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Via Electronic Delivery

October 3, 2016

Mr. Michael Bemis
Chairman of the NYISO Board of Directors
c/o Mr. Brad Jones
President and CEO
New York Independent System Operator, Inc.
10 Krey Boulevard
Rensselaer, NY 12144

Re: Comments of Independent Power Producers of New York, Inc. on Proposed NYISO Installed Capacity Demand Curves and Request for Oral Argument

Dear Chairman Bemis:

In accordance with Sections 5.14.1.2.2.4.9 and 5.14.1.2.2.4.10 of the New York Independent System Operator, Inc.'s ("NYISO") Market Administration and Control Area Services Tariff and Section 5.6.6 of the NYISO's Installed Capacity Manual, enclosed please find comments of Independent Power Producers of New York, Inc. ("IPPNY") to the NYISO Board of Directors on the NYISO Staff's *Proposed NYISO Installed Capacity Demand Curves For Capability Year 2017/2018 and Annual Update Methodology and Inputs For Capability Years 2018/2019, 2019/2020, and 2020/2021* issued on September 15, 2016.

Additionally, IPPNY respectfully requests the opportunity to engage in oral arguments before the NYISO Board of Directors on the issues addressed in the enclosed submission and those of other market participants.

Respectfully submitted,

READ AND LANIADO, LLP
Attorneys for Independent Power Producers
of New York, Inc.

By: *David B. Johnson*
David B. Johnson

COMMENTS OF INDEPENDENT POWER PRODUCERS OF NEW YORK, INC. ON PROPOSED NYISO STAFF INSTALLED CAPACITY DEMAND CURVES

Independent Power Producers of New York, Inc. ("IPPNY")[1] hereby submits the following comments to the New York Independent System Operator, Inc. ("NYISO") Board of Directors ("Board") on NYISO Staff's final recommendations for its *Proposed NYISO Installed Capacity Demand Curves For Capability Year 2017/2018 and Annual Update Methodology and Inputs For Capability Years 2018/2019, 2019/2020, and 2020/2021* (the "Final Staff Report").[2] In the Final Staff Report, NYISO Staff expressly concurs with the vast majority of recommendations of the NYISO's independent consultants, the Analysis Group, Inc. ("AG") and Lummus Consultants International, Inc. ("Lummus") (the "Consultants") in their final report for the Installed Capacity ("ICAP") Demand Curves, including the Consultants' recommendations that (1) the proxy peaking unit for the New York City ("NYC"), Long Island ("LI") and Lower Hudson Valley ("LHV") Zones should continue to be an F Class Frame unit with dual fuel capability equipped with selective catalytic reduction ("SCR") emission controls, (2) the Consultants' proposed financial parameters are necessary to adequately account for the various risk factors faced by developers and (3) the zero crossing points and slopes for each Demand Curve should be retained.

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[1] IPPNY is a not-for-profit trade association representing nearly 100 companies involved in the development and operation of electric generation facilities and the marketing and sale of electric power in New York. IPPNY is acting through its members on the NYISO Management Committee ("MC"). IPPNY submits its comments pursuant to Section 5.6.6 of the NYISO Installed Capacity Manual and Section 5.14.1.2.2.4.9 of the NYISO's Market Administration and Control Area Services Tariff ("Services Tariff"). Pursuant to Section 5.14.1.2.2.4.10, IPPNY respectfully requests the opportunity for oral argument on this matter.

[2] *See Proposed NYISO Installed Capacity Demand Curves For Capability Year 2017/2018 and Annual Update Methodology and Inputs For Capability Years 2018/2019, 2019/2020, and 2020/2021 – NYISO Staff Final Recommendations*, NYISO (Sept. 15, 2016), http://www.nyiso.com/public/webdocs/markets_operations/market_data/icap/Reference_Documents/2017-2021_Demand_Curve_Reset/NYISO%20Staff%20Final%20DCR%20Recommendations%20-September%2015%202016.pdf.

Staff erroneously departed from the Consultants' recommendations in one important respect, however. Staff recommends a gas-only F Class Frame unit peaking plant configuration with SCR emission controls for the Rest of State ("ROS") proxy peaking unit. To ensure that the Demand Curves will accurately reflect the cost of new entry, it is critical that the Board adopt:

- the recommendation of Staff, the NYISO's independent Market Monitoring Unit ("MMU"), which is attached to the Final Staff Report, and the Consultants to use a dual fuel proxy peaking unit for the NYC, LI and LHV Zones;
- the recommendation of the MMU and the Consultants to use a dual fuel unit for the ROS proxy peaking unit rather than Staff's recommendation to use a gas-only unit for the ROS proxy peaking unit;
- the recommendation of Staff and the Consultants that the proxy peaking units in all Zones be configured with SCR;
- the recommendation of Staff and the Consultants that the Iroquois 2 pipeline should be designated as the natural gas hub for Zone G;
- an assumed property tax rate for the proxy peaking units outside of New York City that is higher than the recommended 0.75% to reflect the recent pressures on municipalities to maximize tax revenues from new gas-fired generators;
- a higher cost of debt for the proxy peaking units than Staff's and the Consultants' recommendation to more accurately reflect the risks that developers face; and
- the recommendation of Staff and the Consultants that the level of excess adjustment be based on the recent CARIS 2 database without any adjustments to the resource mix.

I. The Board Should Adopt the Consultants' and the MMU's Recommendation That the ROS Proxy Peaking Unit Be Configured with Dual Fuel Capability Instead of Staff's Recommendation that the ROS Proxy Unit Be Gas-Only.

IPPNY strongly supports Staff's and the MMU's concurrence with the Consultants' recommendation that the determinations reached in the last reset process to include dual fuel capability for the proxy peaking units in the LHV, NYC, and LI Zones remain just and reasonable, and, thus, the proxy peaking units should continue to be configured with dual fuel capability in these zones. The need for siting flexibility in this part of the system, which continues to be highly constrained, and reliance on natural gas as the predominant fuel remain key considerations supporting the need for dual fuel capable proxy units in the LHV, LI and NYC Zones.

While Staff correctly recommends dual fuel capability for the LHV, NYC and LI proxy units, its recommendation that the ROS proxy unit be gas-only is flawed and should be rejected. Instead, the Board should adopt the recommendation of the Consultants and the MMU that the ROS proxy plant be configured with dual fuel. To justify its divergence from the Consultants' recommendation that a dual fuel capable unit be used in the ROS, Staff contends that, unlike in other Zones, the local gas distribution companies ("LDCs") in Zones C and F do not mandate dual fuel capability. Staff asserts that this moots the siting flexibility advantages inherent with dual fuel capability because a gas-only plant could be sited throughout the LDC systems in Zones C and F. According to Staff, the use of a gas-only proxy unit in the ROS is reasonable due to the absence of a dual fuel mandate, the general availability of gas in Zones C and F, and "the fact that the estimated incremental net EAS revenues for dual fuel units in Load Zones C

and F do not offset the increased capital costs of such capability over the historic period analyzed in determining the ICAP Demand Curves for CY 2017/18."[3]

The Board should reject Staff's recommendation that the ROS peaking unit be gas-only because it failed to adequately take into account numerous critical factors identified by the MMU and the Consultants. As the Consultants and the MMU correctly recognized, the Consultants' estimate that a gas-only unit would have a slightly lower net cost of new entry ("net CONE") than a dual fuel unit does not account for the reliability and hedging benefits of dual fuel that were not captured in the Consultants' quantitative analysis.[4] In addition, as the MMU found in its comments recommending that the ROS proxy unit be dual fuel, the Consultants' model assumes a 10% gas premium and discount on intraday gas purchases and sales, respectively, in the ROS under all conditions.[5] The MMU demonstrated that this simplifying assumption is not a concern for a dual fuel unit because it would burn oil during high gas price days, but it is a concern for a gas-only unit because it may over-estimate the net revenues of a gas-only unit on high gas price days, thereby underestimating the net CONE of a gas-only plant.[6] The MMU stated that "the use of a dual fuel unit would make the analysis less sensitive to the Consultants' assumptions about gas availability during tight gas market conditions, and it would be more consistent with recent entry decisions in Zone F."[7] The MMU concluded that "the demand curve should be set based on the most economic type of resource, which is most likely the dual fuel unit."[8]

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[3] *Id.* at 5.

