UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc.	**)**	**Docket No. ER17-386-000**

REQUEST FOR LEAVE TO ANSWER AND ANSWER OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.

Pursuant to Rules 212 and 213 of the Rules of Practice and Procedure promulgated by the Federal Energy Regulatory Commission ("Commission"), 18 C.F.R. §§ 385.212 and 385.213, the New York Independent System Operator, Inc. ("NYISO") hereby submits this Request for Leave to Answer and Answer in response to certain protests and comments filed in response to the NYISO's proposal submitted in this proceeding on November 18, 2016 ("2016 DCR Filing").[1] The following parties filed protests and comments in response to the 2016 DCR Filing: (i) Consolidated Edison Company of New York, Inc. ("Con Edison") and Orange and Rockland Utilities, Inc. ("Orange and Rockland");[2] (ii) Entergy Nuclear Power Marketing, LLC;[3] (iii) Independent Power Producers of New York, Inc. ("IPPNY");[4] (iv) Multiple Intervenors and the City of New York;[5] (v) Niagara Mohawk Power Corporation d/b/a National

[1] Docket No. ER17-386-000, *New York Independent System Operator, Inc.*, Proposed ICAP Demand Curves for the 2017/2018 Capability Year and Parameters for Annual Updates for Capability Years 2018/2019, 2019/2020 and 2020/2021 (November 18, 2016).

[2] Docket No. ER17-386-000, *supra*, Comments of Consolidated Edison Co. of New York, Inc. and Orange and Rockland Utilities, Inc. (December 9, 2016) ("Con Edison Comments").

[3] Docket No. ER17-386-000, *supra*, Motion to Intervene and Comments of Entergy Nuclear Power Marketing, LLC (December 9, 2016).

[4] Docket No. ER17-386-000, *supra*, Limited Protest and Comments of Independent Power Producers of New York, Inc. (December 9, 2016) ("IPPNY Limited Protest").

[5] Docket No. ER17-386-000, *supra*, Motion to Intervene, Comments and Protest of the City of New York and Multiple Intervenors (December 9, 2016) ("MI/City Protest").

Grid ("National Grid");[6] (vi) the New York State Department of State Utility Intervention Unit ("UIU");[7] (vii) the New York State Public Service Commission ("NYSPSC") and the New York State Energy Research and Development Authority ("NYSERDA");[8] (viii) the New York Transmission Owners;[9] and (ix) Potomac Economics, Ltd. ("Potomac Economics"), the NYISO's Market Monitoring Unit ("MMU").[10]

Representing the culmination of the more than year long periodic review process (commonly referred to as the "ICAP Demand Curve reset" or "DCR" process) required by the Market Administration and Control Area Services Tariff ("Services Tariff"), the 2016 DCR Filing proposes to establish the parameters of the ICAP Demand Curves for the 2017/2018 Capability Year.[11] The 2016 DCR Filing also proposes the methodologies and inputs that will be used in conducting the tariff-required annual updates to determine the ICAP Demand Curves for the 2018/2019 through 2020/2021 Capability Years.

[6] Docket No. ER17-386-000, *supra*, Comments of Niagara Mohawk Power Corporation d/b/a National Grid (December 9, 2016) ("National Grid Comments").

[7] Docket No. ER17-386-000, *supra*, Motion to Intervene, Comments, and Protest of the New York State Utility Intervention Unit (December 9, 2016) ("UIU Protest").

[8] Docket No. ER17-386-000, *supra*, Notice of Intervention and Protest of the New York State Public Service Commission and New York State Energy Research and Development Authority (December 9, 2016) ("NYSPSC/NYSERDA Protest").

[9] Docket No. ER17-386-000, *supra*, Motion to Intervene and Protest of the New York Transmission Owners (December 9, 2016) ("NYTO Protest"). The New York Transmission Owners are comprised of: (i) Central Hudson Gas & Electric Corporation; (ii) Con Edison; (iii) National Grid; (iv) New York Power Authority; (v) New York State Electric & Gas Corporation; (vi) Orange and Rockland; (vii) Power Supply Long Island; and (viii) Rochester Gas and Electric Corporation.

[10] Docket No. ER17-386-000, *supra*, Motion to Intervene and Comments of the Market Monitoring Unit on the New York ISO's ICAP Demand Curve Reset (December 9, 2016) ("MMU Comments").

[11] Capitalized terms not otherwise defined herein shall have the meaning specified in the Services Tariff and the NYISO Open Access Transmission Tariff ("OATT").

The NYISO's proposal is designed to ensure that the ICAP Demand Curves fulfill their fundamental objective of attracting new and retaining existing capacity supply necessary to achieve New York's statewide and locational minimum Installed Capacity requirements. The NYISO's proposal also represents a reasonable balance between the divergent interests of the opposing parties.

Although parties do not agree with all aspects of the NYISO's proposal, the 2016 DCR Filing, together with the supplemental information provided herein, demonstrate that the proposal is just and reasonable. Accordingly, the NYISO respectfully reiterates its request: (i) that the Commission issue an order on or before January 17, 2017 accepting the ICAP Demand Curves proposed by the NYISO for the 2017/2018 Capability Year, as well as the NYISO's proposed methodologies and inputs for conducting the annual updates to establish the ICAP Demand Curves for the 2018/2019 through 2020/2021 Capability Years; and (ii) for an effective date of January 17, 2017 for the proposed revisions to Section 5.14.1.2 of the Services Tariff to reflect the parameters of the ICAP Demand Curves for the 2017/2018 Capability Year.

I. REQUEST FOR LEAVE TO ANSWER

Rule 213 of the Commission's Rules of Practice and Procedure generally prohibits answers to certain pleadings, including protests.[12] The Commission, however, has discretion to waive such prohibition.[13] The Commission has previously determined that a waiver is appropriate in circumstances where an otherwise prohibited answer: (a) will lead to a more accurate and complete record; (b) helps the Commission understand the issues; (c) clarifies

[12] *See* 18 C.F.R. § 385.213(a)(2). The Commission's Rules of Practice and Procedure authorize answers to pleadings stylized as "comments," such as the Con Edison Comments, National Grid Comments and MMU Comments.

[13] *Id.*

matters in dispute or errors; or (d) provides information that will assist the Commission in rendering a decision.[14] This answer clarifies matters in dispute, provides additional information that will assist the Commission, and will otherwise be helpful in the development of a complete record in this proceeding. Accordingly, the Commission should accept this answer.

II. ANSWER

The positions of various parties, if adopted, would result in either placing downward or upward pressure on the ICAP Demand Curve reference point values proposed by the NYISO. Although consensus among divergent interests was ultimately not achieved with respect to all aspects of the DCR, the NYISO's proposal strikes a fair and reasonable balance between these divergent positions.[15] The NYISO's proposal results in establishing ICAP Demand Curves that are designed to provide appropriate price signals as to the locational value of capacity based on the state's applicable minimum Installed Capacity requirements.

A. Peaking Unit Technology and Design

The 2016 DCR Filing proposes to maintain nearly the same peaking unit technology and plant design for all the ICAP Demand Curves as was approved by the Commission in the last reset.[16] For the Long Island ("LI"), New York City ("NYC") and G-J Locality ICAP Demand Curves, the NYISO proposes the continued use of a simple cycle, dual fuel F class frame turbine equipped with selective catalytic reduction ("SCR") emissions controls. For the NYCA ICAP

[14] *See, e.g., New York Independent System Operator, Inc.*, 99 FERC ¶ 61,246 (2002) (accepting answers to protests that helped to clarify issues and did not disrupt the proceeding); *Morgan Stanley Capital Group, Inc. v. New York Independent System Operator, Inc.*, 93 FERC ¶ 61,017 (2000) (accepting an answer that was helpful in the development of the record); and *New York Independent System Operator, Inc.*, 91 FERC ¶ 61,218 (2000) (accepting an answer deemed useful in addressing issues arising in the proceeding at issue).

[15] *Supplemental Affidavit of Paul J. Hibbard, Dr. Todd Schatzki, and Craig Aubuchon*, attached hereto as Attachment I, at ¶ 3-6 ("Supplemental AG Affidavit").

[16] 2016 DCR Filing at 6-22.

Demand Curve, the NYISO proposes continued use of a simple cycle, gas-only F class frame turbine. Due to changes in the applicable environmental requirements since the last reset, however, the NYISO now proposes that the NYCA ICAP Demand Curve peaking plant include SCR emissions controls.

1. The H Class Frame Turbine Is Not a Viable Candidate Technology for this DCR

In response to requests during the DCR process, the NYISO and the independent consultant engaged for this DCR ("Independent Consultant")[17] assessed the viability of a simple cycle H class frame turbine to serve as the peaking unit technology in New York for this DCR.[18] Due to the absence of any H class frame turbine currently operating in a simple cycle configuration with SCR emissions controls,[19] this technology is not economically viable, as required by the Services Tariff. As such, it does not qualify as a viable peaking unit technology at this time.

The UIU Protest contends that the H class frame turbine should serve as the peaking unit technology for the NYCA and G-J Locality ICAP Demand Curves.[20] To support its position, the UIU points to recent events in ISO New England, Inc. ("ISO-NE").[21]

These factors were fully considered by the NYISO and the Independent Consultant in determining that, for this DCR, the simple cycle H class frame turbine does not qualify as

[17] Analysis Group, Inc. ("AG"), together with Lummus Consultants International, Inc. ("Lummus"), was selected to serve as the tariff-required independent consultant for this DCR. AG, together with Lummus, is referred to herein as the "Independent Consultant."

[18] 2016 DCR Filing at 7-9.

[19] The applicable New Source Performance Standards ("NSPS") requirements mandate the inclusion of SCR emissions controls for a H class frame turbine regardless of location or whether the plant is gas-only or dual fuel. (2016 DCR Filing at 10.)

[20] UIU Protest at 4-7.

[21] *Id.*

economically viable, as required by the Services Tariff. Although the NYISO and the Independent Consultant fully considered the ongoing events in the ISO-NE capacity market related to the simple cycle H class frame turbine, these circumstances do not overcome or otherwise satisfy the economic viability requirement of the Services Tariff.[22] The ICAP Demand Curves have never been established using a technology design that is without any actual commercial operating experience.[23] The simple fact remains that the H class frame turbine has not, to date, operated commercially in a simple cycle configuration with SCR emissions controls. Therefore, it currently does not qualify for consideration as a viable peaking unit technology.

Until such time as a simple cycle H class frame turbine with SCR emissions controls achieves sufficient commercial operating experience to demonstrate that the technology is proven and reliable, its consideration as a peaking unit technology in New York remains premature. Accordingly, the Commission should approve the NYISO's proposal to continue use of a simple cycle F class frame turbine as the appropriate peaking unit technology for this DCR.

2. Changes in the Applicable Environmental Requirements Now Dictate Inclusion of SCR Emissions Controls for the NYCA ICAP Demand Curve Peaking Plant

The proposal to include SCR emissions controls in the peaking plant design for the NYCA ICAP Demand Curve represents a material change from the last reset. This change, however, is driven by the underlying changes in the applicable environmental requirements that have occurred since the last reset.[24]

[22] 2016 DCR Filing at 7-9.

[23] *Id*.

[24] *Id*. at 9-15.

