve safety and reliability, and protect the environment while immediately creating jobs and economic development.[7]

The Federal Courts have also found that "[w]hen a system is integrated, any system enhancements are presumed to benefit the entire system." *W. Mass Electric Co. v. FERC*, 165 F. 3d 922, 927 (D.C. Cir. 1999). The RRT project will clearly enhance the state-wide interconnected transmission grid. As described in this submission as well as in the Plan and in the NY Transco's January 25, 2013 filing in Case 12-T-0502, this project will significantly reduce constraints over key transmission interfaces, enhance the long term reliability of the state-wide interconnected transmission grid and provide the additional public policy benefits specified in the Blueprint. Among the public policy goals that the RRT project will contribute to is an increase in economic development within New York State, including increased employment and increases in local tax revenues. The RRT project will also increase the transfer capability into the NYISO's proposed Lower Hudson Valley ("LHV") new capacity zone ("NCZ"), thereby helping to create a convergence in capacity prices between the LHV NCZ and the rest-of-state capacity prices.

The RRT project is a "no regrets" solution to the retirement of the IPEC, meaning that the RRT line makes sense from a public policy point of view even if the IPEC were not to retire. The RRT project does not degrade the New York Transmission System. Pursuant to the approved SIS, the RRT project substantially increases the transfer capability of the independent UPNY/ConEd interface by 1,425 MW (or by 26%) for the normal transfer limits and 2,780 (or by 34%) increase in the Emergency transfer limit. In addition, the RRT Project also increases the transfer capability of the independent UPNY-SENY interface (by 120 MW under normal conditions and by 135 MW under emergency conditions) and of the independent Total East

---

[7] Blueprint, p. 10.

Interface (by 60 MW under normal conditions and by 65 MW under emergency conditions). **[Redacted]**.

Accordingly, the RRT project will provide benefits beyond its ability to replace some of the energy and capacity should the IPEC retire. It is clear that the RRT project will provide significant public policy benefits throughout New York State.

8.3 Description of Project

The Project will establish a second 345kV transmission line from the Con Edison Ramapo 345kV substation to the CH Rock Tavern 345kV substation. The project will increase the import capability into SENY, including New York City, during normal and emergency conditions and will provide a partial solution for system reliability should IPEC retire. The project will be located in Orange and Rockland Counties in New York along the existing ROW of the existing Con Edison 345kV Feeder 77 (Ramapo to Rock Tavern), using existing transmission towers; as such, the project is expected to have minimal environmental impact. An environmental review will be conducted through the Environmental Management and Construction Plan ("EM&CP") process as discussed in more detail in this document. The transmission line terminals are located in NYISO zone G.

CH's Rock Tavern 345kV substation will be connected to Con Edison's Ramapo 345kV substation by performing three concurrent system upgrades. The first upgrade would convert O&R's Feeder 28 (Ramapo 138kV substation to Sugarloaf 138kV substation) from its current operating voltage of 138kV to 345kV by reconnecting Feeder 28 at the Ramapo 345kV substation.[8] The second upgrade would be to create a Sugarloaf 345kV substation and add a 345 / 138kV step-down transformer between the Sugarloaf 345kV and 138kV substations. The third upgrade would be to install a 345kV line between Rock Tavern and the Sugarloaf 345kV substation utilizing bundled 1590 ACSR (2 x 1590 ACSR) conductor. A one-line diagram of the RRT project is included in Exhibit A.

The impact of the RRT project towards reducing N-1/-1 deficiency post Indian Point shutdown is about 100 MW. This impact is based on an application of the NYC Reliability Criteria. In general, transmission projects, such as RRT, will have an interaction with other transmission or generation projects that can be either positive or negative (*i.e.*, the stated

---

[8] The Feeder 28 project is currently under development with O&R, and is expected to be in service in spring 2014. Please refer to Exhibit A for a one-line description of how these two projects will likely be coordinated.

impact may increase or may decrease). Therefore, it is critical that when a comprehensive portfolio analysis is conducted the impact of this project be re-calculated. For example, due to these synergistic effects, when combined with NYPA's Marcy South Series Compensation Project ("MSSC"), the two projects would provide approximately 480 MW towards reducing N-1/-1 deficiency post IPEC shutdown.

8.4 Proposer Experience

Con Edison and O&R are regulated public utilities that are subsidiaries of Consolidated Edison, Inc. ("CEI"), a holding company and a New York Stock Exchange company. In 2012, CEI had $41.2 billion in assets and $12.2 billion in revenues (please see CEI's 2012 annual report). Con Edison serves a 660 square mile area with a population of approximately ten million people. In that area, Con Edison serves approximately 3.3 million electric customers, 1.1 million gas customers, and 1,700 steam customers. Con Edison provides electric service in New York City and most of Westchester County, gas service in parts of New York City and steam service within the borough of Manhattan. Con Edison has approximately 1,180 circuit miles of transmission, including 438 circuit miles of overhead and 742 circuit miles of underground transmission.[9] Con Edison was incorporated in New York State in 1884 and its corporate predecessor, the New York Gas Light Company was founded in 1823.

O&R and its utility subsidiaries, Rockland Electric Company and Pike County Light & Power Company, operate in Orange, Rockland and part of Sullivan counties in New York State and in parts of Pennsylvania and New Jersey, and serve a 1,350 square mile area. O&R provides electric service to approximately 300,000 customers and gas service to approximately 100,000 customers in southeastern New York and in adjacent areas of northern New Jersey and northeastern Pennsylvania. O&R has approximately 558 circuit miles of transmission.

Con Edison is a voting member and O&R is a non-voting affiliated member of the Transmission Owners sector of the NYISO. As transmission owners in New York, Con Edison and O&R helped to create the NYISO and its markets. As the utility responsible for providing electric, gas and steam service to the New York metropolitan area, Con Edison has developed numerous projects over the last ten years, all focused on providing safe, reliable and efficient service to its customers. Recently, Con Edison constructed and put into service the M29

---

[9] A list of Con Edison's and O&R's transmission and generation facilities can be found in the *2013 Load and Capacity Data, A Report by the New York Independent System Operator "Gold Book,"* which is located at:
http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2013_GoldBook.pdf.

transmission line. Both Con Edison and O&R have extensive environmental permitting experience gained through projects like the M29 transmission line and the Feeder 28 project currently underway.

With respect to project management, work on the RRT project will initially be managed by Con Edison engineers and project management professionals. Most of the work will be conducted by outside engineering and construction firms.

8.5 Project Information

Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, New York 10003
Attn: Stuart Nachmias
Vice President, Energy Policy and Regulatory Affairs
Tel: 212-460-2580
Email: nachmiass@coned.com

Attn: Neil H. Butterklee, Esq.
Assistant General Counsel
Tel: 212-460-1089
Email: butterkleen@coned.com

It is anticipated that, while Con Edison will commence development of the RRT project, it will transfer the project, as soon as it is able to do so, to NY Transco, a New York limited liability company proposed to be formed in July 2013 and co-owned by the following entities or their newly formed special purpose affiliates (subject, in the case of the public authorities, to the enactment of legislation enabling their participation): Con Edison/O&R, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid"), New York State Electric & Gas Corporation and Rochester Gas & Electric Corporation (together, "NYSEG/RG&E"), NYPA, Long Island Power Authority ("LIPA"), and CH (collectively, the "NYTOs").

Con Edison's DUNS Number is 006982359.

Development of the project will require work by other utilities: specifically, O&R will perform work to develop and construct a new Sugarloaf 345 kV substation (in the town of Chester, Orange County), which will connect to the existing Sugarloaf 138 kV substation via a 345 kV step-down transformer, and CH will perform incremental physical reinforcements to its

Rock Tavern substation (in the town of New Windsor, Orange County). Con Edison expects to actively coordinate its work with that of O&R and CH.

8.6 Disclosure Statements

Neither Con Edison nor any of its affiliates have, during the past five years, been judged or found by any court or administrative or regulatory body to have defaulted on or failed to comply with any material obligation related to the sale or purchase of power (capacity, energy and/or ancillary services), transmission or natural gas.

Neither Con Edison, nor any of its trustees or "executive officers" (as defined by Rule 3b-7 promulgated under the Securities Exchange Act of 1934, as amended) or affiliates have, during the past five years, been convicted of (a) a felony, or (b) any crime related to the sale or purchase of electric power (capacity, energy and/or ancillary services), transmission or natural gas, conversion, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement or sale-related irregularities.

8.7 Financial Capacity to Complete and Operate the Proposed Project

The Company has completed the Financial Data Sheet, included as Attachment 5 to the NYPA RFP and attached hereto as Exhibit B, with respect to the project. As discussed further below, the Exhibit assumes that the RRT project will be transferred to NY Transco around spring 2014 and subsequently developed and financed by NY Transco.

Prior to its transfer to NY Transco, Con Edison will finance construction of the RRT Project in the same way that it currently finances its capital needs: by issuing long-term debt in the capital markets. Debt financing at Con Edison must be approved by the Commission via a financing order. Under the Company's current financing order, Con Edison has authorization to issue $3.5 billion of debt through December 2016. In addition, the Company's financing may be limited by the capital structure approved by the Commission. The Company currently has an approved equity ratio of 48%. Funding for the RRT project will take into consideration the Company's approved equity ratio.

Information concerning Con Edison's financial condition may be obtained upon review of the Company's audited financial statements, which are available publicly and accessible on the Company's website, at www.conedison.com or on the Securities and Exchange Commission's website, at www.sec.gov/edgar. The Company's unsecured debt is rated A3, A- and A-, respectively, by Moody's Investor Service, Inc. ("Moody's), Standard & Poor's

Corporation ("S&P") and Fitch Ratings, Inc. ("Fitch"). CEI's long-term credit rating is Baa1, BBB+ and BBB+, respectively, by Moody's, S&P and Fitch. The commercial paper of both the Company and CEI is rated P-2, A-2 and F-2, respectively, by Moody's, S&P and Fitch. Securities ratings assigned by rating organizations are expressions of opinion and are not recommendations to buy, sell or hold securities, and may be revised or withdrawn at any time by the assigning rating organization. Each rating should be evaluated independently of any other rating.

Accordingly, Con Edison expects to transfer the RRT project to NY Transco as promptly as possible upon the commencement of its operations (which is anticipated to occur following (i) enactment of necessary legislative changes and procurement of approvals, if applicable, of the Comptroller and/or Attorney General of the State of New York with respect to NYPA and LIPA's participation, as well as (ii) receipt of approvals by FERC of a transmission formula rate schedule and incentives, and (iii) implementation of cost allocation and cost recovery mechanisms through the NYISO's tariff, all of which are expected by the middle of 2014). It is expected that NY Transco will be able to obtain investment grade construction debt financing once its rate is approved by FERC, and that NY Transco will also receive certain FERC incentives, including construction work in progress, that will reduce construction risk. Equity support will be provided to the Transco by the NYTO's investing affiliates during construction and, to the extent necessary, thereafter to support continued operations. It is anticipated that the NY Transco will make its formula rate filing at FERC during the summer of this year. As such, it is premature to specify the exact debt / equity ratio that will be approved by FERC for this project. However, for informational purposes a 50/50 debt to equity capital structure is assumed in Exhibit B.

8.8 Environmental Benefits of Project

The project's primary objectives are to meet the public policy goals stated in the Blueprint including: reducing congestion over the UPNY/SENY interface, providing economic benefits to local communities, encouraging renewables, enhancing the long-term reliability of the bulk power system and planning for a possible IPEC retirement. By increasing transfer capability on constrained interfaces into the Southeast New York area, the project will allow high load density areas, such as New York City and parts of the Lower Hudson Valley greater access to generation resources in upstate New York.

Because the RRT project will be located on an existing ROW using existing transmission towers, no additional vegetation management work would be needed for this project. As such, the project minimizes the environmental impacts on neighboring communities.

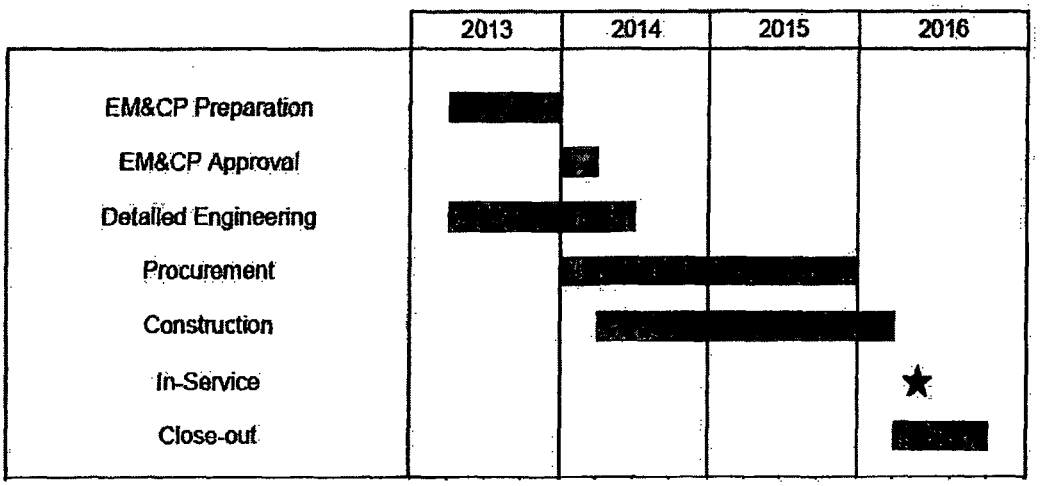
The RRT project is not expected to reduce emissions in the near term when added to the current New York State resource mix, which would remain largely unchanged by year 2016 when the project comes into service. However, the project will provide appreciable environmental benefits to New York State in the future by enabling renewable energy deliverability from favorable wind sites in upstate New York into high load density areas downstate, thereby facilitating the development and integration of additional wind generation in New York State and helping realize a cleaner resource mix.

The New York State Transmission Assessment and Reliability Study ("STARS"), which issued its Phase II technical report on April 30, 2012, envisioned a future resource mix that incorporates 6,000 MW of wind capacity in upstate New York by the year 2030. The STARS report evaluated a portfolio of transmission upgrades intended to improve system reliability and deliverability, and ultimately reduce congestion costs. The RRT project was among the projects studied. The STARS report estimated that adding the RRT project to other upgrades in the portfolio resulted in notable incremental benefits, one of which is a reduction of approximately $2 million in emission costs, or the equivalent of approximately 40,000 tons in CO_2 emissions, over the study year.

8.9 Proposed Resource(s) Development Plans and Schedule

The following represents the current high-level schedule and work plan for the development of the RRT Project.

MS Project Gant Chart



Proposed In-Service Date May 2016

No contracts with NYPA are necessary to achieve this in-service date.

Proposed Date for PSC and FERC Orders to Achieve In-Service Date

The following represent the proposed dates for key PSC and FERC approvals that are necessary to achieve the June 2016 in-service date.

1. PSC selection in Case 12-E-0503 – September 2013
2. PSC approval of EM&CP and amendment of existing Article VII – 1st Quarter 2014
3. FERC approval of NY Transco formula rate – mid 2014
4. FERC approval of NY Transco incentives – mid 2014
5. FERC approval of cost allocation for NY Transco – mid 2014
6. PSC approval of Section 70 asset transfer filing – 4th Quarter 2014

Timeline for Award of Engineering, Procurement, Construction ("EPC") Contract

The EPC Contract will be performed in phases. The first phase, engineering, will be awarded by the third quarter of 2013. It is anticipated that CH will be responsible for the work at the Rock Tavern substation.

Lead Times for Major Equipment

- The following are the lead times for major equipment:
  - 1590 ACSR Conductor = **[Redacted]**
  - 345 / 138kV Transformer = **[Redacted]**
  - 345kV Open Air Bus = **[Redacted]**
  - 345kV Breakers = **[Redacted]**

Plans for Construction and Operation

The construction work is expected to be performed by an EPC contractor. Once the project is operational, Con Edison, O&R and CH may perform operation and maintenance ("O&M") services for the NY Transco with respect to the Project in accordance with the terms of an O&M Agreement between the parties and consistent with the affiliate rules of the Commission and FERC. Similar to other transmission assets in the State, the line will be under operational control of the NYISO.

Community Outreach Plans

The second RRT project is in the same transmission ROW and on the same towers as the recently approved O&R Feeder 28 project. The outreach plan for the RRT project will follow a similar approach to what was done for Feeder 28. For Feeder 28, O&R met with elected officials in each of the municipalities to brief them on the project, and communicated directly with adjacent property owners to notify them of the project and the associated vegetation management. Prior to the start of the RRT project, O&R will meet with elected officials in each of the communities that the 345kV line will pass through to notify them of the project. O&R will provide each property owner adjacent to the transmission ROW with a written letter/fact sheet explaining the project. During the project, updates will be provided to property owners adjacent to the line as necessary. O&R will provide contact information for individual concerns to be raised and coordinate with the affected party or parties to resolve the issues.

Equity and Debt Financing Plans

Please see description of financing plans in section 8.7.

Contractor Experience

This information is not yet available, as the EPC and other contractors have not yet been procured for this project. It is expected that contractors with appropriate experience and expertise will be hired at a reasonable cost.

Community Benefits

Please see the response to section 8.14 dealing with the RRT project's economic development benefits.

Taxes and/or PILOT agreements

The RRT project will run through several distinct municipalities and over both public and private lands. Because transmission lines are real property under the New York State Real Property Tax Law, the Company expects that local property taxes will be levied with respect to this facility by each municipality in which the line runs over private lands and to New York State where the line runs over public land. Although property taxes throughout the state are generally based on the property's reproduction cost new less depreciation, rates vary significantly from jurisdiction to jurisdiction as well as from year to year, and therefore cannot be predicted with certainty. A generic assumption was used for estimating property taxes in the financial data sheet included in Exhibit B.