[4] *Id.* at 75.

[5] *Id.*

[6] *Id.*

[7] *Id.*

[8] *Id.*

When assessing this issue in the last reset process, the Federal Energy Regulatory Commission ("FERC") determined that the State's growing reliance on natural gas as the predominant fuel for generators, coupled with the fact that siting in close proximity to interstate pipelines and procuring firm capacity are prohibitively expensive undertakings, support incorporating dual fuel capability into the proxy unit's design.[9] These factors remain probative today. Indeed, as the NYISO has highlighted in its Power Trends 2016 report, New York's dependence on facilities fueled by natural gas has only grown since the last reset process, rising from 55% in 2012 to today's level of 57%, a trend that, as discussed below, is expected to continue for the foreseeable future.[10]

The Consultants' findings are further supported by a review of current and projected system conditions. As Staff recognized, dual fuel facilities provide important reliability benefits "particularly in consideration of the potential future unit retirements and increasing levels of intermittent renewable resources, both of which may further increase reliance on gas fired capacity in New York."[11] Natural gas facilities will, in fact, be needed to balance the large amount of renewable power that is anticipated to be developed to meet the State's clean energy goals. Indeed, the NYISO has commissioned its Clean Power Plan study, in part, to identify and quantify increased ramping and regulation needs on its system. Given that the State's newly implemented Clean Energy Standard ("CES"), requiring that New York, *inter alia*, procure 50% of its electricity from renewable energy resources by 2030, far surpasses the levels otherwise required under the Clean Power Plan, the impact on ramping and regulation requirements will

[9] *See New York Independent System Operator, Inc.*, 146 FERC ¶ 61,043, at P 83 (2014) ("2014 DCRP Order").

[10] *Power Trends 2016: The Changing Energy Outlook*, NYISO (July 5, 2016), at 3, http://www.nyiso.com/public/webdocs/media_room/publications_presentations/Power_Trends/Power_Trends/2016-power-trends-FINAL-070516.pdf.

[11] *See* Staff Final Report at 5.

only be magnified.[12] Thus, New York's growing dependence on fuel-diverse, more flexible units is expected to continue in the coming years. Yet, it has come at a time of ever-increasing difficulties in siting new gas pipelines, making dual fuel capability critical.[13]

Moreover, as revealed by the NYISO's report for the 2013–2014 peak winter conditions, a number of gas-only units were forced to take derates due to a lack of fuel during peak winter conditions.[14] Thus, New York has already experienced the impacts of increasingly tight gas supply conditions in winter months. In fact, New York's dual fuel fleet has often been cited as one of the main reasons that New York was less susceptible than the adjoining regions during the 2013–2014 winter to price spikes and was in a better position to manage core reliability concerns effectively.[15]

Nor is the need for dual fuel capability simply a polar vortex issue. As the NYISO's peak winter report for this past winter showed, even in years when New York has experienced a very mild winter overall, natural gas supply became stressed during the one limited stretch of cold temperatures.[16] In recognition of the increasing tightness of the gas system, which could result in more frequent gas curtailments in the future, the NYISO has been pursuing a project to

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[12] *See, e.g.*, Peter Carney, *CPP Study Plan: Phase I Status Report and Preliminary Findings*, NYISO (July 5, 2016), http://www nyiso.com/public/webdocs/markets_operations/committees/bic_espwg/meeting_materials/2016-07-05/NYISO%20CPP%20Study.pdf.

[13] *See, e.g.*, *New York State Department of Environment Conservation Denies Water Quality Certificate Required for Constitution Pipeline*, N.Y. State Dep't of Envtl. Conservation (Apr. 22, 2016), http://www.decny.gov/press/105941 html.

[14] Wes Yeomans & Kelli Joseph, *Winter 2013–2014 Cold Weather Operating Performance*, NYISO (Mar. 13, 2014), at 5–8, 11–12, 14–16, 18, http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_miwg/meeting_materials/2014-03-13/Winter%202013-1014%20NYISO%20Cold%20Snap%20Operations%20EGCW-MIWG.pdf.

[15] *Id*. at 22.

[16] *See* Wes Yeomans, *2015–2016 Winter Capacity Assessment & Winter Preparedness*, NYISO (Dec. 17, 2015), at 9, 16, http://www.nyiso.com/public/webdocs/markets_operations/committees/mc/meeting_materials/2015-12-17/Agenda%2005_Winter%202015_16%20Capacity%20%20Assessment_Winter%20Preparedness.pdf.

consider the development of new critical day performance rules.[17] This project has been included in the list of candidate projects for 2017.[18] These rules may potentially penalize generators that do not have dual fuel capability or firm gas transportation, which is likely to be much more costly than dual fuel capability and does not provide any scheduling benefits to peaking generators that are not likely to have been committed for full days prior to the Timely Nomination Cycle window closing. There would be no reason to develop these rules if all units were always able to obtain natural gas, especially during the operating day.

If the Board does not adopt dual fuel capability as a component of the proxy peaking unit in Zones C and F, or any other Zone in the State, it should direct the NYISO to modify the NYISO tariff to require that the net CONE of the proxy peaking unit and the associated reference prices be adjusted automatically. This adjustment should be made on the effective date of any performance rules that effectively require a dual fuel or firm gas requirement.

In addition, to the extent a proxy peaking unit is not dual fuel capable in the ROS, the Board should direct the NYISO to adjust the net Energy and Ancillary Services ("E&AS") model to accurately reflect that there will likely be days when the gas system will be congested and gas-only peaking units will be curtailed. Pursuant to Niagara Mohawk Power Corporation's Gas Transportation Service for Dual Fuel Electric Generators service classification, a generator's gas transportation service is subject to interruption up to 30 days per year.[19] Niagara Mohawk may

[17] *2017 Project Candidates*, NYISO (June 24, 2016), at 8, http://www.nyiso.com/public/webdocs/markets_operations/committees/mc_bpwg/meeting_materials/2016-06-24/2017%20Project%20Candidate%20Descriptions.pdf.

[18] *See* Ryan Smith, *2017 Project Prioritization & Budgeting Process*, NYISO (June 24, 2016), at 12, http://www.nyiso.com/public/webdocs/markets_operations/committees/mc_bpwg/meeting_materials/2016-06-24/2017%20Project%20Prioritization%20Process.pdf; Alan Ackerman, *NYISO 2017 Budget Overview*, NYISO (Sept. 28, 2016), at 6, http://www.nyiso.com/public/webdocs/markets_operations/committees/mc/meeting_materials/2016-09-28/Agenda%2006_2017%20Draft%20Budget.pdf.