Certain parties contend that the NYISO's proposal is based upon speculation and conjecture about future environmental requirements.[25] Accordingly, these parties request that the Commission reject the NYISO's position and, instead, allow for continued reliance on an annual operating hours limitation for the NYCA ICAP Demand Curve peaking plant to achieve compliance with the applicable nitrogen oxides ("NOx") emissions requirements.[26]

Contrary to the assertions of these parties, the assessment undertaken by the NYISO and the Independent Consultant is not based upon speculation as to future environmental requirements. The NYISO and the Independent Consultant considered the currently applicable environmental regulatory framework in determining that these requirements, as changed since the last reset, now dictate that the NYCA ICAP Demand Curve peaking plant design include SCR emissions controls.[27]

The changes in the applicable environmental requirements since the last reset now result in an uncontrolled unit subject to an annual operating hours limitation producing 2.5 times more NOx emissions on an annual potential to emit basis than a unit that includes SCR emissions controls.[28] This presents a material risk to the ability of an uncontrolled unit to obtain the necessary approvals to operate in New York, including obtaining a certificate from the New

[25] NYSPSC/NYSERDA Protest at 30-34; MI/City Protest at 21-35; UIU Protest at 7-9; and National Grid Comments at 4-8.

[26] *Id*.

[27] 2016 DCR Filing at 10-15.

[28] *Id*. at 12-14. Contrary to the allegations in the NYSPSC/NYSERDA Protest, NYISO staff and the Independent Consultant did discuss the alternative approach of an operating hours cap in lieu of installing SCR emissions controls with the New York State Department of Environmental Conservation. (NYSPSC/NYSERDA Protest at 17.) The parties discussed that this approach had been applied in the last reset for the NYCA ICAP Demand Curve peaking plant and it was confirmed that this alternative remained available under the applicable regulations and, therefore, would be reevaluated by the NYISO and the Independent Consultant during this DCR. The parties also discussed changes in the applicable environmental requirements since the last reset. (2016 DCR Filing at 4.)

York State Board on Electric Generation Siting ("Siting Board") pursuant to Article 10 of the New York Public Service Law ("PSL").[29] This risk, coupled with the continued tightening of NOx emissions restrictions for electric generators in New York, undermines the continued viability of relying on an annual operating hours limitation in lieu of installing SCR emissions controls.[30]

Certain opposing parties also contend that the Siting Board is either without authority to rule in a manner that is inconsistent with any draft permits that may be issued to a proposed project by the New York State Department of Environmental Conservation ("NYSDEC") and/or that the Siting Authority will always defer to the NYSDEC with respect to determinations regarding emissions requirements and mitigation of adverse emissions.[31] To support their position, these parties cite to certain precedent from the Siting Board.[32] These cases, however, were issued under the predecessor to the current Article 10 statute and may no longer be relevant to determinations of the Siting Board under the current regulatory paradigm. Unlike its predecessor, the new Article 10 statute that was enacted in 2011 provides the Siting Board with

[29] 2016 DCR Filing at 12-14. To issue a certificate under Article 10, the Siting Board must determine that "the adverse environmental effects of the construction and operation of the facility will be minimized or avoided to the maximum extent practicable." (PSL § 168(3)(c).)

[30] *Id*. at 14-15. Certain parties contend that the additional environmental regulations cited by the NYISO may not be applicable to the emissions requirements of a peaking plant in Load Zones C, F and G (Dutchess County). (NYSPSC/NYSERDA Protest at 27-29; and MI/City Protest at 31-35.) The NYISO clearly noted that the examples cited demonstrate the general trend of ever more stringent NOx emissions requirements in New York for electric generation facilities. This regulatory environment coupled with the material risk that a new gas fired generator, such as a peaking plant, may be unable to obtain the necessary permits and approvals for construction and operation in New York absent the installation of backend control technology demonstrates the need for the peaking plant to include SCR emissions controls in all locations regardless of whether the facility is gas-only or dual fuel. (2016 DCR Filing at 14-15.)

[31] NYSPSC/NYSERDA Protest at 30-34; and MI/City Protest at 24-31.

[32] NYSPSC/NYSERDA Protest at 31-34; and MI/City Protest at 29-30.

additional authority to act irrespective of any draft permits and conditions relating thereto that may be issued by the NYSDEC.[33] This new authority expressly provides that:

> issuance by the department of environmental conservation of [air and other required] permits shall in no way interfere with the required review by the [Siting Board] of the anticipated environmental and health impacts relating to construction and operation of the facility as proposed, **or its authority to deny an application for certification** ….[34]

This new, independent authority clearly authorizes the Siting Board to depart from the findings of the NYSDEC and potentially require more stringent emissions controls, if necessary, or simply deny an application, thereby preventing construction of a facility. Proceedings under the predecessor statute that did not expressly provide such authority to the Siting Board may no longer be relevant or representative of the actions that may be taken by the Siting Board under the current Article 10 process.

The NYSPSC/NYSERDA Protest also cites to certain facilities constructed in New York without SCR emissions controls to support their claim that the NYISO's proposal is unwarranted.[35] The facilities referenced, however, are irrelevant to the current conditions faced by a new peaking plant development in New York. The Danskammer facility commenced commercial operations in 1951 and was recently converted from primarily operating on coal to using natural gas as its primary fuel source.[36] The ReEnergy Black River generation facility is a

[33] *See* 2016 DCR Filing at 12-13; and PSL § 172.

[34] PSL § 172 (emphasis added).

[35] NYSPSC/NYSERDA Protest at 17-18.

[36] Notably, coal-to-natural gas conversions present a uniquely different scenario in which the decreases in the level of adverse pollutants that result from the conversion are considered in the

60 MW facility that initially commenced operations in 1988 operating on coal. In 2014, after retrofitting and upgrades, the facility recommenced operations using biomass as its primary fuel source.[37] The Indeck-Oswego Energy Center is a 50 MW natural gas fired cogeneration facility that initially commenced operations in 1990.[38] The applicable environmental requirements and state of backend control technology were fundamentally different more than 25 years ago and are not informative as to current requirements. The Samuel A. Carlson facility is a less than 100 MW cogeneration facility that initially commenced operations in 1951 operating on coal. The plant was later upgraded and converted to operating on both coal and natural gas with the installation of a natural gas fired combustion turbine engine in 2002.[39] Similar to the Indeck-Oswego facility, the applicable state of control technology and environmental requirements applicable more than 15 years ago are not informative as to current conditions and requirements. Given the vintage and nature of the facilities cited, as well as the fundamental differences in environmental requirements and control technology that existed when these facilities initially commenced operations, they are neither relevant nor informative to current environmental requirements and the application thereof to a new peaking plant design consistent with those proposed by the NYISO.

The NYISO's proposal to include SCR emissions controls in the peaking plant design for the NYCA ICAP Demand Curve for this DCR appropriately accounts for the changes in the

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permitting process. The improvements that result solely from the fuel conversion may produce sufficient levels of emissions reductions to avoid the need for including backend controls.

[37] Notably, the ReEnergy Black River facility consists of circulating fluidized bed ("CFB") boilers. There are unique challenges to the use of SCR emissions controls on CFB boilers that are irrelevant to the use of such backend controls on a gas fired combustion turbine, such as the proposed peaking plants.

[38] NOx emissions at the Indeck-Oswego facility are controlled with steam injection.

[39] NOx emissions associated with the combustion turbine are controlled using water injection.

applicable regulatory requirements since the last reset. These changes now demonstrate that a representative peaking plant design should include SCR emissions controls in all locations throughout New York. The Commission should approve the NYISO's proposal, which seeks to ensure that the peaking plant design is able to achieve compliance with all applicable environmental requirements.

3. Continued Inclusion of Dual Fuel Capability in the Peaking Plant Design for the G-J Locality Remains Appropriate, and a Gas-Only Plant Design Remains Viable for the NYCA ICAP Demand Curve

The NYISO and the Independent Consultant assessed whether the peaking plant design for all locations should include dual fuel capability for this DCR.[40] This assessment included consideration of many factors, such as economics, reliability benefits, tariff and other requirements that mandate dual fuel capability, siting flexibility, and market conditions.[41] Based on this assessment, the NYISO proposes to maintain dual fuel capability as part of the peaking plant designs for NYC, LI and the G-J Localities and continue use of a gas-only design for the NYCA ICAP Demand Curve.[42]

Certain parties oppose the continued inclusion of dual fuel capability as part of the peaking plant design for the G-J Locality.[43] These parties attempt to re-litigate essentially the

[40] 2016 DCR Filing at 15-18.

[41] *Id*. Contrary to the assertion of certain parties, the NYISO's proposal does not assume that the G-J Locality ICAP Demand Curve peaking plant connects to a local distribution company ("LDC") gas system. (NYSPSC/NYSERDA Protest at 8; and MI/City Protest at 14). The peaking plant design and cost estimates are based on generic site conditions. The NYISO clearly stated that the inclusion of dual fuel capability in the peaking plant design for the G-J Locality ICAP Demand Curve improves siting flexibility by accommodating a connection to either a LDC gas system or an interstate gas pipeline. (2016 DCR Filing at 18.)

[42] 2016 DCR Filing at 15-18.

[43] NYSPSC/NYSERDA Protest at 6-16; MI/City Protest at 13-20; UIU Protest at 9-10; and National Grid Comments at 14-15.

same arguments considered and ultimately rejected by the Commission in the last reset.[44] As indicated by the NYISO's assessment in this DCR, the circumstances and conditions present in the G-J Locality have not changed. In the absence of changed circumstances, it is not appropriate to alter the Commission's prior determination that the peaking plant design for the G-J Locality should include dual fuel capability in order to qualify as economically viable.[45]

A primary contention of the parties opposing dual fuel capability for the G-J Locality is the absence of a mandatory dual fuel requirement as part of electric reliability, interconnection or other capacity market participation requirements.[46] In absence of such a mandatory requirement, these parties contend that dual fuel capability should only be included as part of the peaking plant design if the incremental revenues associated with such capability fully offset the costs thereof for the three year historic period used in estimating net Energy and Ancillary Services ("EAS") revenues for the 2017/2018 Capability Year.[47] Because the incremental costs of

[44] *See New York Independent System Operator, Inc.*, 146 FERC ¶ 61,043 at P 78-83 (2014) ("2013 DCR Order").

[45] 2016 DCR Filing at 16-18.

[46] NYSPSC/NYSERDA Protest at 6-7; MI/City Protest at 13; UIU Protest at 9; and National Grid Comments at 14-15. In their comments, Con Edison and Orange and Rockland contend that the NYISO's proposal to include dual fuel capability in the peaking plant designs for the NYC and G-J Locality ICAP Demand Curves should be conditioned on revisions to the NYISO's tariffs to include a mandatory dual fuel requirement for all new generators interconnecting within these capacity regions. (Con Edison Comments at 5.) In contrast, IPPNY contends that the Commission should direct the NYISO to revise the Services Tariff to include an automatic revision to the NYCA ICAP Demand Curve upon implementation of capacity market performance rules that "effectively require dual fuel capability or firm gas arrangements." (IPPNY Limited Protest at 14.) As noted in the 2016 DCR Filing, the NYISO already has a project slated for 2017 to examine fuel/performance assurance in the capacity market. (2016 DCR Filing at 16.) The Commission should not prejudge the outcome of this upcoming initiative, or otherwise unnecessarily constrain the NYISO's normal shared governance stakeholder process in addressing these matters. Accordingly, the Commission should reject the requests of Con Edison and Orange and Rockland and IPPNY. Any implications on the ICAP Demand Curves should be evaluated and discussed as part of this separate initiative.