Site Control Status and Plans for Site Control

The following represents the site control plan for the RRT project:

- The project will affect three substations, Ramapo (owned by Con Edison), Sugarloaf (owned by O&R), and Rock Tavern (owned by CH).
- The existing easement ROW to be used for the installation of Feeder 76 is owned by Con Edison.
- Access roads to ROW discourage public entry.
- Any parties requesting access / visitation to Con Edison and O&R's substations and ROWs shall have escorted access with Con Edison or O&R employees, at a time acceptable to Con Edison and/or O&R.
- Con Edison will request access to CH's Rock Tavern substation as needed throughout the project.
- During construction, the project team will follow the Storm Water Pollution Prevention Plan ("SWPPP") document along with other permit requirements detailed in Section 8.10 including appropriate site control plans, *i.e.*, safety, security guards, additional gate/barriers, and other related items.

Operations Plan

Con Edison estimates that some incremental O&M will be required once the RRT line is in service. Preliminary annual cost estimates of O&M are included in Exhibit B. The following is a list of the expected O&M activities associated with Feeder 76 once the line is in service, most of which will be coordinated with the O&M for the existing Feeder 77 along the same ROW, and using existing towers:

- Semi-annual line patrol
- Bi-monthly aerial patrol
- Three year vegetation management cycle
- Ground testing every five years
- Climbing inspection every five years
- Tower painting every 15 years
- Stray voltage testing 20% per year
- Emergency patrols as needed
- ROW maintenance as needed
- Security

NYISO Interconnection Status

The RRT project was submitted to the NYISO interconnection process and has queue position 368. An SIS was completed and approved by the NYISO Operating Committee on August 16, 2012. No further action related to the NYISO interconnection process is required. A one-line of the proposed interconnection points is included in Exhibit A.

Environmental Justice Issues

Con Edison will conduct an analysis of potential environmental justice concerns for the Indian Point Contingency projects in accordance with NYSDEC Commissioner Policy CP-29, *Environmental Justice and Permitting*. The analysis will identify any Potential Environmental Justice Areas to be affected, describe the existing environmental burden on the Potential Environmental Justice Area and evaluate the potential burden of any significant adverse environmental impact on the area.

EPC Cancellation Provisions

Con Edison intends to include in any contract into which it enters in relation to the development and construction of the Project a right to terminate the contract at Con Edison's election for any reason. Upon such termination, the Company intends to require the contractor to stop performing all work and to cancel as quickly as possible all orders placed by it with subcontractors and suppliers, and to use reasonable efforts to manage cancellation charges and other costs and expenses associated with termination of work. The Company will also seek to enter into fixed price contracts, with payment contingent upon the achievement of certain milestones, to the greatest extent possible. While Con Edison intends to seek such terms, there can be no assurance that the Company will be successful in achieving them. In this regard, the Company notes that much of the equipment the Project requires will be highly customized; as a consequence, the Company does not expect to be able to cancel such orders (or that its contractor will be able to cancel such orders) once they are placed. The Company would expect that any proposer seeking to develop and construct transmission projects would be subject similar constraints.

8.10 Environmental Review

The environmental permitting plans for the Indian Point Contingency Projects were presented in earlier Con Edison PSC filings, and are incorporated herein by reference. Con Edison is now proceeding with procurement of environmental permitting vendors, pursuant to the PSC Order issued on April 19, 2013 directing Con Edison to begin development of these projects (Case No. 12-E-0503).

Permitting Plan:

Con Edison received an Article VII Certificate in 1972 that authorized the construction of the Ramapo to Rock Tavern transmission route with towers that could accommodate two 345kV circuits, although only one circuit was needed at that time. The Commission Order granting the Certificate allowed Con Edison to install the additional circuit with prior notice to the Commission. In 2010, Con Edison and O&R jointly petitioned the Commission to allow O&R to install proposed Feeder 28, a second circuit on the existing towers along the transmission route from Ramapo substation to Sugarloaf substation. The Commission allowed O&R to install proposed Feeder 28 under the original Article VII Certificate issued in 1972. However, given the passage of time since the Certificate was granted, the Commission requested that O&R submit an updated EM&CP presenting an assessment of potential environmental impacts associated with the installation of the proposed additional circuit. A Commission Order transferring a portion of the Article VII Certificate to O&R for installation of Feeder 28 from Ramapo to Sugarloaf, and approving the updated EM&CP, was issued on January 24, 2011 (Case 10-T-0283).

Based on the experience with Feeder 28, Con Edison expects that the only key permitting/approval requirements for the second Ramapo to Rock Tavern transmission line, also called Feeder 76, is Commission approval of updated EM&CP for the project and an amendment to the existing Article VII Certificate transferred to O&R for Feeder 28 to provide for the installation of a 345/138kV step-down transformer from Feeder 76 to Sugarloaf. It is envisioned that Con Edison and O&R would jointly file the EM&CP and the Article VII amendment as both approvals would be required for the Feeder 76 project. The EM&CP would address the Sugarloaf substation to Rock Tavern substation section of the existing ROW, including any incremental physical reinforcements needed to bring the existing transmission towers to current standards. The EM&CP would also address the incremental additional equipment required at the Ramapo and Rock Tavern substations, and would be equivalent in content and level of detail to the Feeder 28 EM&CP, which was approved by the Commission in January 2011. The Article VII amendment, similar to an EM&CP, would address the environmental impact of the proposed Sugarloaf 345kV substation.

The Feeder 76 EM&CP and Article VII amendment would together present an assessment of potential environmental impacts associated with the installation of the proposed additional circuit on the existing towers, and with the construction and operation of the proposed Sugarloaf 345kV substation and the incremental additional equipment at Ramapo and Rock Tavern substations. The EM&CP and Article VII amendment would identify the governing federal, state and local permitting and regulatory requirements, and evaluate the Feeder 76 project components against the substance of those requirements. This effort would

include evaluation of Feeder 76 predicted magnetic field levels against the Commission's interim 200 mG standard, and consultation with other state and local agencies on matters within their jurisdiction (*e.g.*, with NYSDEC regarding protection of State endangered/threatened species). A Request for Proposal has been issued by Con Edison to procure an environmental firm to perform the EM&CP study.

The following sets forth a preliminary list of major federal, state and local permits/approvals that are expected to be filed separately from the EM&CP and Article VII amendment:

1) Federal permits/approvals governing Feeder 76 project activities in any Federally-regulated wetlands and water bodies:

   The existence and extent of any Federally-regulated wetlands or water bodies would be identified during preparation of the Feeder 76 EM&CP. Feeder 76 installation activities affecting any Federally-regulated wetlands and water bodies would likely be permitted under the Clean Water Act Section 404 Nationwide Permit No. 12 ("NWP 12"), which was developed to cover land clearing and similar activities associated with installation of utility line crossings of wetlands and water bodies. NWP 12 provides authorization for such activities provided the cleared area is kept to the minimum necessary and preconstruction contours are maintained. The eligibility of Feeder 76 installation activities for NWP 12 would be confirmed during preparation of the EM&CP, and the required Pre-Construction Notification ("PCN") prepared and filed with the U.S. Army Corps of Engineers.

2) Federal requirements governing endangered/threatened species and archeological/cultural resources, which may require that protective measures be employed during installation of Feeder 76:

   During preparation of the EM&CP, the potential for Feeder 76 installation activities to affect such resources would be identified, any necessary Federal agency consultation would be performed, and any necessary protective measures would be developed.

3) State permits/approvals governing Feeder 76 project activities in any State-regulated wetlands and water bodies:

   The existence and extent of any State-regulated wetlands (defined differently than Federally-regulated wetlands) and State-regulated water bodies would be

identified during preparation of the Feeder 76 EM&CP. NY Transco would likely follow the process Con Edison and O&R recently undertook for installation activities affecting State-regulated wetlands and water bodies with respect to Feeder 28 (that is, O&R was given authorization by NYSDEC to conduct feeder installation activities in accordance with a NYSDEC General Permit issued to O&R under Environmental Conservation Law Article 15 – Protection of Waters and Article 24 – Freshwater Wetlands). The eligibility of Feeder 76 activities for coverage under Con Edison/ O&R's corresponding NYSDEC General Permit would be identified during preparation of the EM&CP, and the required notification package submitted to the NYSDEC.

4) Coverage under NYSDEC SPDES Construction Storm Water General Permit:

The Feeder 76 EM&CP preparation effort would include a State Pollutant Discharge Elimination System (SPDES) Construction Storm Water Pollution Prevention Plan (SWPPP) as a component of the EM&CP, and a Notice of Intent for filing by NY Transco with NYSDEC.

5) State and Local Transportation and Utility Crossing permits/approvals:

The Feeder 76 installation activities have the potential to impact roads, highways, railroads and other existing utilities. The EM&CP preparation process would identify each crossing affected and outline construction practices ensuring that vehicular, pedestrian or rail traffic is not adversely impacted. The appropriate state and local officials would be contacted and required permits for crossing and construction access would be obtained. For New York State highways this would require preparation and submission of NYSDOT Highway Work Permit applications, and Maintenance & Protection of Traffic Plans.

8.11 Pricing – Transmission Project

Project Cost Estimate

[Redacted]

Pricing Assumptions

[Redacted]

Transmission Rates

[Redacted]

Supporting Financial Exhibits

[Redacted]

8.13 Halting Costs

Due to the unique nature of transmission projects, Con Edison will need to purchase equipment that may not be usable for any other project. As such, the halting mechanisms reflect the fact that once equipment is ordered, Con Edison and NYPA must be able to recover 100% of the cost of such equipment, less any reductions available from cancellation provision in the procurement contract and realized salvage value. The halting mechanism also recognizes that in order to meet the In-Service Deadline, Con Edison has started the procurement process for a firm to perform the EM&CP, as well as preliminary engineering work for the project in April 2013 and will start equipment procurement activities as early as the third quarter of 2013. Thus, the halting mechanism must provide for the full recovery of costs incurred, as well as any contractual cancellation costs associated with such activities. It should also be noted that equipment procurement, engineering, and some construction activities will start even though not all of the required regulatory permits (environmental or community) will have been obtained as of this point in the project development schedule.

Recognizing the potential cost impacts to customers for the RRT Project, Con Edison can state the estimated costs that it will incur for the RRT Project at particular key points in time. Importantly, these estimates are based on conceptual project scopes and represent an order of magnitude reference for future project costs. As preliminary engineering and project tasks proceed, additional detail and certainty will support updated cost estimates. With respect to the RRT project, the estimated costs of halting the project at the key points in time are shown below:

Ramapo - Rock Tavern Line	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $123,100,000)	9/30/2013	**[Redacted]**
	3/31/2014	**[Redacted]**

	12/31/2014	**[Redacted]**
* The "Estimated Partial At Risk Cost" includes only an estimate of the committed dollars and do NOT include any cancellation charges that would be imposed by the contractors and equipment suppliers. The "Estimated Partial At Risk Costs" will be adjusted at the time of halting to include these costs. These costs are based on a 2016 in-service date estimate.		

8.13 Cancellation Clauses

See response to item 8.9.

8.14 Other Requirements

List of Required Easements and ROW Requirements

The project will utilize the existing ROW and transmission towers along the existing transmission route from the Ramapo to the Rock Tavern 345kV substations. At this time, no additional land rights are required to construct the substation upgrades at either the Ramapo or the Rock Tavern substations in order to connect the new 345kV line. Siting of the property for the Sugarloaf 345kV substation has not been completed, but it is anticipated this substation will utilize existing property owned by O&R in the vicinity. After the completion of the environmental studies, Con Edison will be able to better define if there is a need for any additional easements and properties.

Economic Development Benefits

Along with the other transmission projects proposed by the NY Transco in PSC Case No. 12-T-0502, this project is being proposed in order to accomplish the goals and objectives of the AC Order and the IP Order. In the AC Order, the Commission sought transmission projects that increase transfer capability through the Central East and UPNY/SENY interfaces.[10] In the IP Order, the Commission sought solutions that could address the need that would result if the IPEC were to retire. Both of these orders seek transmission solutions to meet the objectives of the Blueprint. As described in this submission as well as in the Plan and in the NY Transco

[10] AC Order, p. 2.

January 25, 2013 filing in Case 12-T-0502, this project will significantly reduce constraints over key transmission interfaces and provide the public policy benefits specified in the Blueprint.

Among the public policy goals that the RRT project will contribute to is an increase in economic development within New York State. Specifically, the RRT project is estimated to cost approximately $123 million in 2016 dollars. As a result of this investment, the New York State economy will reap significant economic development benefits in the form of increased employment and increases in local tax revenues.

Based on analyses performed by the Working Group for Investment in Reliable and Economic Electric Systems (the "WIRES" group) in conjunction with the Brattle Group, this $123 million of investment will support an estimated 500 direct full time equivalent ("FTE") jobs and nearly 1,600 total FTE jobs.[11] The directly supported jobs represent those related to domestic construction, engineering and transmission component manufacturing. Indirect job stimulation represents suppliers to the construction, engineering and equipment manufacturing sectors as well as jobs created in the service industries (*i.e.*, food and clothing) supporting those directly and indirectly employed. The RRT project is also estimated to increase annual local tax revenue by approximately $2.5 to $3.5 million.[12] The majority of this increased revenue will flow to the upstate regions of New York.

Statement with Respect to NYPA Appendixes and Bid Documents

It is intended that cost recovery for the RRT project will be accomplished through regulated transmission rates and not via a contract with NYPA. As such, the provisions set forth on the NYPA appendixes and the bid documents are inapplicable to the RRT project. That being said, the Company is providing the attached documents to demonstrate its commitment to equal opportunity and diversity and to aid the Commission in reaching its decision regarding which projects should be selected in this proceeding. This statement and the inclusion of these

---

[11] The direct and total job numbers are based on generic information included in the May 2011 report entitled *Employment and Economic Benefits of Transmission Infrastructure Investment in the U.S. and Canada*, which was developed by the WIRES group in conjunction with the Brattle Group. The report concluded that every $1.0 billion of transmission investment supports 4,250 direct FTE years of employment and 13,000 total FTE equivalent years of employment. This report can be found at the following link: http://www.wiresgroup.com/images/Brattle-WIRES_Jobs_Study_May2011.pdf.

[12] The estimated annual local tax revenue associated with these projects is based on a factor of approximately 2 -3% of project capital costs, which is consistent with the NY Transco estimate provided in Case 12-T-0502.

documents satisfy the requirements of the Commission's March 15th Order in Case 12-E-0503, which required that Con Edison provide information that is comparable and at the same level as that sought from official responders to the NYPA RFP.

Accordingly, Con Edison has attached the following documents to this response in Exhibit E:

1. Policy on Sexual Harassment
2. Policy on Equal Employment Opportunity
3. Employment of Individuals with Disabilities, Disabled Veterans, and Other Qualified Veterans

In addition the Company's annual 2012 diversity report can be found at the following link: 2012 Diversity Annual Report

8.15 Compliance Statement

It is anticipated that the Project will comply with applicable laws and regulations.

8.16 Project Benefit / "No Regrets" Analysis

In addition to the economic development benefits described above, the RRT project provides public policy benefits to New York State even if the IPEC does not retire. Summarized below is a "no regrets" analysis of the economic benefits this project produces in 2016 for all of the NYCA.

The RRT project substantially increases the transfer capability of the independent UPNY/ConEd interface by 1,425 MW (or by 26%) for the Normal transfer limits and 2,780 (or by 34%) increase in the Emergency transfer limit. In addition the RRT project also increases the transfer capability of the independent UPNY-SENY interface (by 120 MW under normal conditions and by 135 MW under emergency conditions) and of the independent Total East Interface (by 60 MW under normal conditions and by 65 MW under emergency conditions). **[Redacted]**

Additionally, when coupled with the Marcy South Series Compensation project, the transfer capability is further increased, providing even greater benefit to the State.

[Redacted]

New York Power Authority

And

New York State Electric & Gas Corporation

Submission of Comparable Information

Pursuant to the April 19, 2013 Public Service Commission Order

Case 12-E-0503

Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring Project

May 20, 2013

Table of Contents

Note: Section 8.11.2, Section 8.13, and all Exhibits have been redacted from this version of the submittal due to the confidential nature of the contents.

Executive Summary of Project (Section 8.2)

As part of a long-term transmission planning study performed by the New York Power Authority ("NYPA") in 2011, the Marcy South Series Compensation and Fraser to Coopers Corners Reconductoring ("MSSC") project was identified as a means to increase power transfer from upstate generators to downstate load in a cost effective manner. The project consists of installing switchable series compensation on the existing Marcy South transmission lines[1] and reconductoring a section of the 345 kV Fraser to Coopers Corners FCC-33 line. MSSC improves power flow over an existing asset by installing a relatively sophisticated technology, switchable series compensation. The switchable series compensation will be controlled by the New York Independent System Operator ("NYISO") and allow the NYISO to vary the power flows across the bulk power transmission system based on system conditions.

After the issuance of the Energy Highway Initiative by Governor Cuomo in his 2012 State of the State address, it became apparent to NYPA and New York State Electric & Gas ("NYSEG") that the MSSC is a project that can reduce the transmission bottleneck in central New York and optimize the use of an existing asset. The Final Report of the System Impact Study ("SIS") for the MSSC project (NYISO-Queue #380) shows a transfer limit increase of 444 MW across the Total East Transmission Interface due to the series compensation. The SIS has been completed, approved by the NYISO's TPAS committee, and is expected to receive final approval by the NYISO Operating Committee ("OC") on May 20, 2013. The series compensation increases power flow from Zone E into Zones F and G.

In addition to the technological advancement, MSSC has environmental and economic benefits. From an environmental perspective, the series capacitors will be installed on existing NYPA and NYSEG property, near existing substations, and will not require any additional Right-of-Way ("ROW"). During operation, the MSSC project will not directly generate any air or water pollution. From the economic viewpoint, the increased power flow of 444 MW at an estimated cost of $76 million equates to a cost of less than $200,000 per MW.

The MSSC project improves the power flow from upstate generation to downstate load in a cost effective manner by increasing the utilization of existing AC transmission assets. The in-service date for the MSSC project is June 1, 2016.

It is respectfully submitted that the MSSC project accomplishes all of the goals of this proceeding. The MSSC project can be in service by June 1, 2016, provides significant benefits at a reasonable cost, addresses reliability needs should Indian Point Energy Center ("IPEC") retire, and facilitates increased capability to more efficiently deliver upstate generation to downstate load.