[19] *See* Niagara Mohawk Power Corporation, PSC No. 219, Schedule for Gas Service, Leaf 221.

disconnect and cancel service to a customer that does not discontinue use when called to do so. Thus, if the proxy plant for the ROS is gas-only, the net E&AS revenues must be reduced to reflect that the peaking unit could be off-line up to 30 peak days of the year.

II. Staff Has Correctly Determined That the Proxy Peaking Unit for All Zones Should Be Equipped with SCR Technology.

IPPNY strongly supports Staff's final recommendation that the Siemens SGT6-5000F5 (F Class Frame) with SCR emission control technology represents the highest variable cost, lowest fixed cost peaking plant that is economically viable and practically constructible across all locations. For the reasons discussed in the Final Staff Report, the Consultants' final report and in the attached position paper of two leading permitting and air quality experts from the environmental consulting firm, Ecology and Environment, Inc. ("E&E"),[20] a developer would be very unlikely to be willing to construct an F Class Frame unit that was not equipped with SCR technology in any Load Zone in New York due to siting, permitting, and future market risks, and, thus, the cost of the technology must be included to ensure the proxy peaking unit for each zone is economically viable.

Addressing environmental requirements in the Final Staff Report, NYISO Staff establishes from the outset that the environmental regulatory framework has changed significantly since the 2013 reset process.[21] Following a comprehensive review of, and taking into consideration, all permit requirements, NYISO Staff concludes that emissions controls on the F Class Frame proxy peaking unit in all locations must include SCR technology, finding that,

[20] *See Position Paper*, E&E (Aug. 19, 2016) ("E&E Position Paper").

[21] *See* Final Staff Report at 9.

"due to the NOx emissions rates for all other technologies, SCR is required in order to comply with NSPS requirements for NOx."[22]

Some market participants claim that a proxy peaking plant without SCR in Zones C, F and G (Dutchess) could be permitted and constructed if the plant has an operating hour limit below the major source threshold pursuant to the U.S. Environmental Protection Agency's New Source Review ("NSR") regulations. Contrary to this claim, E&E demonstrates that "other factors in the air permit process drive the need to include an SCR for successful air permitting."[23] E&E explains that a proposed project without emissions control technology, such as SCR, would not meet the Article X requirement to minimize adverse environmental impacts.[24] Given that the Article 10 siting process provides for a mandatory public involvement process which is funded by the developer to ensure parties that wish to raise issues are able to do so,[25] it is almost certain that parties engaged in environmental issues will raise this issue. Importantly, the Siting Board is authorized to impose conditions more stringent than federal or state regulatory requirements.[26] Thus, it is highly likely that the Siting Board would condition the Article 10 application on the installation of SCR, or deny the application outright.

There is also a risk that a developer that does not install SCR technology at the time the plant is permitted will face costs to retrofit its facility at a later time that are significantly higher than the cost would have been to install it initially. In short, the decision to construct a facility anywhere in New York State without SCR technology introduces development risks and the

[22] *See id.* at 16.

[23] E&E Position Paper at 10.

[24] *Id.* at 9.

[25] *See id.*

[26] *Id.*

potential for significant additional future SCR retrofitting cost (relative to the cost of an SCR included in the original plant design). The developer would also face significant outages to install the equipment. These additional risks would need to be captured in the calculation either in the form of a significantly shorter amortization period than the 20-year period currently embedded in the Final Staff Report or an increased required return if the proxy peaking plant is not assumed to have SCR. Once the additional risks are appropriately represented, it is likely that the annualized cost of the uncontrolled unit would be no lower than the cost of a unit equipped with SCR technology from the outset.

The State's recent adoption of its CES, mandating that 50% of the energy consumed in the State by 2030 be generated by zero emission resources, manifests the State's strong commitment to achieve a 40% reduction in carbon emissions by 2030. Given this focus, it is hard to fathom that the State would permit a fossil-fueled facility without emissions control technology and undercut the carbon emission reductions it is otherwise securing through the CES program.[27]

An operating hour limit is also unlikely to avoid the need for SCR because a plant without SCR may have difficulty meeting the 1-hour nitrogen dioxide ("NO2") National Ambient Air Quality Standard ("NAAQS"). E&E states:

> Demonstrating compliance of conventional peaking units without SCR through modeling is difficult because of the statistical form and concentration value of the 1-hour NO2 NAAQS. Modeling of NOX emissions from relatively simple, minor emission sources often show noncompliance with the standard. Locating emission

[27] It bears note that, throughout the CES Proceeding, the Staff of the Department of Public Service ("DPS Staff") and the New York Public Service Commission ("NYPSC") itself established that the loss of significant existing zero-emission resources would be replaced by fossil-fueled facilities. NYPSC Case 15-E-0302, *Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard*, Order Adopting a Clean Energy Standard (Aug. 1, 2016), at 19. In light of this information, it strains credulity that the NYPSC in its capacity on the Siting Board would be willing to grant certificates to the next generation of fossil-fueled facilities without mandating that these facilities must control their emissions with SCR technology.

> sources close to property boundaries or fence lines and short exhaust stack heights can also contribute to a modeled NO2 NAAQS noncompliance. Using SCR to reduce the NOX emission rate may be necessary to model compliance with the 1-hour NO2 NAAQS.[28]

E&E has determined that, since 1990, every peaking unit permitted in New York, New Jersey, and Connecticut, with the exception of one project permitted in New Jersey in 2001, includes SCR technology.[29] E&E explains that the sole New Jersey project without SCR, which was developed by Consolidated Edison, includes a limit on its operation of 1,050 hours per year.[30] Back 15 years ago, the United States Environmental Protection Agency ("USEPA") disagreed with the New Jersey Department of Environmental Protection's issuance of the permit with a LAER emission limit of 9 ppm because it did not agree with New Jersey that the frequent start and shutdown events and the hot exhaust gas temperature made the application of SCR infeasible.[31] To satisfy the economic viability requirement set forth in the Services Tariff, the NYISO must demonstrate that a facility can be replicated in the relevant zone, not simply that one unit can be built on a one-off basis. Real-world experience thus supports continuing to recommend that the proxy peaking plants be equipped with SCR technology in all regions in the State.

As NYISO Staff correctly found in the Final Staff Report, the environmental regulatory framework is a significant factor in determining capital costs that must be accurately captured to ensure the proposed proxy unit is economically viable as mandated by the NYISO's Services

[28] E&E Position Paper at 5.

[29] *Id.* at 6–7.

[30] *Id.* at 8.

[31] *Id.*

Tariff.[32] Given the significant changes to this framework since the last reset process, it is critical that the Board uphold the Consultants' and NYISO Staff's final recommendations to equip proxy units in all locations with SCR technology when it directs the NYISO to file proposed Demand Curves with FERC in this reset process.

III. The Natural Gas Hubs Recommended by NYISO Staff and the Consultants Should Be Adopted without Modification.

To calculate net E&AS revenues, the NYISO must identify a natural gas hub to obtain representative gas pricing for each zone. To determine the natural gas hub for each zone that best represented the expected long-run equilibrium between gas and electricity markets, the Consultants developed a multi-pronged framework. The selection of natural gas hubs was the focal point of two presentations and was otherwise addressed a number of additional times at ICAP meetings. Relying on SNL Financial data that is based on actual price and volume data submitted by market participants for daily and forward transactions, the Consultants determined that the Iroquois 2 pipeline should be designated as the natural gas hub for Zone G. Upon review of the Consultants' Final Report and written comments submitted by Market Participants, including proposals to "weight" the Zone G natural gas hub, which would price gas in this zone based on the fiction of a combined pipeline gas price that would not be available to any facility operating in the Lower Hudson Valley, NYISO Staff endorsed the Consultants' recommendation.