[47] NYSPSC/NYSERDA Protest at 9-12; MI/City Protest at 13-14 and 16-17; UIU Protest at 9-10; and National Grid Comments at 15.

including dual fuel capability in the peaking plant design for the G-J Locality are not fully offset by the incremental net EAS revenues associated therewith for the 2017/2018 Capability Year, these parties allege that the NYISO's proposal to include such capability is inappropriate.[48]

The NYISO's consideration of multiple factors, including economics, reliability and other benefits and costs, in assessing whether an economically viable peaking plant should include dual fuel capability is consistent with Commission precedent.[49] The NYISO's assessment did specifically consider the economics of including dual fuel capability. For the G-J Locality, however, the NYISO determined, consistent with the last reset, that consideration of a broader set of relevant factors favors inclusion of dual fuel capability for this capacity region.[50]

In contrast, for the NYCA ICAP Demand Curve, the NYISO concluded that continued use of a gas-only peaking plant design remained reasonable for this DCR.[51] Unlike the G-J Locality, the NYISO concluded that the consideration of other relevant factors did not indicate a need for the NYCA ICAP Demand Curve to include dual fuel capability at this time. This conclusion, in part, recognizes that the current economics of dual fuel capability for the NYCA ICAP Demand Curve favors retaining use of a gas-only peaking plant design for this DCR.[52]

Accordingly, the Commission should approve the NYISO's proposal to maintain dual fuel capability for the G-J Locality ICAP Demand Curve, while continuing to utilize a gas-only peaking plant design for the NYCA ICAP Demand Curve.

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[48] *Id.*

[49] *See, e.g.*, 2013 DCR Order at P 83.

[50] 2016 DCR Filing at 16-18.

[51] IPPNY and the MMU (as it relates to Load Zone F) oppose the NYISO's proposal to continue use of a gas-only peaking plant design for the NYCA ICAP Demand Curve. (IPPNY Limited Protest at 7-14; and MMU Comments at 7-8.)

[52] 2016 DCR Filing at 18.

4. The Capital Cost Estimates Developed by the Independent Consultant Are Reasonable and Appropriate for New York

The NYISO proposes to adopt the peaking plant capital investment cost estimates developed by the Independent Consultant. These estimates were fully vetted with stakeholders throughout the DCR process and were developed by the Independent Consultant using their proprietary power plant cost and performance models, updated vendor budgetary cost estimates, updated labor wage rates and the Independent Consultant's prior experience with the development of generation projects in New York, including New York City.[53]

Certain parties contend that the Independent Consultant's cost estimates may overstate the cost of constructing a new peaking plant in New York.[54] To support their position, these parties compare the cost estimates developed for this DCR with those developed in the last reset, as well as recent cost estimates developed for a simple cycle H class frame turbine in ISO-NE.[55]

Simple comparisons between cost estimates developed in the last reset to those developed in this DCR fails to recognize changes in costs that have occurred over the intervening period. Pricing and estimates for many of the cost categories related to power plant construction vary with time and market conditions, such as the pricing estimates for equipment (including the turbine generator set) and bulk materials.[56] Such changes in cost over time must be considered when attempting to compare cost estimates from different time periods.[57]

[53] *Id*. at 18-19; and *Supplemental Affidavit of Thomas A. Vivenzio* attached hereto as Attachment II, at ¶ 3-5 ("Supplemental Lummus Affidavit").

[54] NYSPSC/NYSERDA Protest at 53-55; and UIU Protest at 10-11.

[55] *Id*.

[56] Supplemental Lummus Affidavit at ¶ 3.

[57] *Id*.

The Independent Consultant has also noted that differences in the assumed costs for interconnection (both electric and gas) are a major driver of the cost differentials between last reset and this DCR.[58] Although the estimated interconnection costs for this DCR are higher than last reset, the cost estimates developed by the Independent Consultant are reasonable and appropriate. The Independent Consultant conducted a rigorous and detailed assessment to determine the appropriate electrical interconnection costs for each location that included a review of certain recent facility interconnections in New York.[59] Gas interconnection costs were estimated using an industry standard average cost per inch diameter per mile of the interconnection length.[60] This average cost was then multiplied by an assumed interconnection length for each location that was derived from a review of recent gas interconnections for generation facilities interconnecting in New York.[61] The sound analytic approach utilized by the Independent Consultant resulted in the development of reasonable and appropriate estimates of the likely cost to interconnect a new peaking plant in New York.

In addition, certain of the assumptions from the last reset have also changed, resulting in additional costs. For example, the assumed on-site fuel storage for the peaking plant designs that include dual fuel capability was increased from a three day on-site reserve to the equivalent of a four day reserve for this DCR.[62] This increase in on-site fuel reserves placed upward pressure on the cost of dual fuel capability for this DCR compared to the last reset due to increased tank

[58] *Id.* at ¶ 5.

[59] *Id.*

[60] *Id.*

[61] *Id.*

[62] 2016 DCR Filing at 32.

sizing to accommodate the additional on-site reserves and related costs to provide on-site storage availability, including the initial cost to purchase the additional on-site fuel reserve volume.

Although the capital investment cost estimates produced for this DCR are greater than those developed last reset, the Independent Consultant's estimates are reasonable and appropriate and represent current market conditions and the requirements attendant to power plant construction in New York. Notably, the Independent Consultant concluded that the difference between the estimates from the last reset and this DCR are within the accuracy of the type of project cost estimates produced for the DCR.[63]

Furthermore, it is not appropriate to compare capital investment cost estimates to develop projects in different states and control areas unless it can be demonstrated that the assumptions upon which each estimate are based are identical. The Independent Consultant has developed its cost estimates to be specific to construction in New York, accounting for the applicable costs and requirements in New York.[64] Costs to develop a project in a different region, such as ISO-NE, are likely to vary from the cost estimates for a similar project in New York due to differences in the assumptions related to plant design and site conditions, construction approach, electric and gas interconnection design, and labor costs and productivity.[65]

Despite the existence of multiple factors that would tend to undermine the validity of cost comparisons from different regions that are developed by different companies, the Independent Consultant did conduct a high level review of the simple cycle H frame turbine cost estimates recently developed in ISO-NE. For purposes of comparison, the Independent Consultant

[63] Supplemental Lummus Affidavit at ¶ 9.

[64] *Id*. at ¶ 7.

[65] *Id*.

determined that the capital investment cost estimates it developed for Load Zone F would likely be most comparable to the ISO-NE cost estimates.[66] Without determining whether any such cost comparison was valid or informative, the Independent Consultant did conclude that the cost difference between the estimates developed for ISO-NE and its cost estimate for Load Zone F are within the accuracy of the type of estimates developed for the DCR.[67]

Parties contending that the Independent Consultant's capital investment cost estimates for the peaking plant are too high have not provided an alternative, contemporaneous estimate of the cost to construct such a plant in New York to demonstrate any material deficiency in the Independent Consultant's methodology or estimates. Notably, however, a developer assessing construction of a project at a specific site in New York City did provide the Independent Consultant with confidential data regarding the estimated cost for its project.[68] The project was based on generally the same plant design proposed by the NYISO for the NYC ICAP Demand Curve in this DCR (*i.e.*, a simple cycle, dual fuel F class frame turbine equipped with SCR emissions controls).[69] Although the confidential cost estimate for the specific project exceeded the estimated costs developed by the Independent Consultant for the NYC ICAP Demand Curve peaking plant, the cost differential is, in part, likely related to site and project specific costs and circumstances that are not directly accounted for in the generic site cost estimates developed for the DCR.[70] Moreover, the difference between the cost estimate developed by the Independent

[66] *Id.*

[67] *Id.*

[68] *Id.* at ¶ 6.

[69] *Id.*

[70] *Id.*

Consultant for the proposed peaking plant in NYC and the specific NYC project are within the accuracy of the type of estimates developed for the DCR.[71]

The capital investment costs developed by the Independent Consultant are reasonable and appropriate. These estimates reflect current market conditions and the likely cost of construction in New York based on the Independent Consultant's experience with power plant construction projects. The Commission should approve the NYISO's proposal to adopt the cost estimates developed by the Independent Consultant.

5. The 0.75% Property Tax Rate Outside NYC Is an Appropriate Value for a Peaking Plant

For all locations outside New York City, the NYISO proposes to maintain the 0.75% property tax rate that was approved by the Commission in the last reset.[72] This rate assumes that a peaking plant outside New York City will enter into a payment in lieu of taxes ("PILOT") agreement.[73] Continued use of the previously approved 0.75% rate is supported by analysis conducted by the NYISO and the Independent Consultant of publicly available PILOT data for several natural gas fired generators in New York.[74]

The New York Transmission Owners and National Grid contend that the Commission should reject the NYISO's proposal and instead require use of a property tax rate closer to 0.5% for the G-J Locality and NYCA ICAP Demand Curves.[75] To support their position, these parties advocate for using only a subset of the data relied upon by the NYISO and the Independent

[71] *Id.*

[72] 2016 DCR Filing at 21-22.

[73] *Id.*

[74] *Id.*

[75] NYTO Protest at 15-19; and National Grid Comments at 12-14.

Consultant.[76] They allege that excluding certain data points from the analysis will likely produce a more appropriate estimate of the likely property tax rates to be paid by a peaking plant pursuant to a PILOT agreement.[77] Notably, adopting the data segmentation and data point exclusions advocated for by the New York Transmission Owners and National Grid would essentially result in relying on the same data that the Commission determined in the last reset supported the use of a 0.75% property tax rate for locations outside New York City.[78]

Although the data set relied upon for this DCR is significantly greater than that used in the last reset, it still represents a fairly small overall set of data points from which to derive conclusions.[79] Further segmentation of the data, as recommended by the New York Transmission Owners and National Grid, may result in a set of data points that may not be representative of the proposed peaking plants, thereby undermining confidence in any conclusions that may be drawn from such a data set.[80]

Analyzing the entire data set yields effective property tax rates that range from 0.2% to 2.01%, with a median value of 0.83%, without any adjustments to the underlying value of the capital cost expenditure for each facility to be in common year dollar terms with the year in which the examined PILOT payments were made.[81] Including such an adjustment to the capital

[76] *Id.*

[77] *Id.*

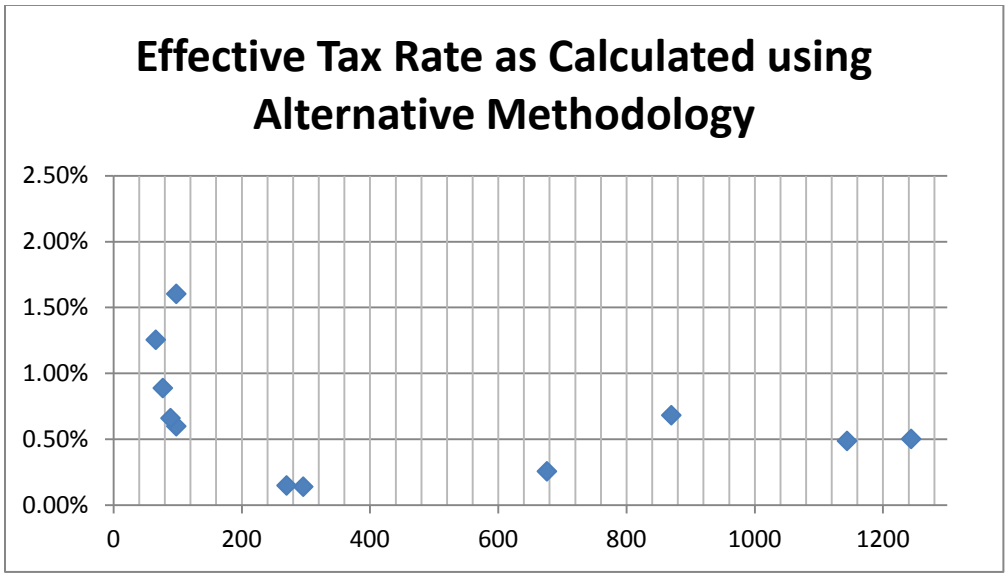
[78] *See, e.g.*, NYTO Protest at 18.