Description of Project (Section 8.3)

The MSSC project is a transmission improvement project that adds switchable series compensation to increase power transfer by reducing series impedance over the existing 345 kV Marcy South lines. Specifically, the project adds 40% compensation to the Marcy-Coopers Corners 345 kV line, 25% compensation to the Edic-Fraser 345 kV line, and 25% compensation to the Fraser-Coopers Corners 345

[1] Marcy South transmission lines are Marcy to Coopers Corners (UCC2-41), Edic to Fraser (EF24-40), and Fraser to Coopers Corners (FCC-33).

KV line through the installation of series capacitors. The project also involves upgrades at Marcy and Fraser 345 KV substations. The project reconductors approximately 21.8 miles of the NYSEG-owned Fraser-Coopers Corners 345 kV line (FCC-33) with a higher thermal-rated conductor installed on existing wooden pole and steel tower structures. The project increases thermal transfer limits across the Total East Interface and the UPNY/SENY Interface and provides a partial solution for system reliability should IPEC retire.

The MSSC project transmission corridor begins at the Marcy substation near Utica, New York and ends at the Coopers Corners substation near Monticello, New York. Both substations are located in Zone E, but the MSSC produces increased power flow into Zones F and G. The MSSC project has minimal environmental and community impacts as the construction will occur in existing ROW, outside of any New York State Department of Environmental Conservation ("NYSDEC")-regulated wetlands, and on NYPA and NYSEG easements.

The Final Report of the SIS of the MSSC project (Queue #380) has been completed, approved by the NYISO's TPAS committee, and is expected to receive final approval by the NYISO OC on May 20, 2013.

The Exhibits to this submission contain the following:

1- A map of the location of the MSSC (Exhibit A).
2- Maps of the Marcy and Fraser substations (Exhibits B and C), respectively.
3- A picture of a sample series capacitor installation (Exhibit D).
4- A picture of a typical FCC-33 wood pole structure (Exhibit E).
5- List of NYPA & NYSEG's generating facilities and transmission lines (Exhibit F).
6- NYPA RFP, Attachment 3 (Exhibit G).
7- NYPA RFP, Attachment 5 (Exhibit H).
8- NYPA RFP, Attachment 7 (Exhibit I).

Proposer Experience **(Section 8.4)**

Created in 1931, NYPA is a public authority and political subdivision of the State which owns and operates 16 generating facilities and about 1400 circuit miles of high voltage transmission lines. A list of NYPA's generating plants and transmission lines is included in Exhibit F. The electricity NYPA generates and purchases is sold to municipally owned utilities and electric cooperatives, as well as to a variety of business, industrial and public customers throughout the State. NYPA is a fiscally independent public corporation that does not receive State funds, tax revenues, or credits.

NYPA has a long and proud history of constructing energy infrastructure in New York State, beginning with the construction of the St. Lawrence-FDR Project and the Niagara Power Project, completed in 1958 and 1961, respectively. These projects, in conjunction with NYPA's Blenheim-Gilboa Project (completed in 1973), provide over 4500 MW of clean hydropower for New York State customers. In the 1970's, NYPA constructed: 1) 230 kV transmission line from the St. Lawrence-FDR Project to Plattsburgh, 2) 345 kV transmission line from Blenheim-Gilboa Project to Leeds and 3) 765 kV line from Massena to Marcy. In the 1980's, NYPA built the Marcy South lines and the Sound Cable Project.

NYPA's most recent experience involving the development, financing, and construction of electric generating plants and/or transmission facilities includes the 500MW Combined Cycle Power Project located in Astoria, New York which became commercially operational in December 2005, and the current construction of the HTP transmission project with a projected in-service date of May 2013. NYPA in conjunction with National Grid financed, licensed and constructed the Tri-Lakes Reliability Project, which was a 69 kV transmission project in the Adirondack Park that went into service in 2009.

NYSEG is a regulated public utility organized under the laws of the State of New York. NYSEG is engaged in the transmission and distribution of electric power and natural gas. NYSEG provides electric service to 878,000 customers in 42 counties in New York State. NYSEG owns 4,583 miles of electric transmission lines, 32,881 miles of electric distribution lines and 444 substations. A list of NYSEG's generating plants and transmission facilities are contained in Exhibit F. NYSEG is a wholly-owned subsidiary of Iberdrola USA, Inc., which in turn is a subsidiary of Iberdrola, S.A. (an international energy company listed on the Madrid Stock Exchange).

NYSEG's most recent experience with the development, finance and construction of transmission includes:

Ithaca Transmission Project-consisting of a new 345 kV/115 kV Clarks Corners Road Substation, rebuilding of the 115 kV transmission line #945 from Etna to Lapeer, and construction of a new 15 mile, 115 kV line #715 from Etna to the new substation.

Corning Valley Project-consisting of a new 230kV/115kV Stoney Ridge Substation, and construction of a 9.6 mile 115 kV transmission line from West Erie Avenue Substation to the Stoney Ridge Substation.

In addition to this major construction work, NYSEG plans to conduct over $41,000,000 of capital work on its extensive transmission system in 2013.

NYPA and NYSEG were both member companies of the New York Power Pool, the predecessor to the NYISO. As such, both companies played a fundamental role in the development and establishment of the NYISO, its markets and associated FERC jurisdictional tariffs. As members of the NYISO, NYPA and NYSEG actively participate in its governance, and are owners of extensive transmission facilities under the operational control of the NYISO.

NYPA and NYSEG have extensive experience obtaining regulatory approvals for the construction and operation of transmission and generating facilities. Major approvals which have been obtained in the past include, but are not limited to, Certificates of Environmental Compatibility and Public Need (Article VII Certificates), Article X Permits, Army Corps of Engineers (ACOE) permits, and 401 Water Quality Certificates.

NYPA and NYSEG have extensive personnel resources to contribute to this project. The primary Project Management team will consist of the following individuals:

NYPA TEAM:

Project Sponsor:	John Suloway	Vice President, Project Development & Licensing
Project Leader:	Mark Malone	Director, Project Development & Licensing

Principal Engineer:	Ben Shperling	Principal Electrical Engineer
Project Management:	Ricardo DaSilva	Electrical Engineer II
EH&S:	Jeff Gerlach	Manager, Environmental Studies & Remediation
Finance:	Tom Davis	VP, Financial Planning & Budgets
Compliance:	Wayne Sipperly	NERC Reliability Compliance Program Manager
Accounting:	Austin Davis	Manager, Plant & Cost Accounting
Law:	Andrew Neuman	Special Counsel
Law:	Glenn D. Haake	Principal Attorney II
Real Estate:	John Wingfield	Geographic Information System Manager

NYSEG Team:

Project Sponsor:	Javier Bonilla	Vice President, Engineering & Capital Delivery
Project Leader:	Ellen Miller	Director, Electric Capital Delivery
Principle Engineer:	Brian Conroy	Director, Electric System Engineering
Project Management:	Joseph Simone	Manager, Electric Capital Delivery
Environmental & Licensing:	Carol Howland	Lead Analyst, EH&S Compliance
Law:	Noelle Kinsch	Deputy General Counsel
Real Estate:	Deborah Drake	Supervisor, Property Management

To supplement in-house resources, NYPA and NYSEG have the contractual arrangements and the financial resources to obtain outside expertise that will contribute to the MSSC project in a professional and responsive manner. NYPA and NYSEG are committed to completing this project by the June 1, 2016 operational date. It is anticipated that the MSSC will be ultimately transferred to the NY Transco[2].

Project Information **(Section 8.5)**

Created in 1931, NYPA is a public authority and political subdivision of the State. NYPA's Dun & Bradstreet number is 07-525-2098

New York Power Authority
123 Main Street
White Plains, New York 10601
Contact Person: Mark Malone
Contact phone: (914) 390-8026
Contact email: mark.malone@nypa.gov

[2] The NY Transco is a New York limited liability company proposed to be formed in or about July 2013 and co-owned by the following entities or their newly formed special purpose affiliates: Consolidated Edison/O & R; Niagara Mohawk Power Corporation, a New York corporation d/b/a National Grid; NYSEG, a New York Corporation, and Rochester Gas & Electric Corporation, a New York Corporation; NYPA, a corporate municipal instrumentality and political subdivision of the State of New York; and the Long Island Power Authority.

Created in 1852, NYSEG is an electric and gas corporation regulated by the New York State Public Service Commission. NYSEG's Dun & Bradstreet number for its Link Drive office is 04-186-6497.

NYSEG
18 Link Drive
Binghamton, New York 13902
Contact Person: Ellen Miller
Contact Phone: (207) 621-3936
Contact email: ellen.miller@cmpco.com

Disclosure Statements (Section 8.6)

Upon information and belief, NYPA has no disclosures to make pursuant to the requirements of Section 8.6. Iberdrola USA and its subsidiaries, including NYSEG, are defendants in numerous civil litigation matters in the ordinary course of business. In some of these matters, the allegation or cause of action may be for conversion or fraud. However, none of these litigation matters where the allegation is for fraud or conversion are material.

Financial Capacity to Complete and Operate the Proposed Project (Section 8.7)

Financing Plan

NYPA will secure its own portion of financing requirements through its access to the capital markets with a portion of the MSSC project costs expected to be financed through equity (see further discussions below).

NYPA is a New York State Authority and does not have a parent. NYPA has favorable debt / total capitalization (34%) and debt / equity (51%) ratios; days cash on hand (200+); unrestricted cash and investments ($1.4 billion); and credit ratings of AA-/Aa2/AA (S&P, Moody's, Fitch). As such, NYPA has readily available access to the capital markets as well as sufficient equity to finance the MSSC project. It is anticipated that the MSSC project will be transferred to the NY Transco and subsequently developed and financed by the NY Transco.

For the MSSC project, NYPA proposes a capital structure of fifty percent debt, fifty percent equity. The debt would be structured to match the expected useful life of the MSSC project. As noted above, because of NYPA's strong credit rating, it is able to obtain very favorable financing rates.

NYPA currently owns and operates in New York five major generating facilities, four small hydroelectric facilities, and eleven small electric generating units, with a total installed capacity of approximately 6,051 megawatts ("MW"), and a number of transmission lines, including major 765-kV and 345-kV transmission facilities.

Aside from financing Life Extension and Modernization programs at two of its large hydroelectric facilities, NYPA financed and constructed a 500 MW combined cycle generating plant in Astoria, New York which went into commercial operation December 31, 2005. NYPA initially used short-term

financing to fund preliminary engineering and start-up construction costs. The short-term financing was subsequently refunded with fixed rate financing which was also utilized to finance the majority of the remaining costs to construct the plant. A balance of costs remaining to complete the plant once the proceeds of the fixed rate financing were depleted was funded with the issuance of commercial paper notes.

NYPA has, on two occasions, refunded portions of the fixed rate bonds by issuing refunding bonds with lower overall yields. NYPA has also retired, on an accelerated basis, a portion of the commercial paper notes issued at the back-end of the project. While the 500 MW plant was funded 100% with debt, NYPA believes, from a business stand-point, financing future projects with a combination of debt and equity is more appropriate (please see discussion above).

1. Audited financial statements for its most recent fiscal years; or

Available at www.nypa.gov

2. Audited financial statements from Proposer's parent, if proposer does not have such financial statements; or

Not applicable

3. Explanation if the statements above cannot be provided and alternate information to demonstrate Proposer's financial capacity to complete and operate the proposed Project

Not applicable

NYPA self-finances its transmission and generation projects by issuing Revenue Bonds and Notes of NYPA, as well as using equity. With the exception of banks providing liquidity facilities (which have never been drawn down on) no third party financing is utilized.

See NYPA RFP Attachment 5 (Exhibit H)

NYSEG: NYSEG is a gas and electric corporation organized under the laws of the State of New York in 1852. NYSEG is an indirect, wholly-owned subsidiary of Iberdrola USA and serves approximately 880,000 electric and 195,000 natural gas customers in New York State.

Financing Plan – The MSSC project would represent a relatively insignificant increase (<5%) in NYSEG's overall capital budget during the construction phase. NYSEG would finance the MSSC project along with all of its other capital and operating needs with a mix of debt and equity consistent with its financing strategy. NYSEG's financing strategy is to maintain a capital structure that is consistent with the capital structure assumed in the establishment of rates. Currently that target is a 48% equity ratio and NYSEG's actual equity ratio was 50% at March 31, 2013. NYSEG limits the payout of dividends to maintain it target equity ratio and also has the support of its parent Iberdrola S.A., should additional equity capital be required. NYSEG has credit ratings of BBB+ / Baa1 / A- from S&P, Moody's and Fitch, respectively and has access to the debt capital markets for long-term debt funding. NYSEG also has short-term financing available through a $200 million commercial paper program and additional credit of up to $250 million available to it through Iberdrola USA.

1. Audited financial statements for its most recent fiscal years; or

See www.nyseg.com

2. Audited financial statements from Proposer's parent, if proposer does not have such financial statements; or

Not applicable

3. Explanation if the statements above cannot be provided and alternate information to demonstrate Proposer's financial capacity to complete and operate the proposed Project

Not applicable

Environmental Benefits of the Project (Section 8.8)

The MSSC project has tremendous environmental benefits. It does not contribute to water pollution or generate any hazardous waste. The project increases the power flow across the existing transmission system. Because the MSSC project transmits power from existing, in-state resources, it can be considered an environmental pollution avoidance project. Instead of having to construct a new power plant which would generate pollution, the MSSC project transmits existing electricity more efficiently.

The MSSC project increases our capability to bring more power, including that from clean renewable sources, from upstate New York. This project does not require the acquisition of additional real estate for the series capacitors, and the transmission line reconductoring utilizes existing ROW.

There are no direct additional air emissions created as a result of this project, as opposed to those from new generation units. The MSSC project will have the necessary environmental permits in hand for the project to ensure construction is performed in an environmentally acceptable manner.

As identified in the New York Energy Highway Blueprint, this project is a significant component of the transmission upgrades in Northern New York that help facilitate renewable energy development.

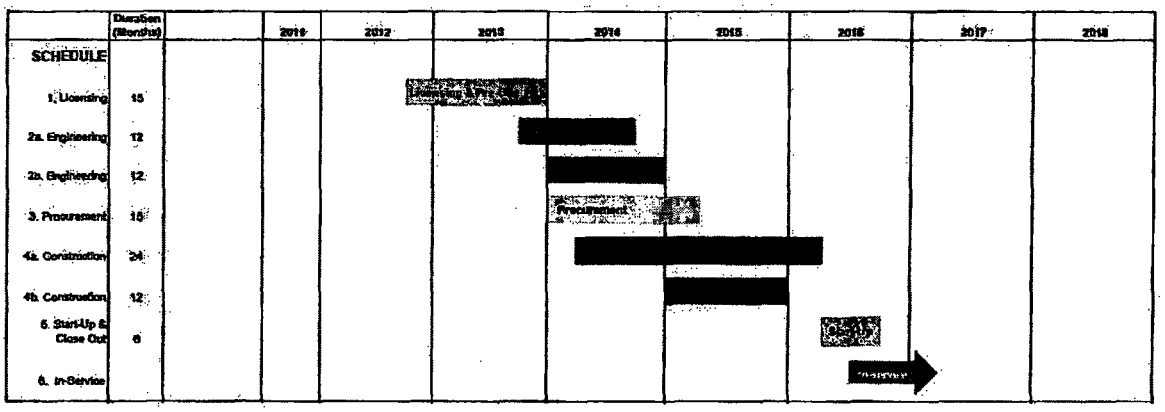
Proposed Resources Development Plan and Schedule (Section 8.9)

In July 2012, NYPA contracted with an engineering firm to perform preliminary engineering services for the MSSC project. These services included identifying the size and locations for the series capacitor installations, identifying a proposed conductor type for the FCC-33 line, contacting equipment manufacturers for preliminary cost and schedule information, and determining a proposed construction and outage schedule to ensure commercial operation by June 1, 2016. The preliminary schedule of the MSSC project is shown below:

NEW YORK POWER AUTHORITY
SERIES COMPENSATION PROJECT
SCHEDULE

New York Power Authority

SERIES COMPENSATION PROJECT SCHEDULE



Series Capacitor Installations

The series capacitor banks must be installed along the three Marcy South lines: UCC2-41, EF24-40, and FCC-33. The criteria for locating the series capacitor banks includes operational performance, minimal community and environmental impacts, and effective operations and maintenance over the long term. Locations near the existing Marcy, Edic, Fraser, and Coopers Corners substations were evaluated. This evaluation included review of electrical drawings, existing substation equipment, site visits, and constructability. The primary locations were identified as 1 series capacitor installation, 900 MVAR, at the Marcy substation, and 2 series capacitor installations, 300 MVAR and 230 MVAR, at the Fraser Substation. These primary locations are on existing NYPA and NYSEG easements, under NYPA and NYSEG site control, outside of existing wetlands, and enable operations and maintenance of the installations to be performed by NYPA and NSYEG personnel going forward.

Reconductoring of the 21.8 mile FCC-33 line

The preliminary engineering services for the reconductoring of the FCC-33 line involved identifying a new conductor that is strong, lightweight, and has a higher thermal rating than the existing, single bundle 2156 ACSR. The required thermal ratings for the new conductor are based on the SIS that was performed by NYPA as part of the NYISO Interconnection process.

The preliminary engineering studies identified two High-temperature, Low-sag conductors that will meet the new thermal rating requirements: 3M ACCR 1962-T11 and CTC ACCC Chukar II. These conductors were modeled using PLS-CADD based on the NESC C2-2012 loading conditions.

The existing structures were then modeled with the new conductors to identify structures that may require modifications. Each of the two proposed conductors would require different structural modifications, and

the final modifications will be determined based on the actual conductor chosen for installation during final design.

Detailed Design

As mentioned above, the preliminary engineering for the MSSC project has been completed with the identification of the preferred locations for the capacitor banks and the identification of two potential conductor types. The detailed engineering and design is currently underway. This will finalize the capacitor bank footprint size and location, the conductor type, and the required structure modifications, if any.

The SIS was completed and approved by TPAS on May 6. It is expected to receive final approval by the NYISO Operating Committee ("OC") on May 20, 2013. Approval by the OC completes the NYISO Interconnection process. In addition to the NYISO SIS, a subsynchronous resonance study is currently underway to ensure nearby generators will not experience any damage from the series capacitors.