The Services Tariff mandates that the proxy peaking unit be economically viable. While pricing on the various natural gas hubs may change over time, the SNL Financial data will reflect the pricing trends that are occurring in the markets, ensuring that the Iroquois 2 data will

[32] Final Staff Report at 6.

reasonably track and reflect gas pricing available to generating facilities in the Lower Hudson Valley. Moreover, the Consultants' multi-pronged framework included the critical component of examining how closely pricing on the various natural gas hubs aligned with Zone G LBMPs. This data clearly reflects that Iroquois 2 pipeline pricing tracks quite precisely with the Zone G LBMPs. When taken in combination with the fact that the Iroquois 2 pipeline is sufficiently traded and has a sufficient trading history, its designation as the Zone G natural gas hub is a reasonable result.

IV. The Assumed Property Tax Rate outside of New York City Should Reflect the Recent Pressures on Municipalities to Maximize Tax Revenues from New Gas-Fired Generators.

In the Final Staff Report, Staff agreed with the Consultants' recommendation that the assumed property tax rate for proxy peaking units outside of New York City should be 0.75%. The Consultants' recommendation was based on their review of 11 Payment in Lieu of Taxes ("PILOT") agreements for gas-fired plants in New York, a proposal that was already 0.08% less than the median effective tax rate.[33] As Staff noted, some market participants advocated for a reduced tax rate for peaking plants outside of New York City. Using the dataset developed by the Consultants, Staff found that "the effective tax rates for units that are more similarly situated to the peaking plant (*i.e.*, units outside NYC that are less than 300 MW) range from 0.25% to 2.01%, with a median value of 1%."[34] Staff found that the median value of the tax rates is 0.77% if the underlying capital expenditure of the units analyzed by the Consultants are adjusted to

[33] *Study to Establish New York Electricity Market ICAP Demand Curve Parameters*, Analysis Group, Inc. (Aug. 16, 2016), at 45–46, http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2016-08-19/Analysis%20Group%20NYISO%20DCR%20Final%20Report%20-%208_16_2016%20-%20Clean.pdf ("Final Consultant Report").

[34] Staff Final Report at 49.

2014 dollar terms.[35] Based on these results, Staff determined that the Consultants' 0.75% rate "is within the range of tax rates that a generator similar in size to the peaking plant would be likely to incur."[36]

A 0.75% tax rate is too low because it is based on PILOT agreements that were executed many years ago and therefore does not reflect the more recent pressures on municipalities to require higher tax rates from new gas-fired generators. There are two recent circumstances that are likely to pressure municipalities to require higher tax rates from gas-fired plants. The first circumstance is the change in public attitude regarding gas-fired generation. Opposition to gas-fired generation is much greater than it was only a few years ago. The change in attitude is demonstrated by the State's recent adoption of the Clean Energy Standard, which strongly discourages the development of any new non-renewable generation, and the significantly increased involvement of highly organized groups opposed to fossil fuels and fossil generation in the State. Groups opposed to hydraulic fracturing have been successful in blocking developments of new gas pipelines in New York.[37] Other groups opposed to new gas-fired generation being developed in New York have staged demonstrations blocking access to the construction site of gas-fired generation.[38] In the western part of the State, well-organized environmental groups opposed the conversion of a coal plant to natural gas firing in favor of transmission upgrades.[39] It is likely that developers of new gas-fired generation in New York

[35] *Id.*

[36] *Id.*

[37] *See, e.g.*, Scott Waldman, *Cuomo Administration Rejects Constitution Pipeline*, Politico (Apr. 22, 2016), http://www.politico.com/states/new-york/albany/story/2016/04/cuomo-administration-rejects-constitution-pipeline-101005.

[38] *See, e.g.*, Michael Randall, *Six Protesters Taken into Custody in Anti-CPV Power Plant Demonstration*, Times-Herald Record (Dec. 18, 2015), http://www.recordonline.com/article/20151218/NEWS/151219398.

[39] *See, e.g.*, NYPSC Case 12-E-0136, *Dunkirk Power, LLC*, Comments of Sierra Club, Earthjustice, and Pace Climate and Energy Center (Sept. 20, 2012).

will face significantly more local opposition than they have faced in the past and will be pressured into providing greater community benefits, in the form of higher PILOT payments, to facilitate the permitting process.

The second recent circumstance that is likely to influence municipalities to require higher tax rates for gas-fired plants is New York's real property tax cap, which prohibits local governments and school districts from raising taxes more than two percent or the rate of inflation per year, whichever is less, unless overridden by a local law or resolution approved by at least a 60% vote. The tax cap, which was enacted in 2011, has greatly reduced local governments' flexibility to raise taxes assessed to the general public and has stimulated local citizens to more closely monitor their elected officials with respect to tax matters. According to the Governor's report on the first year of the tax cap's operation, the cap "succeeded in curbing the average rate of property tax levy growth to 2 percent—less than 40 percent of the previous 10-year average" and it "increased voter participation and communication between school boards and the voters."[40] Local governments will likely be under a great deal of pressure to negotiate higher tax rates for new gas-fired generators to offset lost tax revenues due to the tax cap and to placate local citizens' demands to shift more of the tax burden to new, disfavored developments, such as gas-fired generators.

Summarily dismissing IPPNY's demonstration that changes in law and public policy would cause tax rates to increase, Staff asserted that just one PILOT agreement—the PILOT agreement negotiated by CPV Valley, LLC set at 0.18%—"demonstrates that the changes in law and policy since the last reset have not had an adverse impact on tax rates afforded to new fossil-

[40] *Reducing Property Taxes for New Yorkers: The New York State Property Tax Cap's Successful First Year*, N.Y. Governor's Office (Sept. 27, 2012), at 1, https://www.governor ny.gov/sites/governor.ny.gov/files/archive/assets/documents/CappingPropertyTaxReport.pdf.

fuel fired generators in New York."[41] As Staff itself acknowledged, "the CPV Valley facility is a large combined cycle facility that may not be directly comparable to a peaking plant."[42] Further, it is unreasonable to estimate future tax trends based on only one sample, as it may be anomalous. Thus, the 0.75% tax rate recommended by the Consultants should be raised, not lowered, as requested by some stakeholders.

V. The Board Should Adopt a Higher Cost of Debt for the Proxy Peaking Units Than Staff's and the Consultants' Recommendation to More Accurately Reflect the Risks That Developers Face.

The Consultants recommend a nominal after tax weighted average cost of capital ("ATWACC") of 8.60% in Zones outside of New York City and 8.36% in New York City. The Consultants state that their proposed ATWACC is slightly higher than the current ATWACC approved during the NYISO's 2013 Demand Curve reset process and in neighboring RTOs to reflect increased risk in the NYISO relative to its neighboring RTOs.[43] Two driving factors have changed since the last reset process that warrant a higher ATWACC. First, the NYISO is now projecting flat load growth for at least the next ten years.[44] Thus, the past ability for load growth to ameliorate deficiencies in past studies that inaccurately lowered the net CONE of the proxy peaking plants has disappeared. Second, the Consultants recognized that failing to account for Real Time Commitment ("RTC") pricing resulted in inflated net E&AS revenues but ultimately elected to retain Real Time Dispatch ("RTD")-based pricing. Issues were also acknowledged

[41] *See* Staff Final Report at 49.