[79] In the last reset, PILOT payment data for three recent combined cycle facilities constructed in New York was utilized to inform the 0.75% property tax rate approved by the Commission for locations outside New York City. For this DCR, the Independent Consultant obtained publicly available PILOT payment data for 11 natural gas fired generators in New York.

[80] The average MW size of the facilities that would be encompassed by the data set advocated for by the New York Transmission Owners and National Grid is more than four times greater than the MW size of the NYISO's proposed peaking plants.

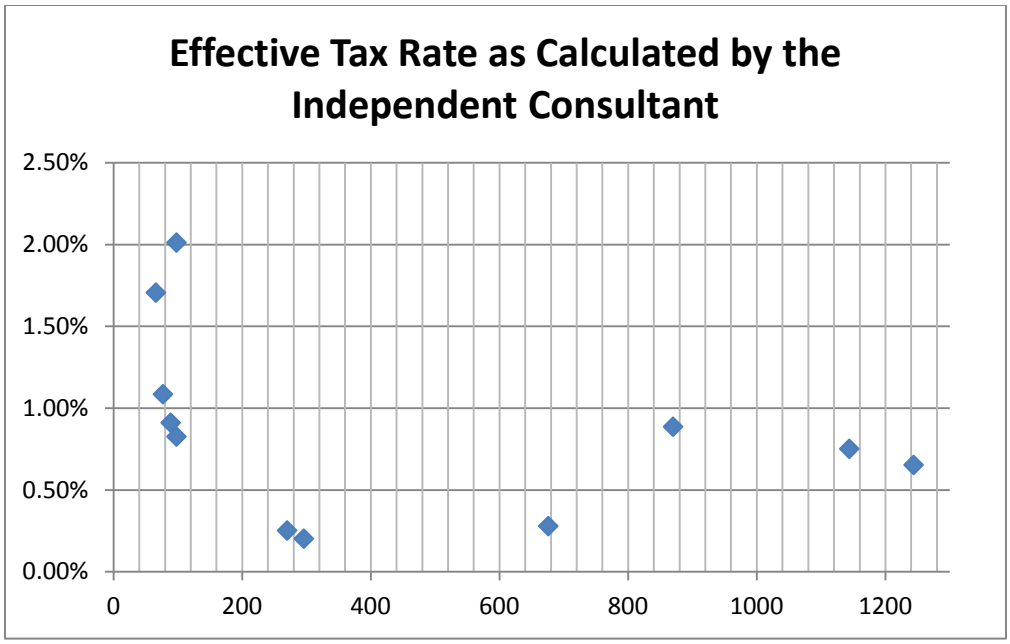
[81] 2016 DCR Filing at 21.

cost expenditure values yields effective property tax rates that range from 0.15% to 1.6% for all facilities that are located outside New York City.[82] The data set showed substantial variability across projects as to the effective property tax rates paid under PILOT agreements. However, the data demonstrates a general trend of higher effective property tax rates for smaller size units as demonstrated in the figures below.[83]



[82] *Id.* at 22.

[83] *Id.*, *Affidavit of David Allen* (Attachment V) at Exhibit A, p. 50. The Y-axis in the figures represents the effective tax rate for the units included in the data set developed by the Independent Consultant, while the X-axis represents the MW size of such units.



This trend supports the selection of a property tax rate that is toward the higher end of the range values encompassed by the data. Accordingly, continued use of the 0.75% property tax rate approved by the Commission in the last reset for locations outside New York City remains reasonable and appropriate.

The NYISO's proposed 0.75% property tax rate for peaking plants located outside New York City is consistent with recent data regarding PILOT payments by natural gas fired generators in New York. This value represents a reasonable approximation of the property tax rates that are likely to be incurred by new peaking plants constructed outside New York City and should be accepted by the Commission.

B. Net EAS Revenue Offset

The enhancements to the DCR process approved earlier this year by the Commission included the use of a more formulaic, transparent and predictable methodology for estimating the

net EAS revenues earned by a peaking plant from participation in the NYISO markets.[84] The new methodology relies on actual historic data inputs to derive estimated net EAS revenues. The net EAS revenues model logic, assumptions and data inputs were thoroughly vetted with stakeholders throughout the DCR process. In certain instances, stakeholders advocated for modifications to the model logic and/or inputs and assumptions that were not adopted.[85] All such recommendations were fully considered by the NYISO and the Independent Consultant as part of the model's development. In some cases, suggested modifications were not adopted because it is not anticipated that their adoption would materially change the net EAS revenue estimates produced by the model, while requiring significant additional complexity to implement. Such additional complexity, without material improvements in accuracy, could result in undermining the transparent, predictable and formulaic nature of the net EAS revenues model. These critically important attributes of the revised methodology are intended to improve the ability of market participants to better understand and forecast future capacity market outcomes. In other cases, certain changes to the data inputs advocated by stakeholders were not adopted because they could result in adversely impacting the revenues estimated by the model for this DCR.[86]

The net EAS revenues model developed by the Independent Consultant fairly balances the competing views expressed by stakeholders, while producing reasonable and appropriate net EAS revenue estimates based on actual historic data and market outcomes.[87] The net EAS

[84] Docket No. ER16-1751-000, *New York Independent System Operator, Inc.*, Proposed Services Tariff Revisions to Implement Enhancements to the Periodic Reviews of the ICAP Demand Curves at 5-7 (May 20, 2016); and *New York Independent System Operator, Inc.*, 156 FERC ¶ 61,039 at P 16 (2016).

[85] *See, e.g.*, 2016 DCR Filing at 30-33.

[86] *See, e.g., id.* at 25-26.

[87] *Id.* 22-35.

revenues model and associated data inputs and assumptions are designed to comport with the overarching objectives of increased transparency and predictability with respect to DCR outcomes, while simultaneously providing an understandable model that is capable of being used by market participants to develop forecasts of future outcomes, including the tariff-prescribed annual updates. As such, the Commission should accept the proposed net EAS revenues model without modification.

1. The Proposed Natural Gas Hub Pricing Points Are Reasonable and Appropriate

Fuel costs are a primary driver of the variable costs to produce energy for fossil fuel fired generators, such as the proposed peaking plants. Therefore, the selection of appropriate fuel prices for each location is critically important to the accuracy of the net EAS revenues produced by the model. The NYISO and the Independent Consultant conducted a rigorous, multi-factor assessment to determine the appropriate natural gas hub pricing point for each location evaluated in this DCR.[88] The factors considered were: (i) market dynamics, including the relationship between gas hub prices and LBMPs for a given location; (ii) the liquidity and depth of trading activity at the hub; (iii) the use of the hub in past resets or other NYISO studies and assessments; and (iv) the geographic proximity of the hub to a given location. The multi-factor assessment is intended to assist in the selection of gas hub pricing points that provide a reasonable approximation of marginal fuel supply costs in the NYISO-administered wholesale energy market, while simultaneously ensuring that the gas hub pricing points exhibit sufficient robustness and liquidity of trading to provide the necessary certainty as to the stability and reasonableness of their respective gas price values on a going forward basis. The table below

[88] *Id*. at 25-30; and Supplemental AG Affidavit at ¶ 7-12.

provides the applicable natural gas hub pricing points that were determined as a result of this assessment and proposed by the NYISO.[89]

Load Zone	Natural Gas Hub
Load Zone C	TETCO M3
Load Zone F	Iroquois Zone 2
Load Zone G	Iroquois Zone 2
Load Zone J	Transco Zn 6 NY
Load Zone K	Transco Zn 6 NY

Certain parties oppose several of the NYISO's proposed natural gas hub pricing points.[90] The primary gas hub pricing points of concern are those proposed for Load Zones C and G (Rockland County).[91] Certain of these parties advocate for use of Dominion as the appropriate gas hub pricing point for Load Zone C and Millennium for Load Zone G (Rockland County).[92] Alternatively, certain other parties contend that blended gas hub prices should be used for Load Zones C and G.[93] In advocating for alternative gas hub pricing points for these locations, many

[89] 2016 DCR Filing at 25-30. Contrary to the allegations of certain parties, the proposed use of TETCO M3 for Load Zone C and Iroquois Zone 2 for Load Zone G are not based on the use of forecasted gas prices. (NYTO Protest at 8-9; MI/City Protest at 38-40; and National Grid Comments at 10-11). In compliance with the requirements of the Services Tariff, the NYISO and the Independent Consultant used the actual, historic gas prices as published by SNL Financial for purposes of estimating the net EAS revenues for the 2017/2018 Capability Year. The multi-factor assessment utilized to determine the appropriate gas hubs for each location likewise relied strictly on actual, historical gas prices for each candidate gas hub pricing point as reported by SNL Financial.

[90] NYTO Protest at 2-14; NYSPSC/NYSERDA Protest at 37-48; MI/City Protest at 35-44; National Grid Comments at 8-12; UIU Protest at 11-12; and MMU Comments at 2-5 (limited to addressing the gas hub pricing point selection for Load Zone G).

[91] *Id.*

[92] *Id.*

[93] NYSPSC/NYSERDA Protest at 47-48; and MMU Comments at 2-5 (limited to addressing the use of a blended gas hub price for Load Zone G). The MMU also argues that, in light of the dynamics and pricing differences between Load Zones C and F, the Commission should direct the NYISO to alter its current rules for determining whether New Capacity Zones are necessary. (MMU Comments at 5-7.) The request to alter the rules for developing New Capacity Zones is beyond the scope of this proceeding and, therefore, should be rejected by the Commission. In accordance with the requirements of the

of the opposing parties contend that the multi-factor assessment used by the NYISO and the Independent Consultant is not appropriate. These parties allege that geography should be most important, if not the sole, selection criterion. Certain of these parties also contend that the Section 5.14.1.2.2.2 of the Services Tariff requires that gas hub pricing point selection be based primarily, if not solely, on geography.[94]

The NYISO does not agree with the tariff interpretation proffered by certain opposing parties.[95] The relevant language in Section 5.14.1.2.2.2 is intended to recognize that the DCR involves an assessment of multiple potential locations for a peaking plant. Accordingly, it is necessary, as part of the DCR, to determine appropriate gas hub pricing points for each of the locations evaluated. This language is not intended to prescribe the methodology or factors to be considered in making such determinations. Rather, as was the case here, these are decisions to be made as part of the extensive stakeholder process required by the DCR. Ultimately, the appropriate gas hub pricing points for each location and the manner in which they should be selected are driven by the DCR process and the Commission's determinations relating thereto. This provides the necessary flexibility for determinations made from DCR-to-DCR to evolve and appropriately account for the conditions and circumstances attendant to each reset.