Proposed Date(s) for any PSC or FERC Orders

The current schedule for the MSSC project which enables an in-service date of June 1, 2016 is based on three events: 1) the PSC selection of the MSSC in Case 12-E-0503 during September 2013, 2) the issuance of the Amendment to the existing Article VII Certificate for the Marcy South during first quarter 2014, and 3) the issuance of all applicable permits for the FCC-33 line reconductoring during second quarter 2014.

As the MSSC project is expected to be transferred to the NY Transco, the following dates are also anticipated:

- PSC Approval of Section 70 asset transfer filing during the first quarter of 2014
- FERC approval of NY Transco formula rate during the middle of 2014
- FERC approval of NY Transco incentives during the middle of 2014
- FERC approval of cost allocation during the middle of 2014

Timeline for Award of EPC Contract and Equipment Fabrication

The MSSC project will involve an EPC contract for the series capacitors. The bid package is anticipated to be completed and issued during the Fall of 2013. Proposers will have eight weeks to respond to the EPC bid. Anticipated bidders include General Electric, ABB, and Siemens. All three companies have experience with series capacitor design and installation, and will warranty the equipment and installation. The capacitors are anticipated to be designed and installed within 18 months of contract award.

The reconductoring of the FCC-33 line will be performed as a design, bid, build. NYSEG is currently designing the new conductor and structure modifications and will be procuring the new conductor. It is anticipated that there is a 6 month lead time on the conductor. NYSEG will be procuring installation services and will be coordinating outages with the NYISO. The final design is anticipated to be completed by December 31, 2013.

Permitting and Licensing

In parallel with the detailed design effort, the appropriate permits and licenses will be obtained for the MSSC project. At a meeting with the Department of Public Service on May 3, 2013, NYPA and NYSEG obtained input from staff as to the licensing and permitting requirements for the MSSC project. These efforts are currently underway. A joint meeting with the NYSDEC and other potentially interested agencies is scheduled for May 21, 2013 to determine permitting requirements specific to these agencies.

Community Outreach Plan

NYPA and NYSEG will design an appropriate Community Outreach Plan for the MSSC project. It will include the following stages:

Stage 1: Project Announcement – Framing the Issues
During the first stage of the public outreach program, NYPA and NYSEG will:

- Refine the overall public outreach plan, including the objectives and key messages
- Confirm key audiences or stakeholder groups identified previously
- Establish timeframes for the outreach program, including a long range and more detailed short range schedule
- Assign responsibilities
- Begin the preparation of collateral materials, including a press release to announce the project
- Implement a pre-announcement contact program
- Announce the project

Stage 2: Route Selection – Reaching Out and Establishing a Dialogue
The MSSC project route is established and NYPA and NYSEG will be reaching out to stakeholders to establish a two-way dialogue. The information to be shared at this stage will consist primarily of the following:

- A clear articulation of the need for the project
- A description of the route and impact at the existing substation sites
- Transmission line design characteristics, estimating structure modifications
- Information on issues that may be easily anticipated, such as EMF

An effective public outreach program involves two-way communication. Thus, the purpose of the outreach is to initiate a dialogue, so NYPA and NYSEG can better understand the community's perceptions, concerns and issues, and address them through the design of the project, in the information that is shared, and in other creative ways that demonstrate responsiveness.

Activities proposed in this stage of the program will include:

- Development of a mailing list
- Conduct open house meetings

- Communication with the media
- Website development and maintenance
- Establish project telephone line and e-mail address
- Prepare collateral materials (i.e., fact sheets, newsletters, brochures)

Stage 3: Application Review – Managing Issues

Once NYPA's Article VII Amendment application is filed relative to the series capacitors and NYSEG's State Agency permit applications are filed relative to NYSEG's reconductoring, the public outreach program will focus on keeping stakeholders informed of the process and announcing the achievement of major milestones. In addition, the public outreach team will be available to support NYPA and NYSEG in issue management, which includes being aware of issues as they arise in the application review process, understanding the implications of them from a public relations standpoint, and devising an appropriate communications strategy. It is in this stage that having a team structure, close coordination, and good internal communication really pays off. For, although this stage of the process may proceed very smoothly with few issues surfacing at the community level, being able to anticipate significant community issues and respond quickly is important. The Public Affairs team will establish protocols for prompt and coordinated response to public inquiries and issues raised by opposition groups.

Activities during this stage will include:

- Convening small-scale meetings and individual briefings with key stakeholders about specific issues
- Issuing press releases as major milestones are achieved
- Updating the web page including timely responses to manage content and respond to inquiries, comments, and issues
- Mailing project updates or newsletters to stakeholders on the mailing list
- Maintaining awareness of opposition group positions through internet monitoring

The benefits of active use of the internet cannot be over-emphasized. A project-specific website or project link from NYPA's and NYSEG's website is expected to be available for dissemination of public information and permit application documents. This site will also provide a mechanism for public comments and requests for additional information, and will require regular monitoring to ensure responsiveness All internet postings by NYPA and NYSEG will be transparent, factually correct, and updated as often as necessary.

Stage 4: Design and Construction – Consolidating Community Support and Following Through

During construction, NYPA and NYSEG will keep the neighbors and customers informed of progress. To the extent that the team has been successful in communicating the benefits of the project, the community will be informed of how the project is going. Progress reporting will be accomplished through the media and/or periodic mailings (letters, newsletters, bill stuffers). There will also be a procedure in place for responding promptly and effectively to questions and complaints. Through the efforts invested up to this

point, the framework will be established to enable NYPA and NYSEG to continue the public outreach efforts and ensure good community relations.

Equity and Debt Financing Plans

Please see Section 8.7.

Community Benefits

Please see Section 8.14

Taxes and/or Pilot Agreements

NYPA does not pay real estate taxes. NYSEG's portion of the project would be subject to real estate taxes,

Site Control Status

The series capacitors are being installed adjacent to the existing Marcy and Fraser substations. These will be under NYPA and NYSEG control, respectively. The FCC-33 line is existing and under the control of NYSEG.

Operations Plan

While the application of a series capacitor is new to the electric system at NYPA and NYSEG, the system is comprised of conventional power system devices currently installed at existing facilities operated and maintained by the utilities. The preventive maintenance practices for the system can be developed by reviewing the manufacturer's recommended procedures, in addition to, industry, NERC/NPCC, NYPA and NYSEG standard policies and procedures. A thorough review of the manufacturer's recommended procedures and maintenance intervals will be conducted to develop an optimal maintenance program and spare parts inventory.

As with any preventive maintenance program, it is recognized that historical operations and maintenance data provide valuable insight into the effectiveness of the preventive maintenance practices. As operations and maintenance experience is gained on the particular components, it is expected that the historical testing and trend data will enable the preventive maintenance program to be fine-tuned, with testing intervals for various components being increased or decreased, as required.

Maintenance outages will be scheduled based on the manufacturer's recommended practices, in addition to, industry, NERC/NPCC, NYPA and NYSEG standard policies and procedures. When safe and practical, maintenance will be performed on equipment while the series capacitor remains in service.

The utilities employ a staff of trained and qualified engineers and maintenance personnel familiar with operations and maintenance of power systems equipment. The proximity of the capacitor banks to the Marcy and Fraser substations allows for NYPA and NYSEG personnel to perform the inspections and maintenance in a cost effective manner. Additional training on manufacturer's specific equipment and procedures will be arranged, as necessary.

The existing ROW maintenance and line inspection practices for the FCC-33 line will continue with the use of NYSEG personnel. These practices are in accordance with NERC/NPCC, NYSEG and industry standard policies and procedures. The reconductoring of a portion of the line should not impact the current operation and maintenance practices.

Electric Interconnection Points

The MSSC project transmission corridor begins at the Marcy substation near Utica, New York and ends at the Coopers Corners substation near Monticello, New York. Both substations are located in Zone E, but the MSSC produces increased power flow into Zones F and G.

Status in NYISO Interconnection Process

The Final Report of the SIS for the MSSC project (NYISO- Queue #380) shows a transfer limit increase of 444 MW across the Total East Transmission Interface due to the series compensation. The Final Report of the SIS for the MSSC project was completed, approved by the NYISO's TPAS committee, and is expected to receive final approval by the NYISO OC on May 20, 2013. The OC's approval of the SIS completes the NYISO Interconnection Process. The series compensation increases power flow from Zone E into Zones F and G.

Environmental Justice

NYPA and NYSEG compared the location for the series capacitors and the 21.8 mile section of the FCC-33 line to the NYSDEC's data file of the Potential Environmental Justice Areas (PEJAs). This data file is comprised of sites that have met one or more of the NYS DEC criteria in the 2000 U.S. Census. According to this dataset, the closest PEJA to the Marcy substation is approximately 3 miles away. The closes PEJA to the Fraser Substation is approximately 13 miles away.

Cancellation Provisions

NYPA and NYSEG intend to include in any contract into which they enter in relation to the development and construction of the MSSC a right to terminate the contract at NYPA and NYSEG's election for any reason. Upon such termination, NYPA and NYSEG intend to require the contractor to stop performing all work and to cancel as quickly as possible all orders placed by it with subcontractors and suppliers, and to use all reasonable efforts to minimize cancellation charges and other costs and expenses associated with termination of work. NYPA and NYSEG will also seek to enter into fixed price contracts, with payment contingent upon the achievement of certain milestones, to the greatest extent possible. While NYPA and NYSEG intend to seek such terms, there can be no assurance that NYPA and NYSEG will be successful in achieving them. In this regard, NYPA and NYSEG note that much of the equipment the MSSC requires will be highly customized; as a consequence, NYPA and NYSEG do not expect to be able to cancel such orders (or that its contractor will be able to cancel such orders) once they are placed. NYPA and NYSEG would expect that any proposer seeking to develop and construct transmission projects would be subject to similar constraints.

Environmental Review (Section 8.10)

The installation of the series capacitors will require an Amendment to the existing Article VII Certificate for the Marcy South, Case 70126. The reconductoring of the FCC-33 line will require the completion of various studies and investigations as well as procurement of certain permits and approvals which will be coordinated with the NYSDEC.

The following Federal, State and local environmental laws and regulations have been assessed for applicability to this project. Initial coordination with these agencies has commenced and required permits and/or approvals will be acquired as outlined in the proposed schedule.

Federal Agency	**Regulations (Permit)**	**Applicability/Status**
U.S. Army Corps of Engineers (USACE) New York District	Clean Water Act - Section 404 Permit Nationwide Permit No. 12 *33 USC 1344*	A permit with the USACE is not expected. A Preconstruction notification will be required if certain thresholds are exceeded.
U.S. Fish & Wildlife Service	Federal Endangered Species Act *16 USC 1531* Migratory Bird Treaty Act *16 USC 703* Bald and Golden Eagle Protection Act *16 USC 668*	Process initiated. NY Natural Heritage program data request used to identify potential species concerns.
State Agency	**Applicability**	
New York State Department of Public Service, Public Service Commission (PSC)	Public Service Law - Article VII U.S. Clean Water Act - Section 401 Water Quality Certification *16 USC 1451*	Initial coordination with DPS staff to determine applicability of Public Service Law Existing structure heights not expected to increase.

New York State Department of Environmental Conservation (NYSDEC)	State Pollutant Discharge Elimination System (SPDES) Construction Stormwater Permit *6 NYCRR §750-1.21* Threatened and Endangered Species *6 NYCRR Part 182* Freshwater Wetlands Permit *6 NYCRR, Part 608; ECL Article 24* Protection of Waters Permit *6 NYCRR, Parts 663-665 Article 15* Catskill Park Preserve	Construction activities disturbing more than 1 acre will require a SPDES permit and SWPPP NY Natural Heritage program data request Initial assessment of SC bank location impacts, access road crossings and pulling stations to determine applicability of these permits. Existing easement
State Historic Preservation Office (SHPO)	Section 106 Consultation under the National Historic Preservation Act (NHPA) – if federal permits/approval required Section 14.09 of the New York State Historic Preservation Act *16 USC 470*	Visual assessment may be performed only if structure heights increase significantly. Phase 1 archeological assessment to be performed for those areas not previously disturbed.
Local		
Town of Marcy Oneida County	Local Ordinances	
Town of Delhi Delaware County	Local Ordinances	
Town of Hamden Delaware County	Local Ordinances	
Town of Colchester Delaware County	Local Ordinances	
Town of Rockland Sullivan County	Local Ordinances	
Town of Thompson Sullivan County	Local Ordinances	
NYC Department of Environmental Protection	Approval of construction activities on NYC water supply lands	SWPPP used to eliminate potential stormwater runoff concerns in the Pepacton Reservoir

In addition to the permits identified above, an electromagnetic field (EMF) calculation will be performed in accordance with the DPS guidance. Geotechnical studies are also required at the locations of the series capacitors.

A MSSC website will be established and contain a repository of all relevant permits, environmental studies, and agency correspondence.

Pricing for Transmission Projects **(Section 8.11.2)**

CONFIDENTIAL AND REDACTED

Halting Costs **(Section 8.13)**

CONFIDENTIAL AND REDACTED

Other Requirements **(Section 8.14)**

The MSSC project will be constructed on existing ROWs and existing easements. No new ROW is required. Based on the capital cost of $76 million, 150 man years will be required to complete the project.

Compliance Statement **(Section 8.15)**

All products or services provided by NYPA and NYSEG for the MSSC project will be in compliance with all applicable legal and regulatory requirements.

Exhibit A

Location of Marcy South Lines

CONFIDENTIAL AND REDACTED

Exhibit B

Proposed Series Compensation Installation at Marcy

CONFIDENTIAL AND REDACTED

Exhibit C

Proposed Series Compensation Installation at Fraser

CONFIDENTIAL AND REDACTED

Exhibit D

Example of a series capacitor installation

CONFIDENTIAL AND REDACTED

Exhibit E

Example of H-frame wood pole structure

CONFIDENTIAL AND REDACTED

Exhibit F

NYPA owned Generating and Transmission Facilities

CONFIDENTIAL AND REDACTED

Exhibit G

NYPA RFP, Attachment 3

CONFIDENTIAL AND REDACTED

Exhibit H

NYPA RFP Attachment 5

CONFIDENTIAL AND REDACTED

Exhibit I

NYPA RFP Attachment 7

CONFIDENTIAL AND REDACTED

Neil H. Butterklee
Assistant General Counsel

May 20, 2013

VIA E-MAIL
Honorable Jeffrey C. Cohen
Acting Secretary
State of New York
Public Service Commission
Three Empire State Plaza
Albany, New York 12223-1350

Re: Case 12-E-0503 – Con Edison Filing of Supplemental Information Regarding its Staten Island Unbottling Project

Dear Acting Secretary Cohen:

On February 1, 2013, in response to a November 30, 2012 order from the Public Service Commission ("Commission") in this proceeding, Consolidated Edison Company of New York, Inc. ("Con Edison" or the "Company") and the New York Power Authority ("NYPA") filed their Indian Point Contingency Plan ("Plan") which included a proposal to build three Transmission Owner Transmission Solutions ("TOTS") as well as a plan for NYPA to issue a request for proposals ("RFP") for third party transmission and generation solutions. The Plan contained significant details regarding the three TOTS. In the Commission's March 15, 2013 Order in this proceeding (the "March 15th Order"), the Commission required Con Edison and NYPA to supplement the description of their TOTS with additional information so that the level of information submitted by Con Edison and NYPA to the Commission was comparable to the level of information requested from third party respondents to the NYPA RPF. Accordingly, Con Edison hereby files its supplemental information with respect to the Staten Island Unbottling ("SIU") project.

As indicated in the Plan and in the accompanying materials, the SIU project is a new resource that interconnects within New York Independent System Operator ("NYISO") load zone J and can be in service by June 2016. The SIU project meets the requirements necessary to be a solution for the retirement of the Indian Point Energy Center ("IPEC"). In addition, this

Consolidated Edison Company of New York, Inc.
4 Irving Place – Room 1875-S New York NY 10003 212 460 1089 212 677 5850 fax butterkleen@coned.com

project provides additional benefits beyond transmitting replacement energy in the event that the IPEC retires.

Consistent with the requirements of the March 15th Order (p.18), the project costs described in this filing represent a good faith preliminary engineering estimate for the project. That being said, it is possible that the project's costs may change as project details are further defined.

Please feel free to contact me if you have any additional questions.

Very truly yours,

/s/ Neil H. Butterklee

Consolidated Edison Company of New York, Inc.

Additional Information on Transmission Owner Transmission Solution for Indian Point Contingency Plan:

Staten Island Unbottling Project

May 20, 2013

Contents

Exhibits

Exhibit A: One-line Diagrams of the SIU project

Exhibit B: Attachment 5 of NYPA RFP – Financial Data Sheet

Exhibit C: Attachment 7 of NYPA RFP – Pricing Data Sheet

Exhibit D: Attachment 3 of NYPA RFP – Transmission Project Data Sheet

Exhibit E: Con Edison policy statements

8.2 Executive Summary

As shown herein, the New York State Public Service Commission ("Commission") should select Consolidated Edison Company of New York, Inc.'s ("Con Edison" or the "Company") Staten Island Unbottling ("SIU") project as one of the solutions in this proceeding for the following reasons:

1. The project can be delivered by the June 2016 deadline and has a clear head start because it does not need an Article VII certificate and it involves incremental investments to existing transmission assets;
2. The project addresses the reliability needs that would exist if the Indian Point Energy Center ("IPEC") were to retire and provides benefits throughout the State even if the IPEC does not retire.
3. Its estimated costs are reasonable; and
4. The project addresses the public policy needs specified in the Governor's *New York Energy Highway Blueprint* ("Blueprint").[1]

On February 1, 2013, in response to a November 30, 2012 order from the Commission in this proceeding, Con Edison and the New York Power Authority ("NYPA") filed an Indian Point Contingency Plan ("Plan") which included a proposal to build three Transmission Owner Transmission Solutions ("TOTS") as well as a plan for NYPA to issue a request for proposals ("RFP") for third party transmission and generation solutions. One of the TOTS is Con Edison's SIU project.