[42] *Id*.; *see also id*. at 48 (pointing to the fact that "[t]he broader data set utilized by the Consultants demonstrates that tax rates for smaller plants, which may be more representative of a peaking plant, are typically higher that the rates negotiated by larger combined cycle plants," and determining that "the tax rate for the smaller megawatt size peaking unit may be higher than that historically available for combined cycle units").

[43] Final Consultant Report at 62.

[44] *See 2016 Load & Capacity Data*, NYISO (Apr. 2016), at 1, http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Planning_Data_and_Reference_Docs/Data_and_Reference_Docs/2016_Load__Capacity_Data_Report.pdf.

with the intra-day fuel premium that was utilized in the model (*e.g.*, its inability to accurately represent operational flow order conditions), but the Consultants ultimately determined that a measurably better approach had not been identified.[45] A higher ATWACC ameliorates the acknowledged shortcomings in fully addressing these two issues.

IPPNY agrees with the Consultants that a higher ATWACC is necessary to account for the lack of long-term contracts, uncertainty over changes in regional markets and energy policies, flat load growth, and more challenging siting and development opportunities in New York. The Consultants' proposed ATWACC needs to be increased, however, to more accurately reflect these risks and the other risk factors identified above that the Consultants' net E&AS model did not address adequately.

VI. The Board Should Adopt Staff's Recommendation that the Level of Excess Adjustment Be Based upon the Recent CARIS 2 Database without Any Adjustments to the Resource Mix.

Pursuant to the Services Tariff, the NYISO estimates net E&AS revenues for the proxy peaking units under conditions in which the available capacity in each capacity region is equal to the applicable minimum Installed Capacity requirement, plus the capacity of the applicable peaking plant. The Consultants advised Market Participants that it had performed the initial Level of Excess Adjustment Factor ("LOE-AF") estimates based on the CARIS Phase 1 database as a placeholder because CARIS Phase 2 had not been completed yet. The Consultants' final report generated LOE-AF utilizing using the 2016 CARIS Phase 2 database, which contains the

[45] IPPNY addressed the flaws in the Consultants' modeling with respect to the RTC/RTD pricing and intra-day fuel premium in its comments on the Consultants' draft report and incorporates such comments herein by reference. *See Comments on Proposed Installed Capacity Demand Curves*, IPPNY (July 8, 2016), http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2016-06-27/2016-07-08_IPPNY%20Comments%20on%20Draft%20DCR%20Report.pdf.

most recent resource addition and retirement assumptions and updated load and gas price forecasts.

At the ICAP working group meeting on July 19, 2016, the NYISO asked market participants which CARIS database should be used to determine the LOE-AF. Some market participants proposed that the CARIS Phase 2 database be further revised by assuming that the upstate nuclear units are retained in the database because the NYPSC issued an order on August 1, 2016 establishing the CES in New York that included a requirement for Load Serving Entities to purchase zero-emission credits from qualifying nuclear plants in New York.

In the Staff Final Report, Staff concludes that the LOE-AF values reflected by the CARIS 2 database without making any adjustments to the resource mix are appropriate for establishing the Demand Curve values because it satisfies the NYISO's inclusion rules by including the most recent information regarding unit status. Even if the CARIS 2 database were developed today, it would not include the FitzPatrick and Ginna nuclear units because they do not meet the inclusion rules. Since the NYPSC's August 1 CES Order, the owners of the Ginna and Fitzpatrick nuclear units have not provided an indication to the NYISO that would meet the requirements of the CARIS base case inclusion rules that they will return their units to service.[46] Proposals to add

[46] On September 30, 2016, Ginna submitted a conditional notice of its intent to continue commercial operations after the March 31, 2017 expiration of its Reliability Support Services Agreement with the NYPSC. Specifically, it reserved the right to withdraw its notice and terminate operations consistent with the Joint Proposal if: (i) the zero-emission credit ("ZEC") requirement established in the NYPSC's August 1, 2016 CES Order is modified in a manner adverse to Ginna, terminated, suspended, or stayed prior to the date that one or more ZEC agreements with the New York State Energy Research and Development Authority become effective; or (ii) "for any reason any one or more of Ginna, Nine Mile Point Nuclear Station, LLC, or Entergy Nuclear Fitzpatrick LLC fails to execute and deliver agreements with NYSERDA for the sale of ZECs in form and substance satisfactory to Ginna." Per the NYPSC's CES Order, the ZEC agreements will become effective on the later of April 1, 2017, or the date on which all contracts have been executed. The owner of FitzPatrick reported to the NYPSC that the continued operation of the unit is contingent on the sale of the unit, *inter alia*, being approved by the NYPSC, FERC and the Nuclear Regulatory Commission. No such approvals have been granted at this time and it is unlikely that all requisite approvals will be granted by November 30, 2016, the date that the NYISO must file the Demand Curve values with FERC. Thus, until the ZEC contracts have become effective and all of the approvals necessary to transfer FitzPatrick are obtained, Ginna's and FitzPatrick's continued operations are too speculative under the NYISO's base case inclusion rules to revise the CARIS 2 base case and include either of them.

these units back to the database would violate the NYISO inclusion rules and cannot be sanctioned.

The Board should not cave into pressure to deviate from the result of its inclusion rules. As the NYISO is well aware, the LOE adjustment is quite controversial when combined with the new rules that calculate net E&AS revenues based upon rolling historic prices. Substantial focus has been placed on enhancing accuracy and transparency in this reset process. Making the ad hoc adjustment to the LOE estimate process that some market participants have proposed only makes the LOE-AF more controversial and looks like the NYISO is trying to influence the results rather than holding to its defined rules, and, thus, marks a substantial step backward in producing more transparent Demand Cure reset process results.

Position Paper – Revised September 28, 2016
NYISO Demand Curve Reset Peaking Unit

Introduction

The New York Independent System Operator (NYISO) is currently preparing the Demand Curve Reset (DCR) study. As part of the study, electric generation peaking unit designs are being evaluated to serve potential peak power requirements. The peaking unit design study includes consideration of emission controls required to successfully obtain an air permit for a peaking unit in New York State. The Independent Power Producers of New York (IPPNY) requested that Ecology and Environment, Inc. (E & E) evaluate relevant aspects of the *Study to Establish New York Electricity Market ICAP Demand Curve Parameters (Values for the 2017/18 ICAP Demand Curves)* prepared by the Analysis Group ("Analysis Group Study") and provide an independent opinion on the control technology selection and ability to successfully permit peaking units in New York State.

E & E provides innovative, multidisciplinary solutions to complex environmental issues. Employing experts in 85 engineering and scientific disciplines, E & E has offices in 42 cities across the United States and in 17 locations around the globe. Beginning with the Trans-Alaska Pipeline project in the early 1970s, E & E has a long history of supporting complex energy projects representing the full array of emerging and evolving technologies. E & E has collectively worked on more than 200 energy projects in 34 states. Our resources, qualifications, and experience provide effective strategic consulting services to the energy industry. E & E's power generation permitting experience includes siting, permitting, and development of Natural Gas Combined-Cycle (NGCC), Simple Cycle Peakers ("peakers"), and syngas power (IGCC). We assist with every stage of planning and implementation, from the early stages of site selection through construction support, facility startup and operation, and post-construction monitoring and compliance. Two of E & E's permitting and air quality specialists, Ms. Janine Whitken and Mr. Bruce Wattle, performed the review of control technology selection and review of peaking units successfully permitted in New York State.