Services Tariff, the NYISO recently conducted the required New Capacity Zone study. This assessment determined that there is no need to create any New Capacity Zones in New York at this time. (Docket No. ER16-1280-000, *New York Independent System Operator, Inc.*, Report of the Results of Triennial NCZ Study (March 28. 2016).) Furthermore, as required by Commission precedent, the NYISO conducted a deliverability assessment for each of the peaking plants assessed as part of this DCR. This assessment determined that the peaking plants for Load Zones C and F were fully deliverable. (2016 DCR Filing at 19-20.)

[94] NYTO Protest at 4-6; NYSPSC/NYSERDA Protest at 38-39 and 42-43; MI/City Protest at 35, 37-38 and 40-42; and National Grid Comments at 8-9.

[95] 2016 DCR Filing at 30.

The multi-factor assessment conducted by the NYISO and the Independent Consultant determined that, for this DCR, the alternative gas hub pricing points advocated for by the opposing parties for Load Zones C and G (Rockland County) are not appropriate. In fact, the assessment demonstrates that the use of these alternatives for this DCR may adversely affect, potentially significantly, the accuracy and reasonableness of the net EAS revenue estimates for the peaking plants.

For this DCR, the relationship between a candidate gas hub's prices and LBMPs within a given location is a very important factor.[96] A weak relationship with LBMPs for a location indicates that a candidate gas hub pricing point likely is not reflective of marginal fuel supply costs in the electricity market. This relationship is especially important during periods of gas price spikes that cause coincident spikes in LBMPs, such as during the winter 2013/2014 period. The assessment demonstrated that over the past nearly four years of historical data regarding gas hub prices and LBMPs, Dominion and Millennium exhibited very little relation to the trends in LBMPs for Load Zones C and G, especially during critically important periods such as winter 2013/2014.[97]

The use of gas hub pricing points that lack a historical relationship with electricity market dynamics presents a significant risk of undermining the accuracy and reasonableness of the net EAS revenue estimates produced by the net EAS revenues model.[98] The use of such gas hubs may overstate, significantly, the net EAS revenues of the peaking plants. In fact, sensitivity

[96] *Id*. at 25-28; and Supplemental AG Affidavit at ¶ 10-11. Notably, TETCO M3 is commonly used proxy for gas prices in Load Zone C across multiple NYISO studies, including prior and the most recent Congestion Assessment Resource Integration Study ("CARIS") and past DCRs.

[97] Data and information reviewed by the Independent Consultant indicates that the current pricing reported for the Millennium gas hub pricing point does not fully reflect the conditions present on this pipeline in Load Zone G. (Supplemental AG Affidavit at ¶ 9.)

[98] 2016 DCR Filing at 25-26.

analysis conducted by the NYISO demonstrated that due to the substantial increase in net EAS revenues that would result from using these gas hubs that lack a historical relationship with LBMPs, the resulting ICAP Demand Curves that would be produced using these hubs would consist of a reference point price that is 40% lower than the currently effective value (*i.e.*, the value for the 2016/2017 Capability Year approved by the Commission in the last reset) for the NYCA ICAP Demand Curve and 60% lower than the currently effective value for the G-J Locality ICAP Demand Curve.[99]

Furthermore, the introduction of annual updates to the ICAP Demand Curves and the tariff requirement that gas hub pricing point selections remain fixed for the four year period covered by each reset, underscore the critical importance of ensuring that the gas hub pricing points selected are liquid and exhibit a strong history of robust trading activity.[100] Such liquidity helps to ensure that the pricing produced by a gas hub is likely to remain reasonable and appropriate on a going forward basis.

The opposing parties advocating for the use of Millennium for Load Zone G (Rockland County) are forced to acknowledge the shortcomings with respect to this gas hub pricing point as it relates to its history of trading activity.[101] These parties correctly acknowledge that the Millennium gas hub pricing point's historic pricing data, as reported by SNL Financial, fails to provide enough historical data to calculate net EAS revenues for the 2017/2018 Capability Year. These parties attempt to gloss over this deficiency by suggesting that it can be remedied by

[99] *Id*. at 26. As noted below, the Millennium gas hub pricing point data reported by SNL Financial is insufficient to accurately calculate the net EAS revenues for the 2017/2018 Capability Year using this pricing point alone.

[100] *Id*. at 29.

[101] NYTO Protest at 11; NYSPSC/NYSERDA Protest at 43-44; MI/City Protest at 43; and UIU Protest at 12.

utilizing a combination of gas hubs in order to determine net EAS revenues for the 2017/2018 Capability Year.[102] The inability of the available data for Millennium from SNL Financial to provide sufficient historic data clearly demonstrates its insufficiency at this time. This relative paucity of sufficient and reliable trading history, especially in comparison to readily available and reasonable alternatives, underscores the inappropriateness of using the Millennium gas hub pricing point at this time.

Moreover, data regarding historic trading activity raises material concerns regarding the current liquidity and robustness of trading at the alternative gas hub pricing points recommended by the opposing parties. The NYISO's review of proprietary gas hub trading data strongly supports the use of the NYISO's proposed gas hub pricing points for this DCR. Over the past four years, both TETCO M3 and Iroquois Zone 2 have demonstrated persistent levels of substantial trading activity that are far more robust than the alternatives of Dominion North and Millennium, respectively. For example, the volume of gas traded at the TETCO M3 gas hub was more than 200 times greater than the volume of gas traded at Dominion North in 2013. While trading activity at the Dominion North gas hub has increased in more recent years, the volume of gas traded at TETCO M3 was still more than four times greater than Dominion North in 2014 and more than double the volume traded at Dominion North in 2015. With respect to Load Zone G (Rockland County), similar to Load Zone C, the level of trading activity at the Millennium gas hub has increased in recent years. However, over the past four years, the volume of gas traded at Iroquois Zone 2 is nearly double the volume of gas traded at Millennium. The more robust and persistent trading activity exhibited by TETCO M3 and Iroquois Zone 2 provide far greater

[102] NYTO Protest at 11-12; NYSPSC/NYSERDA Protest at 44-45; MI/City Protest at 43; and UIU Protest at 12.

confidence in the sustained liquidity and stability of these gas hub pricing points for the four year period encompassed by this DCR.[103]

The use of "blended" gas hub prices is also not appropriate at this time. The appropriateness of any price blending requires significant evaluation and discussion with stakeholders prior to being pursued further.[104] Such comprehensive analysis is necessary in order to determine whether the concept of blending is appropriate for any given location, and, if so, what the appropriate methodology for any such blending should be. Such methodology would need to determine for a given location the correct mix of gas hub pricing points that should be included in any such blending, as well as the appropriate weight to be assigned to each such hub. Furthermore, analysis would need to be conducted to verify that any such methodology is likely to continue to yield appropriate and reasonable prices over the entirety of the four year period encompassed by the reset. Unfortunately, the concept of blended gas prices was not introduced by stakeholders in this DCR until the tail end of the process and after the Independent Consultant had already issued its final report, thereby preventing the necessary assessment, analysis and stakeholder discussions described above.[105] As a result, the NYISO is without any principled rationale, at this time, for developing what, if any, "blend" may be

[103] The NYISO shares the MMU's desire to ensure that the ICAP Demand Curves, over the long-term, produce efficiency pricing signals to guide investment decisions. (MMU Comments at 3-5.) For this DCR, the NYISO has proposed the most appropriate gas prices for each location based on the conditions present at this time. However, as has been previously recognized by the Commission, the potential for changed circumstances over time is a primary reason for conducting periodic reviews of the ICAP Demand Curves. (2013 DCR Order at P 74.) As part of the next DCR, the NYISO will again review all of the relevant data and information regarding the conditions present at such time, including the manner in which such conditions may have evolved or otherwise changed since the prior reset, and determine anew the most appropriate gas prices for each location.

[104] 2016 DCR Filing at 30; and Supplemental AG Affidavit at ¶ 13-16.

[105] Supplemental AG Affidavit at ¶ 14.

appropriate for any given location that would ensure that such calculated, blended pricing outcomes would be appropriate and sustainable for this four year reset period.

Certain parties advocate that use of blended prices is simple and arbitrarily recommend certain blending methodologies that would merely equally weight historic prices from certain gas hub pricing points.[106] It is important to recognize that the use of blended prices is far more complex than suggested by these parties. While it is easy to simply put forth an arbitrary methodology to accomplish a blended price, this does not mean that such methodology will result in producing appropriate or reasonable prices and results. Simply developing an average of the prices from two potential gas hub pricing points does not necessarily result in the production of an outcome where the net EAS revenue estimates produced using such a blended price and the resulting reference point price of the ICAP Demand Curve is equal to the average of the results produced by independent use of the underlying gas hub pricing points.[107] Instead, the concept of blending is akin to the creation of a new, artificial gas hub pricing point with its own historic pricing. Because gas prices serve as a critical component to the variable costs of the peaking plant, the new gas prices produced by any blending methodology may result in fundamental alteration of the commitment and dispatch of the peaking plant that bears little resemblance to the commitment and dispatch produced using each of the underlying gas hub pricing points independently. Absent a comprehensive assessment of the historic gas prices that

[106] *See, e.g.*, NYSPSC/NYSERDA Protest at 47-48. These parties advocate for the use of gas hub pricing points (*i.e.*, Dominion and Millennium) in developing blended prices that were determined by the multi-factor assessment to be inappropriate for use at this time and/or materially inferior compared to readily available, reasonable alternatives. (NYSPSC/NYSERDA Protest at 47-48; and MMU Comments at 3.) It is unclear why gas hub pricing points that are materially deficient with respect to several of the factors considered by the Independent Consultant's and the NYISO's assessment should be deemed appropriate or reasonable to use in the context of any price blending at this time. (Supplemental AG Affidavit at ¶ 14.)

[107] Supplemental AG Affidavit at ¶ 16.

would be produced from any given blending methodology, similar to the multi-factor assessment that was conducted to derive the gas hub pricing points proposed by the NYISO herein, there is relatively little, if any, certainty that the unit commitment and dispatch produced by a blended price and resulting net EAS revenue estimates will be appropriate and reasonable.

Furthermore, the NYISO has concerns that the concept of blending could result in a process that materially departs from a principled approach to determining the appropriate and representative gas hub pricing point for each location and, instead, become more of a results oriented exercise. The multi-factor assessment conducted by the NYISO and the Independent Consultant is intended to derive the selection of appropriate and reasonable gas hub pricing points that, among other matters, exhibit: (i) pricing that is reflective of electricity market dynamics for a given location; and (ii) robust trading that provides confidence as to the sustainability and stability of prices going forward. The use of blending, however, as evidenced by the positions of certain parties in this proceeding, may be more results oriented and driven toward the achievement of certain reference point price values for the ICAP Demand Curves. The NYISO believes that such results oriented decision making could produce outcomes that undermine market confidence in the DCR process and resulting ICAP Demand Curves to the determinant of all market participants.

Lastly, as the Commission is aware from prior resets, the NYISO's processes and procedures to begin preparation for the Summer 2017 Capability Period capacity auctions commence in February 2017. Accordingly, the NYISO needs certainty with respect to the ICAP Demand Curves that will apply for the 2017/2018 Capability Year within this timeframe. Given the relative lack of time available, if, *arguendo*, the Commission was to determine that the use of blended pricing for Load Zone G (Rockland County) and/or Load Zone C should be further

considered, the NYISO does not envision that sufficient time would be available to conduct the necessary analysis, as described above, to determine whether any such blending is appropriate and, if so, what the correct methodology would be to ensure that any resulting blended prices are appropriate, sustainable and produce reasonable and accurate results.