The SIU project will unbottle generation and transmission resources on Staten Island. It is a new resource and will be located in NYISO Zone J. The initial option for this project was to install a new 345kV feeder and the forced cooling of four existing 345 kV feeders; the new 1.5 mile feeder, interconnecting the Goethals substation to the Linden substation, would mitigate a contingency within New York City by installing a new double leg feeder into new positions at the Goethals and Linden substations. Based upon additional preliminary engineering and design work, the Company made certain changes to the project design. Instead of a new feeder installation, splitting an existing feeder between Goethals and Linden Cogen substations will provide a similar solution at a lower cost and with lower environmental impacts. The forced cooling of the existing four 345 kV feeders remains in the project scope and will increase transmission capacity between the Goethals, Gowanus, and Farragut substations. The forced cooling aspects of the project include the installation of ten refrigeration plants to increase transmission capacity between Goethals, Gowanus, and Farragut substations on the four 345

[1] A copy of the Blueprint can be found at: http://www.nyenergyhighway.com/PDFs/Blueprint/EHBPPT/.

kV feeders 25, 26, 41, and 42. The SIU project would be located in Staten Island and Brooklyn, New York and Union County (Linden), New Jersey.

As indicated in the Plan and in the accompanying materials, the SIU project is a new resource that can be in service by June 2016. A significant part of the Company's ability to deliver the SIU project within the specified timeframe is due to the fact that the SIU project does not need an Article VII permit. In addition, based an analysis conducted by Con Edison, the NYISO determined that a full System Impact Study ("SIS") was not required.

The Company's initial good faith estimate for this project was $312 million. Based upon additional preliminary engineering and design work, the Company made certain changes to the project design as described above. Based upon these changes, the new current good faith estimate is $248 million. While this project is being submitted by Con Edison, it is anticipated that the SIU project will eventually be completed and owned by the New York Transmission Company ("NY Transco") and will be one of several Federal Energy Regulatory Commission ("FERC") regulated transmission projects owned by the NY Transco. As such, the rates for this project will be based on a cost of service rate and, consistent with the requirements of the March 15th Order, will not be based on a fixed price nor will it be a merchant transmission facility. As the Commission recognized in its March 15th Order, "[w]e understand the TOTS cost estimates to be good faith estimates, rather than 'not to exceed' values."[2] While the Commission directed Staff to "evaluate TO and RFP projects on as comparable a basis as possible, it is neither necessary nor appropriate to provide identical cost recovery provisions for each."[3] It is anticipated that once it is in service, the SIU facility will be under the operational control of the New York Independent System Operator ("NYISO") and its rates included in the NYISO's Open Access Transmission Tariff ("OATT").

The SIU project is an upgrade to the statewide interconnected transmission grid. The state-wide benefits associated with upgrades to an interconnected transmission system were recognized in the Blueprint, which stated that:

> Ensuring the efficient transmission of power by reducing bottlenecks and developing advanced smart technologies improves overall electric system operation and optimizes the use of existing assets in New York by allowing lower-cost and cleaner power to reach consumers. Investments in the transmission and distribution systems can reduce customer costs over the long-term, improve safety and reliability, and protect the

[2] March 15 Order, p.18.
[3] Id.

environment while immediately creating jobs and economic development.[4]

The Federal Courts have also found that "[w]hen a system is integrated, any system enhancements are presumed to benefit the entire system." *W. Mass Electric Co. v. FERC*, 165 F. 3d 922, 927 (D.C. Cir. 1999).

Among the public policy goals that the SIU project will contribute to is an increase in economic development within New York State, including increased employment and increases in local tax revenues. Accordingly, the SIU project will provide benefits beyond its ability to replace some of the energy and capacity should the IPEC retire.

8.3 Description of Project

Unbottling Staten Island generation and transmission resources will require the splitting two legs (called the L&M legs) of an existing 345kV feeder and the forced cooling of four existing 345 kV feeders. The feeder split would mitigate a controlling contingency within New York City by establishing a second feeder into a new position at the Goethals and Linden substations. The forced cooling of the existing four 345 kV feeders will increase transmission capacity between Goethals, Gowanus, and Farragut substations. The Project would be located in Staten Island and Brooklyn, New York and Union County (Linden), New Jersey. This project is located in NYISO Zone J.

Splitting an existing feeder in-between Goethals and Linden Cogen will require new bus section installations. Both substations will need new 345kV breakers and bus modifications to establish new bus positions for the feeders and to maintain feeder separation. Linden Substation is an SF6 (sulfur hexafluoride) station that requires SF6 equipment to expand the station. Although Goethals Substation is an open air substation, due to limited space, the new bus position needs to be established using SF6 equipment. The scope also includes replacing the trifurcating joint at Linden Cogen and Goethals Substations, installing approximately 350 feet of 345kV cable at Linden Cogen and 500 feet of 345kV cable in Goethals Substation.

The project also includes the installation of ten refrigeration plants to increase transmission capacity between Goethals, Gowanus, and Farragut substations on the four 345kV feeders 25, 26, 41, and 42. Six of these plants will be installed in support of feeders 25 and 26; one each at the Gowanus and Goethals Substations and four along the route of the feeders. The plants along the route need to be sited equidistant to each other and the interconnecting

[4] Blueprint, p. 10.

stations. One of these locations is the current Bay Street property, which will hold two cooling plants.

The other property will hold another two plants in support of feeders 25 and 26 and will need to be acquired. The next four plants will be installed in support of feeders 41 and 42; two each at Gowanus and Farragut Substations. A one-line diagram of the project and a diagram illustrating the locations of the refrigeration plants are included in Exhibit A.

The impact of the SIU project towards reducing N-1/-1 deficiency post Indian Point Shutdown is approximately 440 MW. This impact is based on an application of the NYC Reliability Criteria. In general, transmission projects, such as SIU, will have an interaction with other transmission or generation projects that can be either positive or negative (*i.e.*, the stated impact may increase or may decrease). Therefore, it is critical that when a comprehensive portfolio analysis is conducted the impact of this Project would be re-calculated.

8.4 Proposer Experience

Con Edison and O&R are regulated public utilities that are subsidiaries of Consolidated Edison, Inc. ("CEI"), a holding company. In 2012, CEI had $41.2 billion in assets and $12.2 billion in revenues (please see CEI's 2012 annual report). Con Edison serves a 660 square mile area with a population of approximately ten million people. In that area, Con Edison serves approximately 3.3 million electric customers, 1.1 million gas customers, and 1,700 steam customers. Con Edison provides electric service in New York City and most of Westchester County, gas service in parts of New York City and steam service within the borough of Manhattan. Con Edison has approximately 1,180 circuit miles of transmission, including 438 circuit miles of overhead and 742 circuit miles of underground transmission.[5] Con Edison was incorporated in New York State in 1884 and its corporate predecessor, the New York Gas Light Company was founded in 1823.

O&R and its utility subsidiaries, Rockland Electric Company and Pike County Light & Power Company, operate in Orange, Rockland and part of Sullivan counties in New York State and in parts of Pennsylvania and New Jersey, and serve a 1,350 square mile area. O&R provides electric service to approximately 300,000 customers and gas service to approximately 100,000 customers in southeastern New York and in adjacent areas of northern New Jersey and northeastern Pennsylvania. O&R has approximately 558 circuit miles of transmission.

---

[5] A list of Con Edison's and O&R's transmission and generation facilities can be found in the *2013 Load and Capacity Data, A Report by the New York Independent System Operator "Gold Book,"* which is located at: http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2013_GoldBook.pdf.

Con Edison is a voting member and O&R is a non-voting affiliated member of the Transmission Owners sector of the NYISO. As transmission owners in New York, Con Edison and O&R helped to create the NYISO and its markets. As the utility responsible for providing electric, gas and steam service to the New York metropolitan area, Con Edison has developed numerous projects over the last ten years, all focused on providing safe, reliable and efficient service to its customers. Recently, Con Edison constructed and put into service the M29 transmission line.

With respect to project management, work on the SIU project will initially be managed by Con Edison engineers and project management professionals. Most of the work will be conducted by outside engineering and construction firms.

8.5 Project Information

Consolidated Edison Company of New York, Inc.
4 Irving Place
New York, New York 10003
Attn: Stuart Nachmias
Vice President, Energy Policy and Regulatory Affairs
Tel: 212-460-2580
Email: nachmiass@coned.com

Attn: Neil H. Butterklee, Esq.
Assistant General Counsel
Tel: 212-460-1089
Email: butterkleen@coned.com

It is anticipated that, while Con Edison will commence development of the SIU project, it will transfer the Project, as soon as it is able to do so, to NY Transco, a New York limited liability company proposed to be formed in July 2013 and co-owned by the following entities or their newly formed special purpose affiliates (subject, in the case of the public authorities, to the enactment of legislation enabling their participation): Con Edison/O&R, Niagara Mohawk Power Corporation d/b/a National Grid ("National Grid"), New York State Electric & Gas Corporation and Rochester Gas & Electric Corporation (together, "NYSEG/RG&E"), NYPA, Long Island Power Authority ("LIPA") and CH (collectively, the "NYTOs").

Con Edison's DUNS Number is 006982359.

8.6 Disclosure Statements

Neither Con Edison nor any of its affiliates have, during the past five years, been judged or found by any court or administrative or regulatory body to have defaulted on or failed to comply with any material obligation related to the sale or purchase of power (capacity, energy and/or ancillary services), transmission or natural gas.

Neither Con Edison, nor any of its trustees or "executive officers" (as defined by Rule 3b-7 promulgated under the Securities Exchange Act of 1934, as amended) or affiliates have, during the past five years, been convicted of (a) a felony, or (b) any crime related to the sale or purchase of electric power (capacity, energy and/or ancillary services), transmission or natural gas, conversion, theft, fraud, business fraud, misrepresentation, false statements, unfair or deceptive business practices, anti-competitive acts or omissions, or collusive bidding or other procurement or sale-related irregularities.

8.7 Financial Capacity to Complete and Operate the Proposed Project

The Company has completed the Financial Data Sheets, included as Attachment 5 to the NYPA RFP and attached hereto as Exhibit B, with respect to the Project. As discussed further below, the exhibits assume that the SIU Project will be transferred to NY Transco around spring 2014 and subsequently developed and financed by NY Transco.

Prior to its transfer to NY Transco, Con Edison will finance construction of the SIU Project in the same way that it currently finances its capital needs: by issuing long-term debt in the capital markets. Debt financing at Con Edison must be approved by the Commission via a financing order. Under the Company's current financing order, Con Edison has authorization to issue $3.5 billion of debt through December 2016. In addition, the Company's financing may be limited by the capital structure approved by the Commission. The Company currently has an approved equity ratio of 48%. Funding for the Project will take into consideration the Company's approved equity ratio.

Information concerning Con Edison's financial condition may be obtained upon review of the Company's audited financial statements, which are available publicly and accessible on the Company's website, at www.conedison.com or on the Securities and Exchange Commission's website, at www.sec.gov/edgar. The Company's unsecured debt is rated A3, A- and A-, respectively, by Moody's Investor Service, Inc. ("Moody's), Standard & Poor's Corporation ("S&P") and Fitch Ratings, Inc. ("Fitch"). CEI's long-term credit rating is Baa1, BBB+ and BBB+, respectively, by Moody's, S&P and Fitch. The commercial paper of both the Company and CEI is rated P-2, A-2 and F-2, respectively, by Moody's, S&P and Fitch. Securities

ratings assigned by rating organizations are expressions of opinion and are not recommendations to buy, sell or hold securities, and may be revised or withdrawn at any time by the assigning rating organization. Each rating should be evaluated independently of any other rating.

Accordingly, Con Edison expects to transfer the Project to NY Transco as promptly as possible upon the commencement of its operations (which is anticipated to occur following (i) enactment of necessary legislative changes and procurement of approvals, if applicable, of the Comptroller and/or Attorney General of the State of New York with respect to NYPA and LIPA's participation, as well as (ii) receipt of approvals by FERC of a transmission formula rate schedule and incentives, and (iii) implementation of cost allocation and cost recovery mechanisms through the NYISO's tariff, all of which are expected by the middle of 2014). It is expected that NY Transco will be able to obtain investment grade construction debt financing once its rate is approved by FERC, and that NY Transco will also receive various FERC incentives, including construction work in progress, that will reduce construction risk. Equity support will be provided to the Transco by the NYTO's investing affiliates during construction and, to the extent necessary, thereafter to support continued operations. It is anticipated that the NY Transco will make its formula rate filing at FERC during the summer of this year. As such, it is premature to specify the exact debt / equity ratio that will be approved by FERC for this project. However, for informational purposes, a 50/50 debt to equity capital structure is assumed in Exhibit B.

8.8 Environmental Benefits of Project

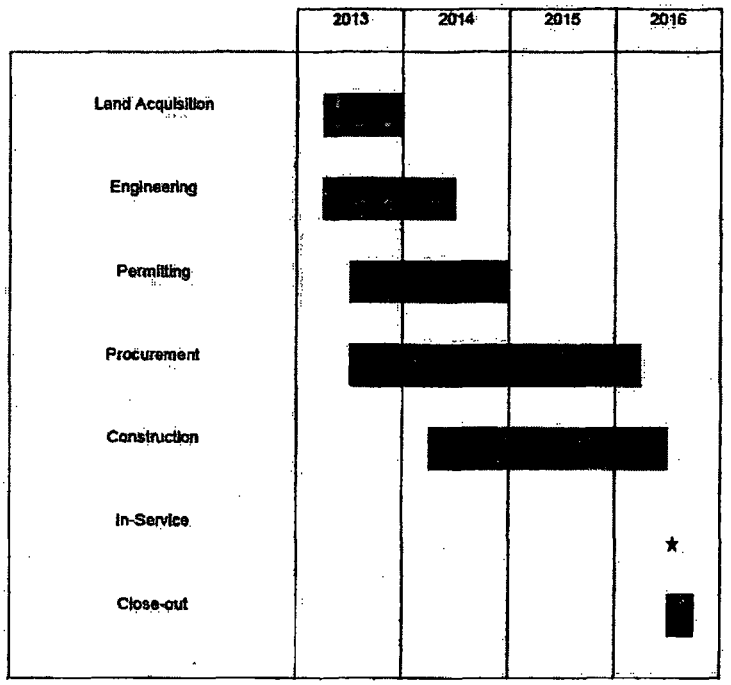
The Project's primary objectives are to meet the public policy goals stated in the Blueprint including: reducing congestion, providing economic benefits to local communities, encouraging renewables, enhancing the long-term reliability of the bulk power system and planning for a possible IPEC retirement. With respect to meeting the reliability need if the IPEC should retire, the SIU project will reducing the severity of a second contingency violation in New York City, and increasing transfer capability between the Staten Island generation pocket and the rest of the 345kV system in New York City.

The SIU project would allow greater access to generation resources in the Pennsylvania Jersey Maryland ("PJM") regional transmission organization. It is expected to increase imports from PJM into Staten Island and reduce the dispatch of local fossil generation within New York City and Long Island, leading to improved air quality and environmental health benefits to the densely populated metropolitan area.

8.9 Proposed Resource(s) Development Plans and Schedule

The following represents the current high-level schedule and work plan for the development of the SIU Project.

MS Project Gant Chart



Proposed In-Service Date May 2016

No contracts with NYPA are necessary to achieve this in-service date.

Proposed Date for PSC and FERC Orders

The following represent the proposed dates for key PSC and FERC approvals that are necessary to achieve the June 2016 in-service date.

1. PSC selection in Case 12-E-0503 – September 2013
2. FERC approval of NY Transco formula rate – mid 2014
3. FERC approval of NY Transco incentives – mid 2014
4. FERC approval of cost allocation for Transco projects – mid 2014
5. PSC approval of Section 70 asset transfer filing – 4th Quarter 2014

Timeline for award of Engineering, Procurement and Construction ("EPC") Contract

The EPC Contract will be performed in phases. The first phase, engineering, will be awarded by the third quarter of 2013.

Lead Times for Major Equipment

The following are the lead times for major equipment:

- Refrigeration Plants = **[Redacted]**
- 345kV SF6 Bus and breakers = **[Redacted]**

Plans for Construction and Operation

The construction work is expected to be performed by an EPC contractor. Once the project is operational, Con Edison may perform operation and maintenance ("O&M") services for the NY Transco with respect to the SIU project in accordance with the terms of an O&M Agreement between the parties and consistent with the affiliate rules of the Commission and FERC. Similar to other transmission assets in the State, the facility will be under operational control of the NYISO.

Community outreach plans

Con Edison's government relations and public affairs personnel will provide appropriate community outreach support for the SIU project until this function is assumed by the appropriate resources of the NY Transco. The organizational experience supporting major inter-utility projects such as the BEC and Hess projects and the construction of new substations ensures that the community outreach efforts will be successful.

Equity and Debt Financing Plans

Please see description of financing plans in section 8.7.

Contractor Experience

This information is not yet available as the EPC and other contractors have not yet been procured for this project. It is expected that contractors with appropriate experience and expertise will be hired at a reasonable cost.

Community Benefits

Please see the response to section 8.14 dealing with the Project's economic development benefits.

Taxes and/or PILOT agreements

Because transmission facilities are real property under the New York State Real Property Tax Law, the Company anticipates that local property taxes will be levied with respect to this facility by each municipality where the facility will be located and to New York State. Although property taxes throughout the State are generally based on the property's reproduction cost new less depreciation, rates vary significantly from jurisdiction to jurisdiction as well as from year to year, and therefore cannot be predicted with certainty. A generic assumption was used for estimating property taxes in the financial data sheet included in Exhibit B.

Site Control Status and Plans for Site Control

The following represents the site control plan for the SIU project.

- The project will affect 4 substations, Goethals, Gowanus, and Farragut (owned by Con Edison) and Linden Cogen (owned by Linden Cogen).
- Any parties requesting access / visitation to Con Edison substations shall have escorted access with Con Edison employees, at a time acceptable to Con Edison.
- Con Edison will request access to Linden Cogen's substation as needed throughout the project and will be contingent upon their availability.
- During construction, the project team will follow appropriate plans regarding the appropriate site control plans such as security guards, additional gate/barriers, and other related items.