Ms. Whitken has 32 years' experience in shaping and implementing environmental standards and practices for government and industry. She has provided strategic planning and management of complex projects involving a wide range of technical and regulatory issues, successfully obtaining environmental approvals for numerous energy projects throughout the United States, and has developed pioneering solutions for impact mitigation and avoidance, emission offsets, and regulatory challenges. She also has provided expert witness testimony before the New York State Public Service Commission on environmental permitting and the power plant certification process. Ms. Whitken obtained her Bachelor of Engineering degree from Stevens Institute of Technology in Civil/Environmental Engineering.

Mr. Wattle has 36 years' experience in mobile, stationary, and fugitive source air emission projects; air quality regulatory compliance evaluations; preparation of air permit applications; and meteorological and dispersion modeling studies. He has written over 75 climate, air quality, and cumulative climate/air quality sections for environmental impact studies, prepared air permit applications and air dispersion modeling studies for energy projects throughout the United States. Mr. Wattle received his Bachelor of Science in Atmospheric Science from the University of Michigan.

Summary

The peaking unit proposed in the Analysis Group Study includes gas turbines with selective catalytic reduction (SCR) to reduce oxides of nitrogen (NO_X). It is the opinion of E & E's permit and air quality specialists that this peaking unit configuration is consistent with (1) meeting regulatory requirements designed to reduce emissions of NOx and reduce the formation of ozone in the Northeast, (2) a facility design more likely to successfully meet ambient air quality modeling demonstration requirements, and (3) similar units permitted recently in the Northeast. In addition, the New York State Article 10 process requires a project to minimize adverse environmental impacts and implement a rigorous public involvement process that may result in a Certificate with conditions at least equal to and potentially more stringent than federal or state regulatory requirements.

This opinion reflects the challenge of meeting ambient air quality standards, including the lowering of the ozone National Ambient Air Quality Standard (NAAQS) in 2015 and a new 1-hour nitrogen dioxide (NO_2) NAAQS in 2010. Other factors beyond the scope of this review may also affect the ability to obtain an air permit in New York State, such as site-specific conditions, community input, and other environmental impacts.

This document provides background information on the air quality regulations and conditions driving the need for NO_X emission controls and discusses recent permits issued in New York, New Jersey, and Connecticut for simple-cycle power generation facilities. The choice of the peaking unit emission controls is related to existing air quality conditions, control technology requirements dictated by air permitting regulations, and recent permits issued for similar facilities in New York and in the New York, New Jersey, Connecticut (NY-NJ-CT) Air Quality Control Region (AQCR).

I. Background air quality and air permitting requirements drive the need for post-combustion controls such as selective catalytic reduction (SCR).

A. Concentrations of ozone in New York City exceed federal and state air quality standards for ozone, and all of New York State is within the ozone transport region (OTR); thus, its precursor pollutants—nitrogen oxides and volatile organic compounds—are a key consideration for obtaining a permit for an emission source.

Ozone forms from the reaction of NO_2 (a component of NO_X) and volatile organic compounds (VOCs) in the presence of sunlight. In this context, NO_2 and VOCs are referred to as ozone precursor compounds. Combustion sources such as power plants emit NO_2 and VOCs from burning fuel.

Ozone has been regulated for several decades. The timeline for the ozone NAAQS is as follows:

- Established in 1979 as a 1-hour standard at 0.12 parts per million (ppm);
- Revised in 1997, changing from a 1-hour to 8-hour standard at 0.08 ppm;

- Revised in 2008, lowering to 0.075 ppm; and
- Revised in 2015, lowering to 0.070 ppm.

Ozone levels measured in the New York City metropolitan area exceed the 2008 NAAQS for ozone. Although measured ozone concentrations elsewhere in New York State are below the NAAQS, all of New York State is within an ozone transport region (OTR). Certain counties in New York State have not met previous ozone NAAQS, do not meet the current 2008 NAAQS, and may not meet the 2015 NAAQS. Areas that do not meet the ozone NAAQS are designated as "nonattainment."

The revisions to the ozone NAAQS since 1979 have made the standard more stringent, driving the need for greater control of ozone precursor compounds. In the New York City metropolitan area, ambient ozone concentrations exceeded the ozone standard dating back to the 1979 NAAQS. The area continued in nonattainment for the revised ozone standards in 1997 and 2008. Ambient ozone concentrations also exceeded the 1979 NAAQS in Essex County, Jefferson County, and the counties in the Buffalo-Niagara Falls area and Albany-Schenectady-Troy area. The 1997 revision brought additional upstate counties into nonattainment, including several counties in the Rochester area and Chautauqua County (Jamestown). The 2008 NAAQS lowered the concentration value of the standard, and all upstate New York counties except Chautauqua were shown as attaining the standard.

In 2017, the USEPA will officially issue attainment/nonattainment designations for the 2015 NAAQS based on 2014–2016 monitoring data. Preliminary monitoring data collected by the New York State Department of Environmental Conservation (NYSDEC) in 2012–2014 indicate that the following counties in New York State may be nonattainment (USEPA 2016a):

- In the New York City metropolitan area – Rockland, Westchester, Bronx, Queens, Richmond, and Suffolk; and
- Erie and Chautauqua.

Layered on top of the county-by-county assessment of compliance with the ozone NAAQS is regional control of ozone. In the Northeast, ozone is considered a regional issue; therefore, regulatory programs designed to control ozone are coordinated with multiple states within the region. To acknowledge the transport of ozone precursors and ozone in the Northeast and to accomplish regional control of ozone precursor compounds, the Ozone Transport Commission (OTC) coordinates the activity of member states. The OTC and OTR were established as part of the Clean Air Act of 1990. The OTR defines the area within which enhanced control of ozone precursors from emission sources is needed. The OTR is a multi-state area in the northeastern United States; all of New York State is in the OTR.

B. Emission sources in the OTR must meet the same stringent emission limits for areas designated nonattainment for ozone in order to obtain an air permit.

The U.S. Environmental Protection Agency's (USEPA's) New Source Review (NSR) regulations pursuant to the Clean Air Act require a company planning to build a new plant that will result in air pollutant emissions that meet or exceed the major source threshold amount to obtain an NSR permit. The NSR permit is a construction permit that requires the company to minimize air pollution emissions to meet emission levels of facilities of similar type and size. This is usually accomplished by installing air pollution control equipment.

In nonattainment areas, the NSR rules require installation of the most stringent level of control or Lowest Achievable Emission Rate (LAER). Emission sources in the OTR are required to essentially meet the same limits (LAER) as if the area were designated nonattainment.

Table 1 shows the major emission source size definition for air permitting purposes with respect to location in ozone attainment/nonattainment areas and the OTR. The annual emissions from an emission source reflect its "potential to emit" defined as:

> "The maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of fuel combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable". (40 CFR Sections 52.21(b) (4))

Therefore, whether a source is above or below the ozone related major source thresholds reflects use of emission controls, hours of operation, and fuel use. A source may use any combination of these to stay below the major source threshold, if desired. After design limits for emissions, a source may decrease annual emissions by limiting hours of operation and avoid the associated emission control requirements.