Based on all the foregoing reasons, the NYISO and the Independent Consultant submit that the concept of blending is not ripe for consideration as part of this DCR and should be rejected by the Commission at this time.[108] Any further discussions related to the use of blended gas hub prices should be deferred until the next DCR to ensure that this complex topic can be appropriately evaluated and explored with stakeholders.

The multi-factor assessment used for this DCR has resulted in the selection of appropriate gas hub pricing points for each location. The selected gas hub pricing points are intended to represent liquid pricing locations that have a rich history of robust trading activity, while simultaneously providing a reasonable approximation of the likely marginal fuel supply costs underlying historic LBMPs for each location. Therefore, the NYISO's proposed natural gas hub pricing points should be accepted by the Commission.

C. Levelized Fixed Charge and Financial Parameters

Conversion of the upfront capital investment costs for each peaking plant, inclusive of property taxes and insurance, into an annualized level requires the determination of several parameters: (i) the appropriate weighted average cost of capital ("WACC") required by a developer to recover its up-front investment costs, plus a reasonable return on that investment; (ii) the appropriate term in years over which this investment is recovered (*i.e.*, the "amortization period"); and (iii) the applicable tax rates. The NYISO proposes to adopt the financial

[108] *Id*. at ¶ 14 and 16.

parameters determined by the Independent Consultant for purposes of calculating an annualized value for each peaking plant's up-front investment costs.[109] The financial parameters developed by the Independent Consultant are reasonable and appropriate. The proposed financial parameters were derived based on relevant data and information, as well as the Independent Consultant's reasoned judgment and experience, and are intended to appropriately account for the risks that would be faced by a merchant developer constructing a peaking plant in New York.[110]

Certain parties contend that the Commission should revise certain aspects of the proposed financial parameters to produce a lower resulting WACC.[111] These parties advocate for reductions to the proposed return on equity ("ROE") and cost of debt ("COD") values.[112] These parties also contend that the proposed debt to equity ratio ("D/E ratio") should be increased.[113] In support of their positions, these parties allege that the NYISO and the Independent Consultant have failed to fully explain and justify the proposed values for these parameters. Contrary to these assertions, the Independent Consultant fully explained and justified each of the proposed values.[114]

The Independent Consultant clearly explained to stakeholders that it did not intend to utilize the exact same methodology used in prior resets for determining the appropriate ROE value. The Independent Consultant also explained that the appropriate cost of capital should

[109] 2016 DCR Filing at 36-38.

[110] *Id.*; and Supplemental AG Affidavit at ¶ 17-19.

[111] NYSPSC/NYSERDA Protest at 49-53; and MI/City Protest at 44-48.

[112] NYSPSC/NYSERDA Protest at 49-51 and 52-53; and MI/City Protest at 45-48.

[113] NYSPSC/NYSERDA Protest at 51-52; and MI/City Protest at 47-48.

[114] 2016 DCR Filing at 36-38; and Supplemental AG Affidavit at ¶ 17-28.

reflect the risks attendant to merchant investment in a peaking plant project in New York and not the risks associated with the broader company or investment portfolio of the entity developing that project. To that end, instead of relying solely on results produced using the capital asset pricing model ("CAPM") for certain publicly traded independent power producing companies ("IPPs") and applying an after-the-fact basis adjustment adder to such results as had been done in the last reset, the Independent Consultant relied on the CAPM data as one relevant data point in determining the appropriate ROE value for merchant development of a peaking plant in New York.[115] In addition, the Independent Consultant reviewed relevant data and information pertaining to the required ROE for a stand-alone project finance approach.[116] The Independent Consultant noted that the ROE values produced by the CAPM (*i.e.*, 10.0%-12.5%) represented the lower bounds of the appropriation ROE for a merchant peaking plant development project in New York, while the required ROE for a project finance approach (*i.e.*, 15% or greater) established the appropriate upper bounds for the appropriate value.[117] Ultimately, the Independent Consultant selected the proposed value of 13.4% as representing a reasonable and appropriate balance between the lower values calculated for IPP asset portfolios and the higher values associated with a stand-alone project finance approach.[118] The value selected by the Independent Consultant provides an appropriate reflection of the likely project-level ROE value required to support the merchant development of a new peaking plant in New York.[119]

[115] 2016 DCR Filing at 36-37; and Supplemental AG Affidavit at ¶ 22-25.

[116] 2016 DCR Filing at 37; and Supplemental AG Affidavit at ¶ 22-25.

[117] *Id.*

[118] *Id.*

[119] Supplemental AG Affidavit at ¶ 23-24.

In recommending a proposed COD value of 7.75%, the Independent Consultant reviewed recent data regarding debt costs for IPPs.[120] This data demonstrated that IPP debt costs have ranged between 5% and 8% since 2013.[121] The Independent Consultant selected a value of 7.75% as being consistent with generic debt costs incurred in more recent months by entities with similar credit ratings as IPPs (*i.e.*, B rated entities).[122] In fact, data presented by the Independent Consultant to stakeholders demonstrated that the median cost of debt for entities with similar ratings to IPPs over the twelve month period from May 2015 to May 2016 was 7.75%.[123]

The D/E ratio proposed by the Independent Consultant was developed after assessing IPP capital structures, as well as other independent data regarding capital structures for projects similar to the proposed peaking plants.[124] In proposing a capital structure consisting of 55% debt to 45% equity, the Independent Consultant acknowledged that current IPP capital structures indicated far greater leverage than historic trends.[125] Contrary to the allegations of the opposing parties that the Independent Consultant failed to justify departing from more recent IPP capital structure trends,[126] the Independent Consultant noted publicly available information indicating that these trends in corporate-wide capital structure are unlikely to persist.[127] Specifically, the Independent Consultant cited certain recent announcements that several IPPs will seek to

[120] 2016 DCR Filing at 37; and Supplemental AG Affidavit at ¶ 21.

[121] *Id.*

[122] *Id.*

[123] Supplemental AG Affidavit at ¶ 21.

[124] 2016 DCR Filing at 37; and Supplemental AG Affidavit at ¶ 26-28.

[125] *Id.*

[126] NYSPSC/NYSERDA Protest at 52; and MI/City Protest at 47.

[127] 2016 DCR Filing at 37; and Supplemental AG Affidavit at ¶ 27.

deleverage their current capital structures, which would place greater pressure on limiting incremental debt for new projects.[128] The proposed D/E ratio value also reflects differences between project-level and corporate-level capital structures.[129] Use of a more leveraged D/E ratio, as recommended by the opposing parties, would result in placing upward pressure on the resulting WACC value.[130]

Although IPPNY recommends Commission approval of the proposed financial parameters and resulting WACC value, it alleges that the net EAS revenues model overstates the revenue earnings of the peaking plant and that this alleged overstatement of revenues, in part, supports the use of a slighter higher WACC value than approved by the Commission in the last reset.[131] The alleged concerns regarding the net EAS revenues model were fully considered during the DCR.[132] The assessment of each on these concerns ultimately concluded that adjusting the net EAS revenues model to account for them would be unlikely to materially affect the resulting net EAS revenue estimates produced by the model.[133] As such, it was determined that no adjustments to the model were necessary in response to these concerns.

Likewise, because these concerns are unlikely to materially impact the net EAS revenues estimates produced by the model, there is no need for the proposed financial parameters to expressly address them nor do they. Notably, however, the financial parameter values developed

[128] *Id*.

[129] Supplemental AG Affidavit at ¶ 27.

[130] *Id*. at ¶ 28.

[131] IPPNY Limited Protest at 29-30. These concerns relate to the historic real-time energy prices used by the model, the lack of specific logic to address potential fuel availability issues for both gas-only and dual fuel peaking plant designs, and the real-time (or intraday) natural gas prices utilized by the model.

[132] 2016 DCR Filing at 30-33; and Supplemental AG Affidavit at ¶ 17.

[133] *Id*.

by the Independent Consultant are intended to account for the risks faced by a merchant developer constructing and operating a peaking plant in New York.[134] The proposed financial parameters already expressly account for certain risks to the revenue earnings of a merchant peaking plant project in New York over time, including the variability of fuel prices, impacts related to changes in the demand for energy, energy and environmental policies, and impacts related to potential changes in infrastructure (*e.g.*, generation resource mix changes, transmission infrastructure and natural gas pipelines).[135]

The proposed financial parameters are reasonable and justified based on the assessment conducted and data and information relied on by the Independent Consultant. These parameters result in the calculation of a WACC value that appropriately accounts for the conditions and risks attendant to merchant development of a new peaking plant in New York. Accordingly, the proposed financial parameters should be accepted by the Commission without adjustment.

The NYISO has demonstrated that its proposed ICAP Demand Curves for the 2017/2018 Capability Year and proposed methodologies and inputs for conducting the tariff-prescribed annual updates for the 2018/2019 through 2020/2021 Capability Years are just and reasonable. The NYISO's proposal represents a fair balance between the divergent interests presented in this proceeding and are designed to result in the establishment of ICAP Demand Curves that provide appropriate price signals regarding the locational value of the capacity in New York. The Commission should, therefore, approve the NYISO's proposal without modification.

[134] 2016 DCR Filing at 36.

[135] *Id.*

III. CONCLUSION

The NYISO respectfully requests: (i) that the Commission issue an order on or before January 17, 2017 approving its proposal; and (ii) an effective date of January 17, 2017 for the proposed revisions to Section 5.14.1.2 of the Services Tariff to reflect the parameters of the ICAP Demand Curves for the 2017/2018 Capability Year.

Respectfully submitted,

/s/ *Garrett E. Bissell*
Garrett E. Bissell
Senior Attorney
New York Independent System Operator, Inc.
10 Krey Blvd.
Rensselaer, New York 12144
(518) 356-6107
gbissell@nyiso.com

Dated: December 22, 2016

cc: Michael Bardee
Nicole Buell
Anna Cochrane
Kurt Longo
Max Minzner
Daniel Nowak
Larry Parkinson
J. Arnold Quinn
Douglas Roe
Kathleen Schnorf
Jamie Simler
Gary Will

Attachment I

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc. **Docket No. ER17-386-000**

SUPPLEMENTAL AFFIDAVIT OF PAUL J. HIBBARD, DR. TODD SCHATZKI, AND CRAIG AUBUCHON

I. Qualifications

A. Paul Hibbard, Dr. Todd Schatzki, and Craig Aubuchon

1. We have previously provided an affidavit[1] as part of the New York Independent System Operator, Inc. (NYISO) initial filing in the above captioned docket that was submitted on November 18, 2016. Our qualifications are described therein.

II. Purpose and Summary of Supplemental Affidavit

2. This supplemental affidavit provides our response to certain comments and protests received in response to the NYISO's November 18, 2016 filing in this proceeding. First, for context we briefly summarize the process we used to arrive at our conclusions and recommendations, as described and documented in the Initial Affidavit and Final Report.[2] Next, we discuss two broad issues raised in comments and protests: 1) the selection of certain natural gas pricing hubs, and 2) concerns raised with respect to the proposed financial parameters, including the cost of equity, cost of debt, and debt to equity ratio.