Operations Plan

Con Edison estimates that the following incremental O&M will be required once the SIU facility is in service. Preliminary cost estimates are included in Exhibit B. The following is a list of the expected O&M activities once the assets are in-service:

- Manhole cleanings on an annual basis
- Increased operator staffing during summer operational period
- Operating coverage during scheduled and maintenance work
- Online monitoring for the new plants
- FM200 vendor inspection
- Third party fire monitoring
- Smoke detection semi-annual inspection and service
- Maintenance functions such as Fire extinguisher inspection and replacement, emergency lighting compliance, suppression system inspection, filter replacement.
- Minor facility repairs
- Refrigeration contractors to inspect as per manufacturer recommendation

Property Acquisition

The first two of the six cooling plants will be located at the terminal stations of feeders 25 and 26. The next two of the six cooling plants required to cool feeders 25 and 26 will be installed at the Bay Street property. The last two cooling plants will require the acquisition of new property. This new property needs to be located as close as possible to the route of feeders 25 and 26, large enough to hold two refrigeration plants, and needs to be located at the midpoint of Goethals Substation and the Bay Street plant. Acquisition of the property has not been completed, but work has begun as part of the initial authorization to proceed with this project. The property must be procured to accommodate the service date of May 2016. Due to potential land siting issues associated with the new property, the timeline and cost estimates to acquire the land and associated engineering and design elements may be subject to change, including potential higher land costs or increased project costs to accommodate design using available land. As such, the overall cost of the SIU project may be higher than the current estimate.

NYISO Interconnection Status

On January 18, 2013, the NYISO, as per Section 2.4.2 of the NYISO Transmission Expansion and Interconnection Manual,[6] determined that a full SIS was not required. Thus, no further NYISO studies are required. A one-line of the proposed interconnection points is included in Exhibit A.

Environmental Justice Issues

Con Edison will conduct an analysis of potential environmental justice concerns for the Indian Point Contingency projects in accordance with NYSDEC Commissioner Policy CP-29, *Environmental Justice and Permitting.* The analysis will identify any Potential Environmental Justice Areas to be affected, describe the existing environmental burden on the Potential Environmental Justice Area and evaluate the potential burden of any significant adverse environmental impact on the area.

EPC Cancellation provisions

Con Edison intends to include in any contract into which it enters in relation to the development and construction of the Project a right to terminate the contract at Con Edison's election for any reason. Upon such termination, the Company intends to require the contractor to stop performing all work and to cancel as quickly as possible all orders placed by it with subcontractors and suppliers, and to use all reasonable efforts to minimize cancellation charges and other costs and expenses associated with termination of work. The Company will also seek to enter into fixed price contracts, with payment contingent upon the achievement of certain milestones, to the greatest extent possible. While Con Edison intends to seek such terms, there can be no assurance that the Company will be successful in achieving them. In this regard, the Company notes that much of the equipment the Project requires will be highly customized; as a consequence, the Company does not expect to be able to cancel such orders (or that its contractor will be able to cancel such orders) once they are placed. The Company would expect that any proposer seeking to develop and construct transmission projects would be subject similar constraints.

8.10 Environmental Review

The environmental permitting plans for the Indian Point Contingency Projects were presented in earlier Con Edison PSC filings and are incorporated herein by reference.

---

[6] The Staten Island Unbottling project is contingent on the use of the Co-Gen position at the Linden Substation.

Permitting Plan:

The following sets forth a preliminary list of major permits/approvals which are expected to be filed (additional permits may also be required). These filings and reviews will take approximately six months to one year to complete. The exact timeframe would be determined through a pre-application conference with the New York State Department of Environmental Conservation ("NYSDEC"), Board of Standards and Appeals, the NYC Fire Department, and the New York City Department of Buildings to discuss the project and confirm permitting requirements.

1. NYC Zoning/Land Use Approval:

    a. Land use approval needed for cooling plants proposed outside existing Con Edison substations

    b. An application will need to be filed with the NYC Board of Standards and Appeals (BSA) and the local Community Board. An environmental impact review will also need to be submitted under the City Environmental Quality Review (SEQR as implemented by NYC)

    c. Once the approval process has been completed, Con Edison would need to apply for and obtain the necessary NYC construction approvals

8.11 Pricing – Transmission Project

Cost Estimate

[Redacted]

Pricing Assumptions

[Redacted]

Transmission Rates

[Redacted]

Supporting Financial Exhibits

[Redacted]

8.13 Halting Costs

Due to the unique nature of transmission projects, Con Edison will need to purchase equipment that may not be usable for any other project. As such, the halting mechanisms reflect the fact that once equipment is ordered, Con Edison must be able to recover 100% of the cost of such equipment, less any reductions available from cancellation provision in the procurement contract and realized salvage value. The halting mechanism also recognizes that in order to meet the In-Service Deadline, Con Edison has started preliminary engineering work for the project as well as steps necessary for land acquisition and will start equipment procurement activities as early as the third quarter of 2013. Thus, the halting mechanism must provide for the full recovery of costs incurred, as well as any contractual cancellation costs associated with such activities. It should also be noted that equipment procurement, engineering, and some construction activities will start even though not all of the required regulatory permits (environmental or community) will have been obtained as of this point in the project development schedule.

Recognizing the potential cost impacts to customers for the SIU project, Con Edison can state the estimated costs that it will incur for the SIU project at particular key points in time. Importantly, these estimates are based on conceptual project scopes and represent an order of magnitude reference for future project costs. As preliminary engineering and project tasks proceed, additional detail and certainty will support updated cost estimates. With respect to the SIU facility, the estimated costs of halting the project at the key points in time are shown below:

Staten Island Un-bottling Project	Date Halted	Estimated Partial At Risk Cost*
(Project Total: $248,000,000)	9/30/2013	**[Redacted]**
	3/31/2014	**[Redacted]**
	12/31/2014	**[Redacted]**
* The "Estimated Partial At Risk Cost" includes only an estimate of the committed dollars and do NOT include any cancellation charges that would be imposed by the contractors		

and equipment suppliers. The "Estimated Partial At Risk Costs" will be adjusted at the time of halting to include these costs. These costs are based on a 2016 in-service date estimate.

8.13 Cancellation Clauses

See response to item 8.9.

8.14 Other Requirements

List of Required Easements

Siting of the new refrigeration plant requires the purchase of new property, has not been completed, and is dependent on zoning and available properties, but it is anticipated to be purchased in a manufacturing zoned location in Staten Island. If not, special use permits will be required. At this time, no additional land rights are required to construct the substation upgrades at either Goethals or Linden Cogen substation in order to establish new bus sections for splitting the feeder.

Economic Development Benefits

Along with the other transmission projects proposed by the NY Transco in PSC Case No. 12-T-0502, this project is being proposed in order to accomplish the goals and objectives of the AC Order and the IP Order. In the AC Order the Commission sought transmission projects that increase transfer capability through the Central East and UPNY/SENY interfaces.[7] In the IP Order, the Commission sought solutions that could address the need that would result if the IPEC were to retire. Both of these orders seek transmission solutions to meet the objectives of the Blueprint. As described in this submission as well as in the Plan and in the NY Transco January 25, 2013 filing in Case 12-T-0502, this Project will provide the public policy benefits specified in the Blueprint.

Among the public policy goals that the SIU project will contribute to is an increase in economic development within New York State. Specifically, the SIU Project is estimated to cost approximately $248 million in 2016 dollars. As a result of this investment, the New York State economy will reap significant economic development benefits in the form of increased employment and increases in local tax revenues.

[7] AC Order, p. 2.

Based on analyses performed by the Working Group for Investment in Reliable and Economic Electric Systems (the "WIRES" group) in conjunction with the Brattle Group, this $248 million of investment will support an estimated 1,050 direct full time equivalent ("FTE") jobs and estimated 3,200 total FTE jobs.[8] The directly supported jobs represent those related to domestic construction, engineering and transmission component manufacturing. Indirect job stimulation represents suppliers to the construction, engineering and equipment manufacturing sectors as well as jobs created in the service industries (*i.e.*, food and clothing) supporting those directly and indirectly employed. The SIU project is also estimated to increase annual local tax revenue by approximately $6 to $9 million.[9]

Statement with Respect to NYPA Appendixes and Bid Documents

It is intended that cost recovery for the SIU project will be accomplished through regulated transmission rates and not via a contract with NYPA. As such, the provisions set forth on the NYPA appendixes and the bid documents are inapplicable to the SIU project. That being said, the Company is providing the attached documents to demonstrate its commitment to equal opportunity and diversity and to aid the Commission in reaching its decision regarding which projects should be selected. This statement and the inclusion of these documents satisfy the requirements of the Commission's March 15th Order in Case 12-E-0503, which required that Con Edison provide information that is comparable and at the same level as that sought from official responders to the NYPA RFP.

Accordingly, Con Edison has attached the following documents as Exhibit E to this response:

1. Policy on Sexual Harassment
2. Policy on Equal Employment Opportunity
3. Employment of Individuals with Disabilities, Disabled Veterans, and Other Qualified Veterans

---

[8] The direct and total job numbers are based on generic information included in the May 2011 report entitled *Employment and Economic Benefits of Transmission Infrastructure Investment in the U.S. and Canada*, which was developed by the WIRES group in conjunction with the Brattle Group. The report concluded that every $1.0 billion of transmission investment supports 4,250 direct FTE years of employment and 13,000 total FTE equivalent years of employment. This report can be found at the following link: http://www.wiresgroup.com/images/Brattle-WIRES_Jobs_Study_May2011.pdf.

[9] The estimated annual local tax revenue associated with these projects is based on a factor of approximately 2 to 3% of project capital costs, which is consistent with the NY Transco estimate provided in Case 12-T-0502.

In addition, the Company's 2012 Diversity Annual Report can be found at: 2012 Diversity Annual Report

8.15 Compliance Statement

It is anticipated that the Project will comply with applicable laws and regulations.

8.16 Project Benefit / "No Regrets" Analysis

In addition to the economic development benefits described above, the SIU project provides public policy benefits to New York State even if the IPEC does not retire. The project provides marginal economic and environmental benefits across the state by enabling more energy from potentially more efficient and lower cost generation resources in New Jersey to serve load within New York State. By unbottling generation on Staten Island, the project also would enable the delivery of solar and wind resources on Staten Island, should such resources be developed.[10] Even if IPEC does not retire, the project benefits long-term reliability by mitigating the controlling contingency within New York City and also provides more operational flexibility during maintenance outages.

[10] The City of New York has discussed potential development of such resources on its Fresh Kills site.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Proceeding on Motion of the Commission To Review Generation Retirement Contingency Plan	)))	**Case 12-E-0503**

REVISED INDIAN POINT ENERGY CENTER DEMAND MANAGEMENT PLAN OF CONSOLIDATED EDISON COMPANY OF NEW YORK, INC., NEW YORK STATE ENERGY RESEARCH AND DEVELOPMENT AUTHORITY, AND NEW YORK POWER AUTHORITY

INTRODUCTION

Pursuant to the April 19, 2013 order of the New York State Public Service Commission ("Commission") in the above-referenced proceeding,[1] Consolidated Edison Company of New York, Inc. ("Con Edison") and the New York State Energy Research and Development Authority ("NYSERDA"), in consultation with the New York Power Authority ("NYPA"), hereby submit their revised plan (the "Revised Plan") for energy efficiency, demand reduction, and combined heat and power ("CHP"). Con Edison, NYSERDA and NYPA (collectively the "Organizations") have jointly prepared the Revised Plan.

Specifically, the Revised Plan includes a joint program, to be implemented by Con Edison and NYSERDA, with support from NYPA, designed to achieve 100 MW of cost-effective peak demand reduction by summer 2016 within the Con Edison service territory. The 100 MW demand reduction will be coincident with the system peak and will be in addition to peak demand reductions that are currently included in the New York Independent System Operator ("NYISO") Resource Needs Assessment ("RNA"). In addition to the 100 MW, the

[1] Case 12-E-0503, *Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans*, Order Upon Review of Plan to Advance Transmission, Energy Efficiency, and Demand Response Projects ("April 19th Order").

Revised Plan also includes a 25 MW CHP program to be administered by NYSERDA and NYPA's plan to save an additional 15 MW through the Build Smart NY program. Accordingly, the Organizations respectfully request that the Commission approve the Revised Plan and allow the Organizations to move forward with its implementation.

I. BACKGROUND

The initial Indian Point Contingency Plan, filed with the Commission by Con Edison and NYPA on February 1, 2013 ("Initial Plan"), set forth a flexible approach that was designed to build upon Energy Efficiency Portfolio Standard ("EEPS") programs with incremental incentives designed to produce 100 MW of demand reductions by the summer of 2016, along with increased energy savings that would increase the likelihood of achieving the State's energy efficiency goals.[2] The April 19th Order (pp. 21-22) required that Con Edison and NYSERDA jointly file a revised plan, in consultation with NYPA that would expand or add specificity in the following areas:

1. The potential contribution of on-site baseload generation – CHP and distributed generation – beyond NYSERDA and NYPA CHP projects "in the pipeline";
2. The potential contribution of large customers in Con Edison's electric service territory who may be practically capable of switching from electric to steam-driven chillers;
3. Prioritization and segmentation of the markets for efficiency, load management and demand response, including which building types and other facilities Con Edison and NYSERDA intend to pursue aggressively and why;

[2] Case 12-E-0503, *Compliance Filing of Consolidated Edison Company of New York, Inc. and New York Power Authority with Respect to Development of Indian Point Contingency Plan*, February 1, 2013.

4. How many megawatts can be secured from what resource category at given cost/MW levels to make informed decisions on program targets budget, as well as the proposed source and nature of any required financial incentive;
5. The proposed means to discipline and minimize the level of project support required, including how the plan would limit financial support to projects that otherwise would not come online in a timely fashion and limit incentives to less than 100% of project costs; and
6. How the Revised Plan will build on and be integrated with existing programs like EEPS, Technology and Market Development ("T&MD") and the Renewable Portfolio Standard ("RPS").

The April 19th Order (pp. 22, 25) originally required that the Organizations file the Revised Plan within 45 days of the date of the April 19th Order. On May 31, 2013, Acting Secretary Cohen granted an extension of the filing date to June 19, 2013.

As directed by the Commission, Con Edison worked closely with both NYSERDA and NYPA and all the Organizations are jointly filing this Revised Plan for Commission approval. The Revised Plan builds on the Organizations' substantial and complementary experience in implementing a variety of clean energy and demand management programs including EEPS, Targeted Demand Side Management ("T-DSM"), Demand Response ("DR"), T&MD, Build Smart NY, and RPS. In this jointly-developed Revised Plan the Organizations have built upon their diverse experience in clean energy markets to share information, improve communication and confront challenges. The Organizations anticipate that these efforts and their joint implementation of the Revised Plan will enable customer participation and implementation of demand management solutions including energy efficiency, DR and CHP.

II. THE REVISED PLAN

The Revised Plan includes a joint program, to be implemented by Con Edison and NYSERDA, with support from NYPA that is designed to achieve 100 MW of cost-effective peak demand reduction in the Con Edison service territory by the summer of 2016. The 100 MW demand reduction will be coincident with the system peak expected to occur during the summer capability period,[3] and will be in addition to peak demand reductions that are currently planned for in the NYISO's RNA. The Revised Plan also includes a 25 MW CHP program to be administered by NYSERDA, and NYPA's plan to save an additional 15 MW through the Build Smart NY program.

A. The IPEC Program

The Indian Point Energy Center ("IPEC") Program is a joint program designed to achieve 100 MW of peak reduction by offering a peak-kW incentive targeting customer energy use that is coincident with the system peak. The incentive will be in addition to existing incentives for other demand management programs and is planned to include a bonus for large projects and project aggregations by large customers. Since the goal of the Revised Plan is to produce 100 MW of additional peak reduction by the summer system peak of 2016, the incentive will only be provided to projects verified by Con Edison or NYSERDA as having been completed during the period January 1, 2014 through May 31, 2016.

The IPEC Program will be funded by a uniform per kWh IPEC Reliability Surcharge imposed on all kWh delivered by Con Edison to its customers[4] exclusive of deliveries to NYPA's governmental customers under the Company's Schedule for PASNY Delivery Service

[3] For purposes of the Revised Plan, the system peak demand period is comprised of the hours between 12:00 pm and 6:00 pm on non-holiday weekdays during the period May 1 through October 31.
[4] As with funding for the Company's existing DR and T-DSM programs, the IPEC Reliability Surcharge will be collected through the Monthly Adjustment Clause ("MAC").

(PSC No. 12 - Electricity), who already participate in the NYPA Build Smart NY Program that will contribute to the IPEC Revised Plan goals. The IPEC Program incentive will be available to any electric customer within the Con Edison service territory that pays the IPEC Reliability Surcharge.

Con Edison and NYSERDA will share a goal of achieving the 100 MW peak reduction and will jointly implement the IPEC Program utilizing a single point of entry for all participants in order to achieve that goal. Marketing materials and offerings for the IPEC Program will include both Con Edison and NYSERDA logos and the IPEC Program will have a single application process for the peak kW customer incentive. As part of this effort, Con Edison and NYSERDA will develop a consistent measurement and verification ("M&V") protocol for customer peak demand reductions.

In order to achieve the IPEC Program's goal of a 100 MW of peak reduction by the summer of 2016, the program will necessarily focus its recruiting on Con Edison's large commercial and industrial ("C&I") customers, and will build upon Con Edison's and NYSERDA's existing EEPS C&I programs. However, the current overlap of programs, with unequal incentives and different designs and requirements across programs, could complicate achievement of the 100 MW peak reduction. For this reason, Con Edison and NYSERDA have an interest in pursuing solutions that are oriented to the market (*i.e.,* customers and contractors) and that allow their respective C&I programs to function in a complementary way. In order to provide a seamless and efficient IPEC Program, the incentives and program rules of the C&I programs should be made uniform for both EEPS kWh and IPEC Program kW incentives. Additionally, the existing programs should be made more efficient by removing the administrative burdens for allocating budgets between programs, easing the customer payback

criteria, and reconsidering the appropriate application level(s) of the Total Resource Cost test applied to EEPS programs. Con Edison and NYSERDA believe that these solutions are critical initial steps to support complementary program design. Further program alignment, including a joint MWh goal, has been discussed as a potential approach to orient programs to the market and to streamline overall program delivery, reporting, participation and implementation. Con Edison and NYSERDA see potential in further and more detailed discussion on a joint MWh goal pending the Commission's directive to implement the IPEC Program.