Table 1 New York State Locations and Ozone-Related Major Source Thresholds

Location	Load Zone	Ozone Status	NO_X Major Source (tons per year)	VOC Major Source (tons per year)
New York City Metropolitan Area and portions of Orange County	Part of G, all of H, I, J, K	Moderate Nonattainment[1]	25	25
Rest of State	A through F and part of G	Ozone Transport Region	100	50

[1] Nonattainment designations for the 2008 NAAQS include Extreme, Severe, Serious, Moderate, and Marginal, depending on the ambient ozone concentrations. Although the New York City Metropolitan Area and portions of Orange County are designated moderate ozone nonattainment for the 2008 NAAQS (https://www3.epa.gov/airquality/greenbook/hnca html#Ozone_8-hr.2008.New_York), NYSDEC continues to regulate the New York City Metropolitan area with major source thresholds comparable to a severe ozone nonattainment area to prevent "backsliding," previous gains in attaining the previous 1-hour ozone NAAQS.

To reflect a recently permitted Siemens SGT6 5000F unit in New York State, we reviewed the CPV Valley Energy Center Draft Environmental Impact Statement and Air Permit Application (CPV Valley Energy 2009). Table 2 illustrates the relationship between potential to emit, hours of operation, and use of SCR on a Siemens SGT6 5000F. As shown in Table 2, the SGT6 5000F unit could operate a full year when firing natural gas and operating at the SCR controlled NO_x emission rate. Based on an estimated NO_X control level from SCR of 80% to estimate uncontrolled NO_X emission rates, we estimated the hours of operation on natural gas and oil without SCR. As shown in Table 2, the proposed unit could operate 2,633 hours when firing exclusively natural gas and 872 hours when firing exclusively ultra-low sulfur distillate fuel and stay below the major source threshold and the requirement for SCR.

Table 2 Estimated Annual NO_X Potential to Emit (PTE) With and Without SCR Compared to Major Source Thresholds[1]

Fuel	Emission Control	Operating Hours	NO_X PTE (tons per year)	Exceeds NO_X Major Source Threshold
Natural Gas	With SCR	8,760	66	No
	Without SCR	2,633	99	No
Distillate Oil	With SCR	4,358	99	No
	Without SCR	872	99	No

[1] Based on the recently permitted CPV Valley Energy Project Draft Environmental Impact Statement, Appendix 9-B, and assuming 80% reduction in NO_X emissions with SCR.

The operating hours on natural gas without SCR we calculated is similar to the Analysis Group Study estimate of "approximately 2,500 hours" (AG 2016). We also concur with the Analysis Group Study conclusion that the SGT6 5000F unit with SCR could operate for a full year when firing natural gas and remain below the major source threshold.

C. In addition, SCR may be necessary to demonstrate compliance with the 1-hour NO_2 NAAQS adopted in 2010.

Ambient air quality modeling required as part of the air permitting process also drives emission control requirements. The air quality modeling must show compliance with all NAAQS. Typically for power generation facilities, the 1-hour NO_2 NAAQS can be problematic.

Demonstrating compliance of conventional peaking units without SCR through modeling is difficult because of the statistical form and concentration value of the 1-hour NO_2 NAAQS. Modeling of NO_X emissions from relatively simple, minor emission sources often show noncompliance with the standard. Locating emission sources close to property boundaries or fence lines and short exhaust stack heights can also contribute to a modeled NO_2 NAAQS noncompliance. Using SCR to reduce the NO_X emission rate may be necessary to model compliance with the 1-hour NO_2 NAAQS.

II. Permits issued for projects in New York similar to the Analysis Group Study peaking unit in both a dual-fuel and natural gas only configuration incorporate SCR.

A. The USEPA and New York State Department of Environmental Conservation (NYSDEC) databases on permits issued for emission sources identify the types of controls and key data pertinent to design and operation.

The USEPA maintains a database of specific information provided by state and local permitting agencies on the Reasonably Available Control Technology (RACT), Best Available Control Technology (BACT), and Lowest Achievable Emission Rate technologies required to reduce the emission of air pollutants from stationary sources, including power plants. The USEPA established the RACT /BACT /LAER Clearinghouse (RBLC) to provide a central database of air pollution technology information to promote the sharing of information among permitting agencies and to aid in future case-by-case determinations (USEPA 2016b). LAER is required on major new or modified sources in nonattainment areas. As discussed above, the OTR, of which New York State is a part, is treated as an ozone nonattainment area.

Data in the RBLC includes sources subject to RACT, BACT, and LAER requirements. The RBLC permit database contains over 5,000 determinations of permitted technologies to mitigate most air pollutant emission streams (USEPA 2016).

The NYSDEC database of facilities that emit contaminants to the air in New York State includes facilities required to obtain a Title V permit, a state facility permit, or a registration certificate. The NYSDEC website posting of permits is intended to enable interested parties to view and print the language of draft and issued Title V facility permits (NYSDEC 2016).

Table 3 summarizes key information on turbines used for peak generation in the NY-NJ-CT AQCR. The results of the search were limited to facilities permitted after 1990 to reflect historical and current trends in emission control technology. Although these databases do not include every permitted power generating facility, they provide a reliable insight into the regulatory process for determining required emission controls and the most likely emission control requirements.

Table 3 Selected Turbines Identified from the USEPA RBLC and NY-NJ-CT AQCR Permit Databases that Have Been Permitted Since 1990[1]

Facility Name and Location	State	Zone	Turbines	SCR for NO_x Control
Allegany Alliance NYGT, LLC Allegany County	NY	B	GE LM6000 plus HRSG	YES
Ravenswood Generating Station Queens	NY	J	GE 7FA (peaking)	YES
Edgewood Energy LLC Suffolk County	NY	K	GE LM6000	YES

Table 3 Selected Turbines Identified from the USEPA RBLC and NY-NJ-CT AQCR Permit Databases that Have Been Permitted Since 1990[1]

Facility Name and Location	State	Zone	Turbines	SCR for NO_X Control
Equus Freeport Power Nassau County	NY	K	GE LM6000	YES
Glenwood Landing Nassau County	NY	K	GE LM6000	YES
Harlem River Yards Plant Bronx	NY	J	GE LM6000	YES
Hell Gate Bronx	NY	J	GE LM6000	YES
Vernon Boulevard Plant Queens	NY	J	GE LM6000	YES
Pouch Terminal Staten Island	NY	J	GE LM6000	YES
N 1st Street Plant Brooklyn	NY	J	GE LM6000	YES
NYPA Joseph J Seymour Brooklyn	NY	J	GE LM6000	YES
Consolidated Edison Development (Ocean Peaking Power)[2] Lakewood	NJ	NA	GE 7FA	NO
Bayonne Energy Center Hudson	NJ	NA	Rolls Royce Trent 60WLE	YES
PSEG Fossil LLC Kearny Station Hudson	NJ	NA	GE LM6000	YES
Howard Down Station Cumberland	NJ	NA	Rolls Royce Trent 60WLE	YES
PPL Wallingford Energy New Haven	CT	NA	GE LM6000	YES
PSEG Power Connecticut, LLC[3] (New Haven Harbor) New Haven	CT	NA	GE LM6000	YES

[1] Although these databases do not include every permitted power generating facility, they provide a reliable insight into the regulatory process for determining required emission controls and the most likely emission control requirements.
[2] Title V Permit Modification Facility PI No 78896 Activity No BOP010001 and permit issued October 2002.
[3] The PSEG Power Connecticut New Haven Peaking project was not listed in the USEPA RBLC but is included here for completeness.