[1] *See* Docket No. ER17-386-000, *New York Independent System Operator, Inc.*, Proposed ICAP Demand Curves for the 2017/18 Capability Year and Parameters for Annual Updates for Capability Years 2018/19, 2019/2020 and 2020/2021, Attachment III, *Affidavit of Paul J. Hibbard, Dr. Todd Schatzki, and Craig Aubuchon* (hereafter, the "Initial Affidavit"). Capitalized terms that are not specifically defined in this Supplemental Affidavit shall have the meaning set forth in the filing to which this affidavit is attached or, if not defined therein, the meaning set forth in the NYISO Market Administration and Control Area Services Tariff (Services Tariff).

[2] Hibbard, Schatzki, Aubuchon, Llop, Berk, Richert, Frazier, and Vivenzio, *Study to Establish New York Electricity Market ICAP Demand Curve Parameters*, September 13, 2016 (hereafter, the "Final Report" or "Consultants' Report"). The Final Report was included as Exhibit D to the Initial Affidavit.

III. Overview and Summary of the Final Report

3. As described in our Initial Affidavit, our final analyses and recommendations reflect information on data, assumptions and methods from a wide range of sources, applied to arrive at estimates of the cost of a new peaking plant in NYISO. Our recommendations were greatly aided and improved by the full scope of comments and opinions heard throughout the extensive stakeholder process required by the ICAP Demand Curve reset (DCR). Throughout the process, we received a wide set of often divergent stakeholder opinions on a wide range of assumptions and methods, including extensive comments on the estimation of net Energy and Ancillary Services (EAS) revenues and financial parameters.

4. The development of ICAP Demand Curve parameters necessarily requires the careful evaluation of a complex set of market and industry factors, and the application of reasoned and independent judgment in the face of uncertainty. For this reason, early in the process we developed a set of objectives and criteria to help guide our analysis and provide a framework for the evaluation of process and analytic alternatives. As described our Initial Affidavit, our assessment of ICAP Demand Curve parameters involved a complex mix of historical data, forecasts, and modeling techniques geared towards developing an accurate representation of New York's electricity market structures and dynamics. It involved extensive review of relevant data and analytic methods, and required a selection of methods, models and data from among a range of alternatives based on the application of decision criteria and professional judgment.

5. Equally important, no single parameter or decision was determined in isolation. Our determination for the appropriate values used to estimate the applicable reference point prices for the ICAP Demand Curves reflects consideration of the interrelationships between and among the various models. This includes the levelized capital costs (including financial parameters) and various critical inputs to the estimation of net EAS revenues (such as gas hub pricing locations). Our evaluation of ICAP Demand Curve parameters reflects our judgment, based on a structured and holistic evaluation of the interplay among localized market, industry and regulatory factors and financial risks faced by the hypothetical project developer in the New York electricity market context.

6. To this end, and as described in greater detail below, in our view the proposed locational ICAP Demand Curve parameters provide a fair and reasonable assessment of the divergent but inter-related issues introduced and discussed throughout the DCR process by Analysis Group, Inc. (AGI), Lummus Consultants International, Inc. (LCI), NYISO, market participants, and other stakeholders.

1. Net EAS revenues model natural gas hub pricing locations

7. As described in our Initial Affidavit, a key consideration with respect to the net EAS revenues model is the choice of natural gas pricing points (gas hubs) for each location. Given the existence of numerous pricing indices across New York, it is not necessarily a straightforward process to select the gas hub most appropriate for a peaking plant in a given Load Zone. Individual gas hubs reflect reported transactions under an array of ever-changing market players and factors, including existing and future contracts from local distribution companies (LDCs) and merchant generators, wholesale gas market conditions, and expectations about potential supply expansions (or lack thereof). Therefore, we developed our recommendations for the appropriate gas hub pricing points for each location based on a consideration of multiple factors, including market dynamics, gas hub liquidity, geography, and continuity with the use of similar hubs in other NYISO studies and assessments, including past DCRs and reviews conducted by the Market Monitoring Unit (MMU).

8. The selection of natural gas pricing indices is necessarily an exercise involving the application of analysis and judgment, and stakeholders with different viewpoints have come to different opinions on the appropriate pricing hubs. Some stakeholders identified factors that they contend would support a change in natural gas pricing locations or a blending of multiple natural gas pricing locations,[3] while others identified additional

[3] *See, e.g.*, Docket No. ER17-386-000, *supra*, Motion to Intervene, Comments and Protest of the City of New York and Multiple Intervenors at 35-44 (December 9, 2016) (hereafter, the "MI/City Protest"); Docket No. ER17-386-000, *supra*, Motion to Intervene and Protest of the New York Transmission Owners at 2-14 (December 9, 2016); Docket No. ER17-386-000, *supra*, Notice of Intervention and Protest of the New York State Public Service Commission and New York State Energy Research and Development Authority at 37-48 (December 9, 2016) (hereafter, the "NYPSC/NYSERDA Protest"); Docket No. ER17-386-000, *supra*, Comments of Niagara Mohawk Power Corporation d/b/a National Grid at 8-12 (December 9, 2016); Docket No. ER17-386-000, *supra*, Motion to Intervene, Comments, and Protest of the New York State Utility Intervention Unit at 11-12 (December 9, 2016); and

factors that they contend support our recommendation.[4] Specifically, commenters opposing our recommendations suggested that natural gas pricing locations in Load Zone C and G (Rockland County) should be based primarily or solely on geographic factors (one of the four factors we evaluated in our review), and/or that the NYISO should consider a blended gas price index in these locations. We have reviewed these comments and protests, and concluded that they do not alter our recommended natural gas pricing locations.

a) Geographic Considerations

9. As noted in our Final Report, gas indices capture pricing over broad geographic areas, which may include several different interconnects for producer and market segments. Based on this variation in infrastructure, individual gas price indices may not fully capture variation in pricing available to generators that occurs within particular Load Zones. This is particularly true in more constrained areas and areas with an increase in supply. The Millennium pricing hub provides one such example; independent studies have reported that gas prices for Millennium do not fully reflect increased throughput and utilization at the east end of the line, which is located in Load Zone G.[5] Our use of multiple factors provides one such check and balance on the strengths and weaknesses inherent in each factor, such as geography.

Docket No. ER17-386-000, *supra*, Motion to Intervene and Comments of the Market Monitoring Unit on the New York ISO's ICAP Demand Curve Reset at 2-5 (December 9, 2016) (hereafter, the "MMU Comments").

[4] *See*, *e.g.*, Docket No. ER17-386-000, supra, Motion to Intervene and Comments of Entergy Nuclear Power Marketing, LLC at 11-14 (December 9, 2016); and Docket No. ER17-386-000, *supra*, Limited Protest and Comments of Independent Power Producers of New York, Inc. at 22-26 and Exhibit II (December 9, 2016) (hereafter, the "IPPNY Limited Protest").

[5] *See*, e.*g.*, Levitan Associates, Inc. "NYCA Pipeline Congestion and Infrastructure Adequacy Assessment", September 2013, available at: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_egcwg/meeting_materials/2013-10-23/Levitan%20Pipeline%20Congestion%20and%20Adequacy%20Report%20Sep13%20-%20Final%20CEII%20Redacted.pdf. In the report, Levitan notes: "Although Millennium reports daily capacity for certain segments of its system, the available data does not line up with the Ramapo location [where gas enters the Algonquin mainline for redelivery to the Lower Hudson Valley and New England]" (at 68) and that "throughput increased significantly… due to commercialization of the Laser Northeast Gathering System and Bluestone Gathering System, which significantly increased producers ability to move gas from the Marcellus shale into Millennium for delivery to eastern New York." (at 69).

10. For upstate zones, including Load Zones C, F and G, we determined that the natural gas indices associated with certain pipelines in close proximity to certain of these zones do not currently reflect a reasonable expectation of the long-run equilibrium between gas and electricity markets. For example, in Load Zone C, the Dominion and Millennium pipelines cross portions of the zone, but the implied pricing from these indices does not capture any of the observed spikes in electricity markets during winter months. A narrow focus only on gas prices for trading locations solely located within each Load Zone and which are not related to market fundamentals could tend to over-estimate net EAS revenues, under-estimate the net Cost of New Entry (CONE), and fail to provide sufficient investment signals.

11. In light of these circumstances, an important factor in our identification of an appropriate gas index for each location was the historical relationship between gas prices and LBMPs. In some cases, it is apparent from comparison of gas indices and zonal LBMPs that during certain periods (particularly winter months) zonal LBMPs did not align well with fuel price indices nearby to that Load Zone. To the extent that a peaking plant could receive delivery of gas at these prices during these periods, these price differentials suggest a profitable opportunity for short-term arbitrage between natural gas and electricity markets, and thus likely do not reflect a long-run equilibrium.

12. In light of these factors, we developed our natural gas pricing locations considering multiple criteria, including geography, market dynamics, historical precedent and gas hub liquidity. Based on these considerations, and consistent with both the gas hub assumptions for the last reset and the NYISO 2015 Congestion Assessment Resource Integration Study (CARIS) Phase 1 analysis, we recommended the use of TETCO M3 as the appropriate natural gas index for Load Zone C. For Load Zone G (Rockland County), we recommended the use of the Iroquois Zone 2 pricing hub. This recommendation reflects the same balance of considerations as discussed for other Load Zones.

b) Blended Natural Gas Price Index

13. In addition, certain parties suggested that the NYISO consider the use of blended natural gas price indices. Specifically, the MMU recommended the use of a blended gas price

index for Load Zone G.[6] Other commenters suggested that if pricing points are not based solely on geographic considerations, then a blended natural gas price index for Load Zone C and Load Zone G (Rockland County) should be used.[7]

14. While we considered (and rejected) the potential use of blended natural gas price indices in developing our recommendation,[8] we did so largely because the use of a blended gas price index raises multiple questions, complications and design issues, particularly within the context of annual updating that we did not have sufficient opportunity (and time) to fully consider. Rather than adopt ad hoc recommendations for any blended gas price indices, we believe it prudent, at this time, to continue to rely on the recommended process for measuring gas prices using a single gas hub for each location. The decision to use blended gas hubs would require that approaches be developed to determine which locations should use blended gas hubs, which gas hubs among the many options available should be used in developing a blended index, in what proportion selected gas hubs would be blended, and whether criteria for screening potential hubs should differ from those we relied upon in our assessment.[9]

15. While we have not fully evaluated the use of blended gas indices, several conceptual and administrative drawbacks to using a blending of gas price indices are worthy of note. In particular, the use of blended gas indices would further complicate the process by which gas prices would be developed, including the process of stakeholder engagement. For example, a rule would need to be developed to identify the appropriate weight to assign to each index in a blending formula; one that (presumably) reflects an assessment of likely conditions and pricing assumed by the hypothetical developer when considering market entry over the four year period covered by this DCR. Gas prices could be weighted assuming a 50-50 split, or weighted by some more complex criteria (*e.g.*, the volume of

[6] MMU Comments at 3.

[7] NYPSC/NYSERDA Protest at 47-48.

[8] We note as well that stakeholder proposals to use blended gas prices were not raised until after we submitted our Final Report in August 2016.

[9] It is unclear whether it makes sense to include in any blending of gas prices, gas hubs that we rejected as failing multiple screening criteria (*e.g.*, the Millennium gas hub was rejected because it does not match market dynamics, has low liquidity, and is without precedent for use in other NYISO market analysis).

transactions over some identified historical period or the actual demand for natural gas by generators comparable to the proposed peaking plant). Based on the selected weighting, stakeholders and the NYISO would need to evaluate whether that weighting is reasonable to persist for the entire four year period covered by the DCR. Further, it is our understanding that, based on the current requirements of the Services Tariff, such weighting would need to remain fixed for the entire four year DCR period.