1. Joint Sales, Outreach and Marketing and Project Management Strategy

Con Edison and NYSERDA will work together as one team, presenting one program to customers, in order to achieve the IPEC Program goal. To support this effort, Con Edison and NYSERDA will maintain a single point of customer entry into the IPEC Program and a consistent process for sales, project management, outreach and marketing. Sales will be achieved through a joint sales approach administered by Con Edison and NYSERDA.

As is currently the case with the data center program,[5] Con Edison and NYSERDA will conduct weekly status meetings to review lead assignments, report on the status of projects, address any issues that may come up, discuss general program matters, and share market intelligence. Regularly scheduled marketing meetings will be held with participation from the appropriate representatives of Con Edison and NYSERDA. Con Edison and NYSERDA have already begun joint discussions regarding the development of program marketing materials, banners, webinar presentations, and media and advertising campaigns.

[5] The Data Center Program is a NYSERDA and Con Edison collaboration to help data centers reduce energy use, save on operating costs, and cut greenhouse gas emissions through more efficient use of electricity. Con Edison and NYSERDA work together to provide data center operators in Con Edison's service territory with targeted technical assistance and financial incentives to support energy efficiency. The collaboration has successfully helped customers reach energy goals and intelligently manage their electric load.

The IPEC Program will be promoted through coordinated outreach and marketing that leverages the complementary strengths and experiences of NYSERDA and Con Edison to deliver an integrated, co-branded solution that will be jointly administered. The IPEC Program outreach and marketing program will dovetail with the existing efforts of both parties to maximize customer engagement and deliver incremental program value through a single program entry point and messaging.

NYPA will support these efforts for NYPA Recharge NY customers. These customers are eligible to participate in the IPEC Program based on their contribution to the IPEC Reliability Surcharge.

2. Joint Performance Reporting

Con Edison and NYSERDA will maintain a robust and detailed accounting of IPEC Program details in order to: 1) provide feedback on program performance; 2) allow for geographical performance data to be used for electric distribution system planning; and 3) facilitate consistent and accurate reporting to regulators and stakeholders. For the reporting process to be effective, both Con Edison and NYSERDA will share or provide to the other organization immediate access to project-level performance details, including, but not limited to: location of project, measure-level impacts on peak demand, total size of incentive issued, and time of completion. Con Edison and NYSERDA recognize that their data and reporting systems may need to be aligned so that project level details can be co-filed and reviewed by Con Edison and NYSERDA and provided to Department of Public Service staff.

3. Customer Incentives

In its April 19th Order (p. 21), the Commission stated that it shares the concerns of several parties about the significant costs of the program set forth in the Initial Plan, and directed that the

Revised Plan propose the "means to discipline and minimize the level of project support required." To address that concern, and as is explained below, Con Edison and NYSERDA will adhere to the following four principles of price discipline in setting the IPEC Program incentives: Cost-effectiveness will be tested at the program level for hours of peak impact to determine whether the total IPEC Program will be cost effective. The cost of the IPEC Program will be measured against the benefits of avoided energy, avoided line loss, avoided generation capacity, avoided environmental impacts, and avoided transmission and distribution infrastructure capital expenditures.

1. Incentive offerings will be available for a limited time only, and subsequent offerings may be extended at a different price to reflect current market conditions and the extent to which the IPEC Program goal has been achieved.
2. The incentive design will be established based on the diverse and extensive program experience of both Con Edison and NYSERDA and will require meaningful customer cost-sharing.[6]
3. Incentives will be adjusted in response to evolving market forces, providing the ability to reduce ratepayer costs.
4. Marketing and outreach will focus on reaching customers and reducing peak demand in networks that are under load constraints during times of system peak, which will help to reduce or defer the long term costs of operating utility distribution infrastructure.

Con Edison has the responsibility to provide reliable service to its customers and achieving the IPEC Program goal will necessarily require an incentive that is significant enough to spur

[6] As described elsewhere in the Filing, cost share for participants represents approximately half of total project costs.

aggressive demand reduction activities that would not otherwise occur. Moreover, the short time frame for projects to be completed, installed, and verified for performance necessitates providing Con Edison and NYSERDA with the flexibility to adjust the incentive as necessary to respond on a near real-time basis to evolving market conditions and the extent to which the IPEC Program goal is being achieved. For that reason, Con Edison and NYSERDA are proposing a customer incentive that will elicit 100 MW of peak-kW reductions, with graduated bonuses for projects that deliver substantial peak demand savings greater than 500 kW,[7] and with the flexibility to adjust incentives as necessary.

4. Integration with Existing Programs

The April 19th Order (p.22) states that the Revised Plan must provide further detail on how it will build on or be integrated with existing programs like EEPS, T&MD and RPS.[8] Con Edison and NYSERDA intend to market the IPEC Program incentives by building upon and expanding the existing EEPS program implementation platforms (including implementation contractors, market partners, and existing leads) with the goal of minimizing operational disruption of the existing platform while expediting program rollout and participation in the IPEC Program. The ability to use the existing EEPS infrastructure will facilitate a rapid start up once regulatory approval and funding is secured.

Through aggressive marketing of the per-kW incentive, Con Edison and NYSERDA anticipate substantially greater interest in existing EEPS measures such as replacement of

[7] For example, if a 0.5 MW load reduction were achieved, the customer could receive a cash bonus to be determined by Con Edison and NYSERDA, for 1 MW reduced the bonus would be increased to an agreed upon amount, for 2 MW reduced the bonus would be increased further, and so forth for each MW of demand reduction achieved up to a maximum amount to be determined.

[8] Con Edison and NYSERDA evaluated including customer-sited renewables in the Revised Plan. However, it was determined that further discussion is required to understand and assess the technical capabilities, performance characteristics, and economic impacts on customers and developers before RPS eligible renewable can be included in the Revised Plan.

existing and end-of-life equipment with more efficient alternatives, particularly heating, ventilation and air-conditioning ("HVAC"), interior lighting and building management systems. In addition, the IPEC Program is expected to drive larger projects with potentially deeper kWh and kW savings through measures that are currently ineligible under EEPS.

To the extent that energy efficiency measures such as interior lighting and HVAC replacements may achieve deeper penetration within EEPS projects due to the additional peak-kW incentives offered through the IPEC Program, those kWh savings would be allocated towards existing EEPS goals. Importantly, those savings will more likely be obtained during the limited time available to achieve the 15x15 goal, since the time-limited availability of the peak-kW incentives should spur quicker installation of measures.

Con Edison and NYSERDA will develop an M&V process that will verify peak kW reductions resulting from the IPEC Program and will be designed to avoid duplicate or repetitive M&V processes per project to avoid customer delays and the waste of ratepayer money.

5. Customer Participation

The April 19th Order (p. 21) states that the Revised Plan must provide more detail on which building types (*e.g.*, owner-occupied buildings, Class B office buildings) and other facilities Con Edison and NYSERDA intend to pursue aggressively and why.

Con Edison and NYSERDA will target the following specific customer groups[9] that are most likely to offer the opportunity for significant peak demand reductions before the summer of 2016:

[9] In addition to the primary customer types identified above, there is also a collective potential for demand reduction among HVAC used by residential and small to medium businesses and institutions. The collective load reduction potential among these customers is significant, and should not be overlooked simply because they have relatively low individual demand.

- Located within the Con Edison Service territory – The IPEC Program will be available to all delivery customers within the scope of this project exclusive of deliveries to NYPA's governmental customers under the Company's Schedule for PASNY Delivery Service (PSC No. 12 - Electricity), who already participate in the NYPA Build Smart NY that contributes to the IPEC Program goals.[10]
- High Peak Demand - Marketing and outreach will focus on attracting customers with high peak demand and project developers with potential large scale projects at one or more locations. The IPEC Program will be designed to include solutions for large building owners and large customers of all building types. The IPEC Program will also address portfolios of multiple locations and chain accounts that aggregate to large demand.[11]
- Prior/Existing EEPS Participants - Customers who are currently planning EEPS projects, or who have already conducted small projects under EEPS, may be willing to expand the scope and depth of projects under the new incentive structure.
- Fuel Switching - Customers capable of fuel switching for summer air conditioning load (*e.g.*, electric to steam or electric to gas) represent high potential for either directly reducing peak load or preventing migration to the electric system. This opportunity includes customers willing to operate a hybrid chiller system,[12] which

[10] Includes NYPA Recharge NY customers who are eligible to participate based on their contribution to the IPEC Reliability Surcharge.
[11] Irrespective of whether the IPEC is closed, reducing the demand of large customers located within an existing or future Targeted Demand Side Management network provides significant value. The same is true for customers with poor load factors that achieve their highest demand peak during times of system peak.
[12] These customers would need to demonstrate or assure that the chiller is operating on steam during peak load times.

may include customers willing to install steam equipment using the Company's steam service.

6. Program Measures

Only those measures that reduce metered peak demand will be considered eligible for the peak-kW customer incentive. Accordingly, additional project or measure-level demand reductions occurring outside the window of system peak will not be eligible for the peak-kW incentive.

Con Edison and NYSERDA have experience using performance incentives to implement load shifting strategies by building operators. Performance incentives may be used to encourage 1) periodic or regular maintenance and 2) continuous commissioning of equipment and building management systems by trained operators.[13] Further, incentives would be available to facilitate training for operators.

Con Edison and NYSERDA will also consider the use of block bidding as a means to engage energy service companies and Original Equipment Manufacturers to accelerate acceptance of new technologies. This approach could support more broad and deep market engagement, aggregated load reduction projects, targeted technology or market segments. Block bidding could also provide a vehicle for cost containment by using a request for proposal ("RFP") process to solicit block bids that focus on key market segments or measure types that have large potential savings, but have for one reason or another not participated in the programs as otherwise would have been expected. Block bidding is designed to build upon the solid foundation already established by existing Con Edison and NYSERDA C&I programs and Con Edison's T-DSM

[13] A building management system is defined as a controls system that has the capacity to collect data, interpret the information and then take action. In addition to the basic functionality of equipment scheduling and alarm notification, it should enable the components of a cooling system to interact with each other to operate optimally by meeting cooling load demand with minimal energy usage.

without taking customers from those programs.[14] Any use of block bidding would be carefully designed to minimize disruption to existing EEPS programs.

7. Expected Load Reduction Contributions

Demand reduction opportunities fall into three categories of customer-sited measures: permanent load reduction, load management, and fuel switching. First, permanent reductions in peak load will be obtained through replacement of existing and end of life equipment with more efficient alternatives. These are the measures most likely to have existing incentives in place through existing EEPS programs. Only the impact on peak load reduction will be taken into account for calculation of the peak-kW reduction incentive.[15]

Second, by utilizing energy management systems, thermal energy storage, or battery arrays, customers can manage their load and remove kW from the system peak by transferring load to off-peak hours. Customer energy management has significant potential for not only removing MW from the system peak, but also for reducing the costs of operating the distribution system. As discussed in the previous section, performance contracting represents an opportunity for load management strategies so that long-term operations result in continued load reductions.

Third, fuel switching from electric cooling to steam or gas cooling directly removes peak MW from the electric system. The existing Targeted Steam AC Program, part of the T-DSM Program, requires that a chiller replacement project be located within one of the designated electric "targeted" networks. Expansion of the program to all of the electric networks would provide additional electric system benefits and provide customers with economically competitive cooling equipment alternatives. Alternatively, an equivalent amount of electric load relief can be

[14] Bidding would necessitate certain requirements for financial security or related mechanisms among the bidders to ensure performance

[15] As stated the Initial Plan, measures whose primary impact is exhibited during times of non-peak load conditions such as outdoor lighting and variable frequency drives will not be eligible for the peak kW incentive

obtained by utilizing a qualifying gas-fired chiller or absorber in lieu of the steam-powered equipment required as part of the Targeted Steam AC Program. Accordingly, the IPEC Program would supplement the current T-DSM Program by including incentives for both types of non-electric cooling equipment. By doing this, the IPEC would expand non-electric cooling incentives beyond the steam service territory and would be applicable to a larger customer base. This option would also provide customers with more options to meet their cooling requirements.

While some customers may elect to install only one of the above measure types, an operational goal of the program will be to encourage as many customer facilities as practical to install two or more measures. For instance, energy saving measures, when coupled with a comprehensive load management and energy storage system for a large building, or coupled with fuel switching, or both, can yield large peak reductions up to or even exceeding 500 kW. By encouraging large projects, the program aims to achieve cost savings through economies of scale, reducing the overall burden of recruiting and managing hundreds of small projects, while expediting the implementation of demand reductions by the summer of 2016. For this reason, and as described in greater detail below, awarding an additional incentive for projects that achieve a significant scale of demand reduction (*e.g.*, 500 kW or greater) would be beneficial to the IPEC Program.

8. Cost Estimates

The April 19th Order requires (p. 21) that the Revised Plan "include an integrated, fully justified 'supply cost curve' for acquiring peak reduction MW from efficiency, demand response, load management, on-site base load generation and fuel switching." The estimated costs of the IPEC Program measures are necessarily subject to further analysis, but the following presents the

Organizations' current estimate of the costs of the types of different measures that will be included in the IPEC Program.

a. Explanation of Cost Estimation Methodology

Con Edison and NYSERDA worked together to analyze legacy energy program activity and to utilize internal and industry partner expertise as sources for a robust cost analysis. This information was used as a basis for estimates of total project costs and incentives necessary to attract participation and influence project development in order to deliver the proposed 100 MW of peak demand reduction.

In addition, Con Edison and NYSERDA assembled and analyzed a substantial data set of existing projects - representing over 80 MW of peak demand reduction. This data set was assessed from the perspective of energy (kWh) savings, peak-demand (kW) savings, total project cost and incentives to the extent available for a particular load reduction strategy.

Market participants and subject matter experts were also consulted as additional sources for cost and performance information. This approach allowed Con Edison and NYSERDA to analyze data from multiple sources with special emphasis on the load management strategies that integrate energy storage (thermal and battery-based) and non-electric (natural gas and steam) air conditioning systems. Vendor prices were used to develop a comparison of equipment cost for various types of non-electric chillers. Information was collected on thermal storage costs and market potential from the developers of thermal storage installations in New York City as well as engineering professionals with relevant project experience. Estimates from market stakeholders were consistent with the average cost of thermal storage calculated from previous load management projects.

This data formed the basis of the estimates for incentives necessary to secure timely market attention and project completions though accelerated implementation of strategies that include permanent demand reduction, fuel switching, and load management strategies – as further described below.

b. Measures Evaluated for the IPEC Program

Permanent demand reduction - High efficiency electric chillers and light-emitting diode ("LED") lighting are measures currently offered in existing EEPS programs. Based on a recent study by Global Energy Partners, LLC[16] these measures have been identified as having a high market potential as well as a high potential for peak kW reduction. In addition to lighting and comprehensive cooling projects, the Organizations see broader opportunities for permanent demand reduction including controls and process upgrades at facilities such as datacenters and water treatment plants. The IPEC Program will pay for kW reduced for the installation of these measures on top of existing EEPS incentives. These technologies have proven their effectiveness in reducing demand. The additional incentive from the IPEC Program will increase the rate of replacement of old inefficient chillers and old lighting systems with new high efficient technologies.

Load management - Load management measures included in the cost estimation are energy storage (thermal or battery), building management systems ("BMS") and automated demand response ("AutoDR").[17] These technologies have made great strides in the last few

[16] I. Rohmund and G. Wikler, Global Energy Partners, *Energy Efficiency Potential Study for Consolidated Edison Company of New York, Inc., Volume 2: Electric Potential Report, Final Report*. March 2010. Available online: http://www.coned.com/documents/Volume_2_Executive_Summary.pdf

[17] For the purpose of this filing and the IPEC Program a BMS is defined as a controls system that has the capacity to collect data, interpret the information and then take action. In addition to the basic functionality of equipment scheduling and alarm notification, it should enable the components of a cooling system to interact with each other to operate optimally by meeting cooling load demand with minimal energy usage.

years and are now dependable resources for reducing peak demand. AutoDR equipped lighting controls (LED & fluorescent), window air-conditioners and packaged terminal air-conditioning units can provide strategic short term load curtailment. Thermal storage essentially stores thermal energy by making ice at night with electric chillers and then releasing the thermal energy to cool the building during the day when demand is greater on the system. Thermal cooling technology can be used for demand management at the individual customer level as well as for district cooling at a complex multi-building application or for process cooling. Energy storage is also a viable alternative for peak reduction if the battery or other energy storage system has to reduce the committed load for a six-hour duration. BMS is currently incentivized in existing EEPS programs; the IPEC Program will pay for kW reduced on top of existing incentives paid in order to encourage BMS installations and upgrades at a faster rate.

Fuel Switching; Steam or Gas – The existing Targeted Steam AC Program requires that a chiller replacement project be located within one of the designated electric "targeted" networks. The IPEC Program will incentivize steam customers outside of the targeted networks to convert their electric chillers to high efficiency steam or gas chillers. Incentives will also be offered to steam customers to discourage them from switching to an electric chiller. Those customers with an end of life steam chiller may currently opt to convert to electric chillers which contribute to load increases on the electric system. To avoid such conversions, the IPEC Program will also incentivize customers with existing steam chillers to upgrade to a new high efficiency steam chiller.[18]

[18] Steam turbine chillers are similar to electric chillers, in that they use traditional refrigerants and have a standard refrigeration cycle. The main difference is that steam turbine chillers utilize a turbine in lieu of a motor to turn the compressor. Another type of steam chiller the IPEC Program will incentivize is the double stage absorption chiller. This type of chiller utilizes a lithium bromide solution in an absorption refrigeration cycle. The refrigeration cycle is similar to the traditional cycle but has a generator in lieu of a compressor as well as an absorption section.

c. Estimated Total Cost of the IPEC Program

The IPEC Program budget is composed of customer incentives, plus planned costs for outreach, marketing, technical support, measurement and verification, administration, reporting and evaluation. Con Edison and NYSERDA expect that incentives representing a reasonable, minimum project cost share (*e.g.*, approximately accounting for half of project costs) will be a prime driver for the amplified activity necessary to reach the 100 MW goal. This will result in projects that include meaningful participant investment or project cost-share as a means to contain ratepayer costs supporting the program. In no case will the combined incentives paid through EEPS and IPEC exceed 100% of the project cost.