B. In New York State, permits issued include SCR for NO_X control.

As shown in Table 3, all peaking units identified in the database searches and permitted in New York since 1990 include SCR for NO_X control. This includes frame and aero-derivative turbines. Although LAER is by definition an emission rate, it is achieved in practice by selected

control technologies. As the achievable emission rate decreases due to advances in design and operation of technology, only SCR can achieve the LAER of 2 to 3 ppm for simple and combined-cycle gas turbines, which is reflected in recent permits.

C. Results of the search for the NY-NJ-CT AQCR of the Ozone Transport Region identified SCR as the predominant method of NO_X control on peaking units.

As shown in Table 3 for New Jersey and Connecticut, peaking units, except one in New Jersey, include SCR for NO_X control. This includes frame and aero-derivative turbines.

The Consolidated Edison Development project in Lakewood, New Jersey, also known as Ocean Peaking, is the exception and includes dry-low NO_X control and a limit on operation of 1,050 hours per year. The New Jersey Department of Environmental Protection issued the permit with a LAER emission limit of 9 ppm, although USEPA disagreed with this determination. USEPA disagreed that the frequent start and shutdown events and the hot exhaust gas temperature made the application of SCR infeasible (USEPA 2001). The peaking facilities identified in Table 3 permitted after Consolidated Edison Development/Ocean Peaking include SCR for NO_X control.

III. USEPA Greenhouse gas limits affect the choice of fuel and use of distillate oil.

The USEPA finalized the "Standards of Performance for Greenhouse Gas Emissions from New, Modified and Reconstructed Stationary Sources: Electric Utility Generating Units" on October 23, 2015. The standard for non-base-load natural gas-fired combustion turbines is a heat-input-based standard set at an average of 120 pounds (lb) of carbon dioxide (CO_2) per million British thermal units (MMBtu) combined with the use of clean fuels as the best system of emission reduction (BSER). Clean fuels are defined as natural gas with a small allowance for distillate oil. The USEPA states this standard will apply to the "vast majority" of simple-cycle combustion turbines, or peaking units.

In determining this standard, the USEPA stated that this standard is readily achievable using "business-as-usual" fuels. The USEPA based this conclusion on (a) a natural gas emission rate of 117 lb CO_2/MMBtu, (b) use of distillate oil (the most common backup fuel) at an emission rate of 163 lb CO_2/MMBtu, and (c) the fact that a non-base-load turbine burning 9 percent distillate oil and 91 percent natural gas has an emission rate of 121 lb CO_2/MMBtu, which the USEPA stated, "rounds to 120 lb/MMBtu using two significant digits." The "small allowance for distillate oil" equates to 9 percent (Federal Register 2015).

Thus, the standard of performance for greenhouse gas emissions defines the type of fuel mix that is expected to result in compliance with GHG standards in a simple-cycle combustion turbine.

IV. The New York State Article 10 process requires a project to minimize adverse environmental impacts and implement rigorous public involvement that may result in a Certificate with conditions at least equal to and potentially more stringent than federal or state regulatory requirements.

Any new electric generating facility that will generate 25 MW or more is subject to Article 10 and must obtain a Certificate of Environmental Compatibility and Public Need. The Article 10 Certificate is issued by the New York State Board on Electric Generation Siting and the Environment (the "Siting Board"). The Siting Board is comprised of the heads of five state agencies (Department of Public Service, Department of Environmental Conservation, Department of Health, Energy Research and Development Agency, and Empire State Development) and two citizens from the locale of a proposed project appointed to the Siting Board by the Governor. In addition to verifying compliance with laws and regulations, the Siting Board, in order to issue an Article 10 Certificate, must find, among other requirements, that the project:

> Minimizes adverse environmental impacts, considering the state of available technology, the nature and economics of reasonable alternatives as are required to be considered, the interests of the State with respect to aesthetics, preservation of historic sites, forests and parks, fish and wildlife and other pertinent considerations.

The Siting Board is also responsible for overseeing the public decision making process that consists of a required public participation program, the opportunity for public statements and comment, and a trial-type hearing process in which qualifying municipalities and citizens can participate using funds provided by an Applicant. The Article 10 process allows for significant public involvement, as well as consideration of factors other than minimum regulatory requirements.

In addition, the Article 10 process relies on input from NYSDEC with respect to required federal or state air permits. The NYSDEC reviews a proposed generating facility design with regard to applicable emission regulations, emission limits, control technology requirements, and ambient air quality standards. Thus, a proposed unit that does not include control technology required by the air permitting process, such as SCR, would not meet the Article 10 requirement to comply with laws and regulations and the requirement to minimize adverse environmental impacts. Similarly, the combination of site-specific factors, public involvement, and a desire to minimize adverse impacts may result in a Certificate with conditions more stringent than federal or state regulatory requirements and may include control technology beyond minimum regulatory requirements.

V. The recent update to the Cross State Air Pollution Rule (CSAPR) requires further NOx reductions beginning May 2017 by reducing available allowances, which also influences the decision to install SCR.

The air quality goal of CSAPR is to reduce summertime emissions of NOx that contribute to ozone formation in the 22 CSAPR states (USEPA 2016c). A reduction in summertime NOx emissions under CSAPR will also contribute to reducing summertime ozone formation in the northeast ozone transport region (NOTR). Peaking units would likely run during the summer to meet peak load demand, and SCR provides the summertime NOx reduction necessary to contribute to meeting the goal of CSAPR. Due to the need to reduce NOx, CSAPR reinforces the need for SCR for the proxy peaking plant.

CSAPR is also a market-based and allowance-based program. Beginning in May 2017, CSAPR reduces the quantity of summertime NOx allowances available (USEPA 2016c). A tighter allowance market will likely increase allowance prices. Although cost of compliance with CSAPR would be the primary driver for evaluating whether to install SCR, we believe CSAPR would add to the reasons for installing SCR.

VI. Conclusion

Based on the information examined for this analysis, it is the opinion of E & E's air quality specialists that control of NO_X emissions with SCR is required in New York State in order to (1) address ozone NAAQS nonattainment in the New York City Metropolitan Area and the requirement for NO_X control in New York State as part of the OTR and (2) comply with federal and state requirements under the Clean Air Act. This level of NO_X control also contributes to the successful modeling demonstration of compliance with the 1-hour NO_2 NAAQS. In our opinion, the peaking unit design described in the Analysis Group Study that includes use of SCR for NO_X control addresses both of these requirements, complies with the letter and spirit of Article 10 and contributes to the air quality goals of CSAPR. This design is also consistent with recently permitted units in New York, New Jersey, and Connecticut.

Although an operating hour limit of approximately 2,500 hours would cap emissions from the peaking unit design described in the Analysis Group Study below the major source threshold, other factors in the air permit process drive the need to include an SCR for successful air permitting. The Analysis Group Study acknowledges that a project without SCR may receive significant local and environmental opposition, and heightens risk and costs of the future need to install SCR to meet future NOx control requirements (AG 2016). Based on our experience, the local and environmental opposition can be significant for a unit that does not propose installation of controls considered meeting BACT or LAER control requirements, particularly given the mandatory public involvement in the Article 10 process. Modeling compliance with the 1-hour nitrogen dioxide NAAQS may also require additional stack height, property acquisition and other considerations in order to model NAAQS compliance. Therefore we concur with the conclusions in the Analysis Group Study that SCR should be incorporated into the initial design.

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