Con Edison and NYSERDA will closely monitor rates of program participation and progress in achieving load reductions and will revisit the incentive levels and project cost share approaches with the intent of increasing participant cost share as meaningful progress is demonstrated. Other steps to assure that estimated costs are reasonable and contained include a review by NYPA, in addition to the Con Edison and NYSERDA review, and input from market experts. Opportunities have been discussed and will continue to be sought to build on and leverage the IPEC Program with existing EEPS program platforms and customer and contractor relationships, including joint outreach, sales and marketing.

The information and process described above provide the foundation for incentives, outreach, marketing, measurement and verification, and administration and other anticipated program costs to achieve 100 MW of peak demand reduction by summer 2016. Based on market forecast estimates, this corresponds to a proposed full program budget of $220 million. As identified in Table 1 below, this cost includes the cost of incentivizing customers within the major measure categories discussed above, as well as technical support, operator training,

performance incentives, and program management costs (incl. marketing, administration, M&V, and reporting).

Table 1: IPEC MW Reduction Market Forecast and Proposed Program Budget

	Total IPEC Market Forecast MW	IPEC Budget (in millions)
Load Management	44	$77
Permanent Demand Reduction	40	$54
Fuel Switching	16	$15
Technical Support (including facility operator training & performance incentive)		$15
Program Management Costs		$58
Target IP Demand Reduction Budget	100	$219

9. Cost-Effectiveness

Con Edison and NYSERDA anticipate that an incremental program to reduce peak demand must be separate from the EEPS program from a regulatory policy perspective and guided by the following benefit cost test at the program level:[19]

$$\frac{Benefit}{Cost} = \frac{NPV(\text{Energy} + \text{LineLoss} + \text{Capacity} + \text{Environmental} + \text{T} + \text{D})}{NPV(\text{UtilityCosts} + \text{CustomerCosts} + \text{ProgramAdmin})}$$

The test will be applied at the IPEC Program level and will evaluate the benefits of the program for operations during hours of peak demand. Utilizing the best available projections for capacity, energy pricing, environmental impacts, and distribution costs yields a Benefit/Cost

[19] CHP and DR costs and benefits have been developed by NYSERDA to estimate levelized $/MWh and $/MW respectively.

ratio of 1.0. These projections are based upon IPEC remaining in service and all future cost projections assume the plant will remain in service through the foreseeable future. Should IPEC close, however, the cost of generation capacity and energy prices could increase significantly, making the IPEC Program far more cost effective.[20] Accordingly, it is notable that the IPEC Program is cost effective under current market conditions.

The IPEC Program's demand reduction target of 100 MW is based on Con Edison's and NYSERDA's best understanding of realistic achievable market potential within the short program window. Specifically, the 100 MW target is primarily based on the market potential for large projects to complete energy management solutions to remove on-peak demand. These projects take significant time to plan for and arrange for budgeting or financing. Accordingly, due to the short time before the contingency need (less than 5 years away), it is not realistic to plan for any additional MW reductions that could be achievable through this program. Alternatively, a smaller program target of less than 100 MW would not save an equivalent amount in program costs (*e.g.* $2.2 million per MW). Certain upfront costs in staffing, program administration, marketing, and outreach will not decrease proportionally to a decrease in MW reductions. A reduction in program goals might therefore result in a more expensive acquisition cost (*e.g.* greater than $2.2 million per MW) and a less cost effective program then what is described in this filing.

10. Source of Funding

The April 19th Order (p. 21) requires that the Revised Plan "propose the source and nature of any required financial incentive." Con Edison and NYSERDA propose that Con

[20] The cost of energy used in the benefit/cost test was based on the 2012 average weekday afternoon wholesale price of energy in NYISO Zones J & I. This period had an abnormally low cost of peak energy, as excess natural gas capacity kept fuel prices at historically low levels.

Edison delivery customers will pay a surcharge to cover the cost of the IPEC Program, on an arrears basis (after the costs have been incurred), through the MAC charge as is done for the DR and T-DSM programs, exclusive of NYPA's governmental customers who receive delivery service under the Company's PSC No. 12 -- Electricity.

Finally, Con Edison will not seek a shareholder incentive for the implementation of the IPEC Program.

B. NYSERDA CHP Program

1. Introduction

NYSERDA will administer the CHP portion of the IPEC Program. This will consist of an expansion of the existing T&MD CHP Acceleration Program, and is hereinafter referred to as the Expanded CHP Acceleration Program.

2. CHP Program Goals and Customer Incentive

The Expanded CHP Acceleration Program will achieve 25 MW of peak load reduction via CHP, all to be operational by Summer 2016, and will be administered with the existing T&MD $1,600/kW portfolio-average incentive rate of direct incentives to customers (thus, 25 MW at $1,600/kW would represent $40 million of direct incentives to customers). In addition, as further described below, additional costs will be incurred to support the activities of technical assistance contractors and outreach contractors, as well as NYSERDA administrative costs (such as NYSERDA staff salaries and benefits, Measurement & Verification, NYS Cost Recovery Fee, etc), resulting in a total cost to the ratepayers of $66 million (thus $66 million delivering 25 MW represents $2,640/kW for the "all-in" ratepayer cost).

3. Measure Characteristics to Incentivize

The Expanded CHP Acceleration Program will support the installation of CHP systems in the size range of 50 kW to 1.3 MW using vetted equipment which has been admitted into the program's catalog.

4. Expected Load Reduction Contributions

Load reductions will occur throughout the May-October peak demand period in the amount of 25 MW. The CHP projects funded by the Expanded CHP Acceleration Program will be designed to operate during these peak hours, and all projects must demonstrate to NYSERDA that operation throughout these peak hours is in the financial best interests of the project proponent. For example, the project proponent may demonstrate that the tariff which will apply provides a clear economic signal that impels operation of the CHP system throughout these peak hours, and that failure to operate throughout these peak hours would cause a financial penalty attributable to the tariff. The MW accomplishments to be claimed by the program will consist of that fraction of the CHP system demonstrating to NYSERDA that operation throughout these peak hours is in the financial best interests of the project proponent, plus that additional fraction of the CHP system confirmed to be enrolled in a demand response program, and will total 25 MW.

5. CHP Program Operations

NYSERDA will administer the Expanded CHP Acceleration Program to deliver energy savings and permanent peak-demand savings via CHP (such reduction in peak demand will occur when customer-self-generated electricity is substituted for a fraction of what the customer would otherwise consume and demand from the grid), consisting of customer-sited generators

operating on natural gas to produce both electricity and useful thermal energy in a clean and efficient manner, as further described below.

The Expanded CHP Acceleration Program will utilize an expansion of the existing catalog of pre-qualified equipment which is eligible for the program's incentives. Based on vendor submittals received, it is expected that the catalog will be further expanded to include a suite of steam backpressure turbines across a range of sizes within the program's 50 kW to 1.3 MW limits.

In addition to these activities via the IPEC contingency funding for CHP, NYSERDA has also requested federal Sandy Relief funds to install CHP throughout the 17-county affected area (much of such territory overlaps with the IPEC territory). Therefore, if the federal funds do indeed materialize, any CHP thus federally-funded and located within the IPEC zone will be counted towards timely achievement of the above-enumerated goal (and, at the discretion of the Commission, after thereby achieving the above-enumerated goal, the uncommitted IPEC funds could either be used to deliver additional CHP which would be installed at some eventual date, or as otherwise directed).

6. Integration with Existing CHP Programs

The existing T&MD CHP program consists of two formats (the CHP Acceleration Program, also known as the "Catalog" program, supports pre-qualified pre-engineered CHP modules in the size range 50 kW to 1.3 MW, while the CHP Performance Program supports custom-engineered CHP systems larger than 1.3 MW). The approved T&MD CHP funds, totaling $75 million, consist of $25 million dedicated to the CHP Acceleration Program, and $50 million dedicated to the CHP Performance Program, as further described below.

The existing CHP Acceleration Program has issued a statewide solicitation (PON 2568) which makes available $20 million of the $25 million in the form of direct customer incentives (the remaining $5 million will be used for other marketplace assistance activities, including but not limited to collection and posting of system performance data, re-commissioning activities at installation sites, technical assistance contractors for review of modules seeking admittance to the Catalog, technical assistance contractors for assisting host sites with evaluating prospectuses from various equipment vendors, conferences and other outreach activities, and the like). The CHP Performance Program has issued a statewide solicitation (PON 2701) which makes available $40 million of the $50 million in the form of direct customer incentives (the remaining $10 million will similarly be used for other marketplace assistance activities). Thus, $60 million of the $75 million T&MD funds are available as direct incentives to eligible customers.

The T&MD CHP program is expected to achieve 37.5 MW of peak load reduction via CHP installations (12.5 MW via the CHP Acceleration Program, plus 25 MW via the CHP Performance Program) to become operational in accordance with target dates as specified in the approved T&MD Operating Plan (not all of this is expected to occur in Con Edison territory, and not all of this is expected to be operational by Summer 2016). Thus, the portfolio-average incentive rate of direct incentives to customers is $1,600/kW ($60 million/37.5 MW). The proposed 25 MW of CHP for IPEC is above and beyond what current funding (SBC3, and SBC4/T&MD) is expected to otherwise deliver by Summer 2016, i.e., NYSERDA-funded projects in the pipeline that are expected to occur by the critical time and not already reflected in the RNA.

7. NYSERDA would initially target specific Customer types for participation in the Expanded CHP Acceleration Program

In addition to promoting uptake of all items in the Catalog, the Expanded CHP Acceleration Program will undertake a dedicated effort of outreach to the Con Edison steam customers, informing them of the opportunity to install a steam backpressure turbine "in parallel" with their steam inlet pressure reducing valves, so that the building could use the backpressure turbine to achieve pressure reduction while generating electricity on-site (reduce the steam pressure from circa 100 psi in the street, to approximately 15 psi for distribution throughout the building). Incentives for installation of a backpressure steam turbine would be pro-rated to the electric production during the summer period, and thus, other improvements at the site which increase summer steam consumption (such as the installation of steam absorption chillers) would improve the economics of the backpressure turbine. Thus, Con Edison and NYSERDA will promote concurrent adoption of steam absorption chilling (through a jointly-administered program) and steam backpressure turbines (through the NYSERDA-administered Expanded CHP Acceleration Program). Although not the primary objective of the IPEC contingency planning effort, by virtue of these capital investments in modern steam-related equipment, this would provide a desirable co-benefit of reinforcing customers' long-term commitment to the Con Edison steam system.

8. Cost of Acquiring CHP Peak Reductions

NYSERDA is keying the costs of the Expanded CHP Acceleration Program primarily to the costs for CHP authorized recently by the Commission via the T&MD program. This information was used as a basis for estimates of project incentives necessary to attract participation and influence project development in order to deliver the proposed 25 MW of CHP. NYSERDA currently plans that such additional incentives will be administered in an identical

manner, and thus deliver a signal to the marketplace that there is no advantage to waiting for the IPEC Program funds to become available, and thereby emphasize prompt participation in the program as currently funded via T&MD. Notwithstanding this intent, NYSERDA recognizes the need for any and all necessary flexibility and nimbleness to adjust the program in response to market conditions in order to establish and maintain the urgent momentum necessary to meet the intensive goal of the program. Additional costs, for technical assistance contractors and outreach contractors, have been developed to support these crucial activities which will supplement the direct-incentives aspect of the program.

The additional CHP activities herewith described, to be funded via $66 million of IPEC contingency plan funds to achieve an additional 25 MW of peak load reduction via CHP would represent $40 million of direct incentives to customers. The remaining $26 million will be used for other marketplace assistance activities, which would by necessity be more-intensive than similar activities originally planned under the T&MD program (of this $26 million, $16 would be used for Outreach and Technical Assistance Contractor activities, while $10 million would be used for administrative functions such as NYSERDA staff salaries and State Cost Recovery Fee and Program Evaluation tasks).[21] For the expanded portion of the program, $16 million will be allocated for Technical Assistance Contractors and Outreach Contractors, which represents a $6 million "adder" compared to the $10 million for Technical Assistance Contractors and under T&MD to support an equivalent amount (25 MW) of CHP – note that the T&MD CHP Acceleration Program does not utilize any Outreach Contractors, so this additional feature

[21] These administrative functions are budgeted at 8% for NYSERDA staff salaries and benefits, 2% for State Cost Recovery Fee, and 5% for Program Evaluation, totaling 15%. The computation is based on program costs ($40 million direct incentives plus 16 million Technical Assistance Contractors/Outreach Contractors = $56 million) as follows: $56 million divided by 85% = $66 million "all-in" ratepayer costs. Note that $66 million times 15% = $10 million and $56 million plus $10 million = $66 million.

accounts for the need for these proportionately-additional funds. This need to specifically establish Outreach Coordinators for the Expanded CHP Acceleration Program is due to the need to drive an additional batch of customers into the program above-and-beyond the customers expected to be attracted through the efforts of the CHP system vendors to the base T&MD program. Due to the urgency and compressed timeline, a dedicated Outreach effort is planned to consist of the following two components: (1) outreach and coaching of Con Edison Steam customers to consider steam backpressure turbine CHP, and (2) a "hear from CHP experts and meet the pre-qualified CHP equipment vendors" expo to occur at venues in numerous neighborhoods throughout New York City. These two new Outreach activities are crucial, will require "adder" funds, and are the preferred strategy to drive participation in the CHP program by helping the CHP vendors with customer acquisition challenges (as opposed to a strategy of further enhancing the direct incentive to customers). In order to meet the fast-paced timeline, it is expected that these additional megawatts of CHP installations will occur through an expansion of the CHP Acceleration Program.

The fully-loaded budget is composed of customer incentives, plus planned costs for outreach, marketing, technical support, measurement and verification, administration, reporting and evaluation important to effective management of the program. It is expected that these incentives, which have already been established under the T&MD program to represent a reasonable, minimum project cost share (approximately half or more to be invested by the customer), will be a prime driver, but will also rely on intensified outreach efforts to create an amplified activity necessary to reach the 25 MW goal. The continued use of meaningful participant investment, or project cost-share, will be a means to contain ratepayer costs supporting the program. If necessary, budget adjustments may occur to move funds between the

incentive pool and the Technical Assistance Contractors/Outreach Contractors pool. For example, if the Outreach effort proves very effective early in the program and facilitates sufficient customer acquisition, but those customers materialize overwhelmingly on the smaller end of the CHP size spectrum, the $40 million budget for direct incentives to customers may not be sufficient to achieve the 25 MW goal[22] and thus a reallocation of funds out of the Technical Assistance Contractors/Outreach Contractors pool and into the direct incentives pool would be appropriate.

9. Source and nature of any required financial and Expanded CHP Acceleration Program costs

The information and process described above provide the foundation for incentives, outreach, marketing, measurement and verification and other anticipated program costs which corresponds to a proposed full budget of $66 million to be funded with IPEC Contingency Plan funds to expand the T&MD CHP Acceleration Program into the NYSERDA-administered Expanded CHP Acceleration Program to achieve an additional 25 MW of peak demand reduction by Summer 2016.

C. NYPA Build Smart NY Program

NYPA has been working with several New York City and State agencies to identify incremental demand reductions based on long term capital planning and expects to achieve an additional 15 MW of peak demand reductions not accounted for in the 2012 RNA (some projected achievements from Build Smart NY are already included in the 2012 RNA)."[23] State agencies and authorities are working to accelerate energy efficiency in State facilities,

[22] The CHP Acceleration Program, and hence the Expanded CHP Acceleration Program, is budgeted for a portfolio-average direct incentive to customers at $1,600/kW and, in order to capture the economies-of-scale, uses a sliding scale of baseline incentives ranging from 50 kW at $1,800/kW to 1.3 MW at $1,150/kW. Additionally, two bonuses are available either singly or jointly, consisting of a 10% bonus for systems installed at critical facility sites, and/or a 10% bonus for CHP systems installed within Con Edison's Targeted Zones.

[23] Note that this would be over and above the 100 MW targeted by the IPEC Program.

particularly in light of Governor Cuomo's recently issued Executive Order 88 which mandates a 20 percent energy use reduction by April 2020. Additionally, the incremental demand reductions include work associated with aeration and de-watering system upgrades at wastewater treatment plants in New York City as well new efficiency opportunities identified in master energy plans that are envisioned for university campuses in New York City. Equipment at many of the wastewater treatment plants has outlived its useful life and there has been significant advancement in the technology that can be employed to further reduce high level energy consumption at these facilities. Campus-wide ASHRAE Level II audits will help identify capital energy efficiency retrofits. In addition to energy efficiency measures, the audits will help to identify opportunities for cost effective on-site renewable generation and potential for CHP projects. All NYPA Energy Efficiency Program projects are funded through NYPA low cost financing which is recovered from the direct program participants.

CONCLUSION

For the reasons set forth above, Con Edison, NYSERDA and NYPA respectfully request that the Commission approve the Revised Plan and allow them to move forward with its implementation.

Dated: New York, NY
June 19, 2013

Respectfully submitted,

CONSOLIDATED EDISON COMPANY
OF NEW YORK, INC.
by its Attorney,

Daniel W. Rosenblum
Associate Counsel
Consolidated Edison Company
of New York, Inc.
4 Irving Place, 1875-S
New York, NY 10003
(p) 212-460-4461
(f) 212-677-5850
rosenblumd@coned.com

By: */s/ Peter Keane*
Peter Keane
Associate Counsel
NYSERDA
17 Columbia Circle
Albany, New York 12203-6399
(p) 518.862.1090, ext. 3366
(f) 518.862.1091
prk@nyserda.ny.gov

By: */s/ Glenn D. Haake*
Glenn D. Haake
Principal Attorney
New York Power Authority
30 South Pearl Street – 10th Floor
Albany, New York 12207-3245
(518) 433-6720
glenn.haake@nypa.gov

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 12-E-0503 - Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans.

ORDER ACCEPTING IPEC RELIABILITY CONTINGENCY PLANS, ESTABLISHING COST ALLOCATION AND RECOVERY, AND DENYING REQUESTS FOR REHEARING

Issued and Effective: November 4, 2013