16. In addition, we note that the recommendation of blending gas prices is limited to select locations. Rather than adopt blending for these locations, ad hoc, future consideration of the use of blending should be assessed alongside and in parallel with discussions for development of net EAS revenue estimation.[10] Given the significant drawbacks discussed above, and the substantial analysis required to more fully assess and evaluate the use of blending, we do not recommend that the particular blended gas prices proposed in certain protests be adopted for this DCR.

IV. Financial Parameters

17. The financial parameters translate the upfront costs of developing new generation facilities into an annualized value that is an element of gross CONE. A number of stakeholders commented on our selection of financial parameters. Some stakeholders identified factors that they contend would support a higher weighted average cost of capital ("WACC"),[11]

[10] The recommendations to use blended gas prices appear to be driven, at least in part, by a concern regarding the estimated net EAS revenues and/or resulting ICAP Demand Curve reference point prices that result from our recommended gas hubs. However, given the realities of daily variation in gas and electricity prices, a simple blending of multiple gas hub prices will not necessarily yield the same results as a simple blending of the net EAS revenues or resulting ICAP Demand Curve reference point prices derived from the individual use of the gas hubs included as part of any such blending.

[11] IPPNY Limited Protest at 29-30. IPPNY identified flat load growth, reliance on Real-Time Commitment ("RTC") pricing (rather than a combination of RTC and Real-Time Dispatch pricing), and our choice of intra-day gas premia and discounts as factors that would support a higher WACC. Our analysis of the impact of the decision to rely on RTC pricing and our choice of intra-day gas premia/discounts, which was consistent with assumptions used by the MMU, suggests that our chosen approach was reasonable. *See* Analysis Group, "NYISO 2015/2016 ICAP Demand Curve Reset, Stakeholder Comments Related to Net Energy and Ancillary Service Revenues Model," (presented at the July 20, 2016 Installed Capacity Working Group), available at: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2016-07-20/AG%20Draft%20Net%20EAS%20Feedback%2007202016%20ICAPWG%20Final%207%2014%202016%20(2).pdf; Initial Affidavit at ¶ 45-46; and Final Report at 69-70.

while others identified factors that they contend support a lower WACC.[12] We have reviewed these comments and protests, and concluded that they do not alter our recommended financial parameters.

18. As explained in our Initial Affidavit, we developed our recommendation for the appropriate WACC to be used in this DCR based on our professional judgment, reflecting the particular circumstances of merchant development of a peaking plant in the NYISO market context; the many sources of information (identified in our initial affidavit and in our Final Report); past professional experience, including conversations with developers and the finance community; and our view of current industry conditions and market factors, including past experience with merchant development in the NYISO markets.

19. Our recommended WACC is slightly higher than the value approved in the last reset, as well as the currently approved and recommended values for neighboring regions, reflecting differences in the environment for investment in New York relative to the other regions, and the limited recent experience with merchant development in NYISO. Relative to the neighboring RTOs, developers within the NYISO region may face greater project-specific risk due to a variety of factors, such as lack of long-term contracts, greater uncertainty over the mix of supply and demand resources that will result from changes in regional markets and energy policies over time, expectations for relatively flat load growth, and potentially more challenging siting and development opportunities within New York.

20. Below, we describe information used in developing the individual financial parameters that bear on the recommended WACC and respond to certain comments raised in response to the NYISO's initial filing.

a) Cost of Debt

21. The protests suggest that the Commission should approve a cost of debt of 7.42 percent based on one day of quoted prices from one index of generic corporate bond yields for "B" rated issues.[13] By contrast, our recommended cost of debt of 7.75 percent reflects

[12] NYPSC/NYSERDA Protest at 49-53; and MI/City Protest at 44-48.

[13] NYPSC/NYSERDA Protest at 52-53; and MI/City Protest at 48.

information on bond yields from individual issues by IPPs, as well as a broader extent of historical information from the generic corporate index cited by the opposing parties. Our analysis showed that the cost of debt for bonds issued by IPPs often exceeded both the generic bond index and our recommended value. It also showed the cost of debt for B rated firms ranged from 6.25 percent to 10.2 percent for the 12 month period May 2015 to May 2016.[14] The protests do not provide a basis for relying solely on the generic corporate bond index at a single point in time.

b) Return on Equity

22. Our recommended return on equity (ROE) is developed using data from several sources, including estimates for the return on equity for publicly traded IPPs and other independent studies. Our reliance on multiple sources stems from the lack of directly observable information on the appropriate ROE for individual projects, as opposed to entire corporations. As discussed in our Initial Affidavit, it is inappropriate to use a corporate-level return on equity for the return on equity appropriate for an individual project.

23. The protests raise concerns about the reliability of information from the other independent studies, largely associated with the fact that the studies are not contemporaneous with the estimated return on equity from publicly traded companies.[15] The protests neither offer information that ROE recommended in these studies is not reliable, nor provide alternative sources of information on appropriate ROE values. In fact, these sources provide *independent* assessments of the *project-level* return on equity, which can be informative given the lack of directly-observable information.

24. The protests instead suggest that the return on equity should be lowered so that it "aligns with other IPPs."[16] However, this recommendation fails to recognize the fundamental

[14] *See*, e.*g.*, Analysis Group, "NYISO 2015/2016 ICAP Demand Curve Reset, Financial Parameters" (presented at the June 2, 2016 Installed Capacity Working Group), available at: http://www.nyiso.com/public/webdocs/markets_operations/committees/bic_icapwg/meeting_materials/2016-06-02/AG%20Financial%20Parameters%2006022016%20ICAPWG%20FINAL%20-%205%2022%202016%20(2).pdf. At that time, we noted that the median cost of debt over the preceding 12 month period was 7.75 percent.

[15] NYPSC/NYSERDA Protest at 50-51; and MI/City Protest at 46-47.

[16] NYPSC/NYSERDA Protest at 51; and MI/City Protest at 47.

difference between a *project-level* return on equity and a one for an entire *IPP company*. As discussed in our Initial Affidavit, an appropriate project-level return on equity typically exceeds that for an IPP corporation as a whole because these companies have portfolios of assets that balance and mitigate risks, thus lowering the corporate level return on equity. The protests reflect flawed logic that the project-level return should be the same as the corporate level: "The company cost of capital is not the correct discount rate if the new projects are more or less risky than the firm's existing business."[17]

25. Thus, in our view the protests: (i) fail to provide any new information that we did not review and consider in developing our recommended return on equity; (ii) do not provide accurate critiques of our recommendations; and (iii) do not provide an alternative recommendation for the return on equity.

c) Debt to Equity Ratio

26. The choice of capital structure – that is, the ratio of debt to equity (D/E ratio) – can vary depending on many factors, particularly the nature of the revenue streams (with certain sure revenue streams supporting higher levels of debt), the structure of the project's management and financing, and the nature of the capital supporting the investment. Thus, a merchant peaking plant technology could reasonably be developed through a range of capital structures. We recommend a D/E ratio of 55 percent debt to 45 percent equity given a balance of tradeoffs involved with greater or lesser leverage.

27. The protests point to current ratios of debt-to-equity for entire IPP corporations to suggest that our recommended values are too low.[18] However, the protests' recommendation to rely heavily on the corporate ratio of debt-to-equity again illustrates a failure to recognize the fundamental differences between corporate- and project-level finances. While the higher levels of debt held by IPP corporations informed our view to increase the ratio of debt-to-equity compared to ratios used in past DCRs, it would be inappropriate to use the ratio of debt-to-equity that finances an entire corporate balance sheet with its wide range of

[17] Brealey, Richard, Steward Myers, and Franklin Allen. *Principles of Corporate Finance*, Ninth Edition, McGraw-Hill: New York, p. 239.

[18] NYPSC/NYSERDA Protest at 51-52; and MI/City Protest at 47-48.

financial and physical assets for an individual merchant project in the New York Control Area (NYCA). However, we did note in that several IPPs and other equity analysts have expressed a desire and expectation to deleverage (*i.e.*, reduce debt share) at the company level, which may place pressure to lower debt levels of individual projects.

28. Given the specific circumstances of merchant peaking plant in the NYCA, including the limited fixed revenues streams, our selection of a 55/45 debt to equity ratio if anything appears conservative (*i.e.*, tending to produce a lower WACC than if a more leveraged capital structure were assumed).

V. Conclusion

29. This concludes our supplemental affidavit.

ATTESTATION

I am a witness identified in the foregoing Supplemental Affidavit of Paul J. Hibbard, Dr. Todd Schatzki, and Craig Aubuchon dated December 21, 2016 (the "Supplemental Affidavit"). I have read the Supplemental Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

Paul J. Hibbard
December 21, 2016

Subscribed and sworn to before me
this 21st day of December 2016.

Notary Public

My commission expires: 4/6/23

KATHERINE A. BARBER
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
April 6, 2023

ATTESTATION

I am a witness identified in the foregoing Supplemental Affidavit of Paul J. Hibbard, Dr. Todd Schatzki, and Craig Aubuchon dated December 21, 2016 (the "Supplemental Affidavit"). I have read the Supplemental Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

Dr. Todd Schatzki
December 21, 2016

Subscribed and sworn to before me
this 21st day of December, 2016.

Notary Public

My commission expires: 4/6/23

KATHERINE A. BARBER
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
April 6, 2023

ATTESTATION

I am a witness identified in the foregoing Supplemental Affidavit of Paul J. Hibbard, Dr. Todd Schatzki, and Craig Aubuchon dated December 21, 2016 (the "Supplemental Affidavit"). I have read the Supplemental Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

Craig Aubuchon
December 21, 2016

Subscribed and sworn to before me
this 21st day of December, 2016.

Notary Public

My commission expires: 4/6/23

KATHERINE A. BARBER
Notary Public
COMMONWEALTH OF MASSACHUSETTS
My Commission Expires
April 6, 2023

Attachment II

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

New York Independent System Operator, Inc. **Docket No. ER17-386-000**

SUPPLEMENTAL AFFIDAVIT OF THOMAS A. VIVENZIO

I. Qualifications

1. My name is Thomas A. Vivenzio. I am a Senior Principal Consultant at Lummus Consultants International, Inc. (LCI). My qualifications are described in a previously provided joint affidavit with Dr. William F. Frazier which was included as part of the New York Independent System Operator, Inc.'s (NYISO) November 18, 2016 filing in the above captioned proceeding.[1]

II. Purpose and Summary of Affidavit

2. The purpose of this supplemental affidavit is to respond to certain comments and protests received in response to NYISO's November 18, 2016 filing, which point out that the Siemens 5000F combustion turbine capital estimates prepared by LCI are higher than the estimates developed for the same unit in the last Installed Capacity (ICAP) Demand Curve reset (DCR) and that the capital cost estimates for a GE 7HA.02 combustion turbine prepared by LCI are higher than the capital cost estimate recently prepared for ISO New England, Inc. (ISO-NE) by another consultant.[2]

III. Response to Comments and Protests

3. Capital cost estimates are impacted by plant/project design decisions, site conditions and location. Plant/project design decisions impact cost estimates because they determine what is included in the estimate and identify features and sizing of plant

[1] Docket No. ER17-386-000, *New York Independent System Operator, Inc.*, Proposed ICAP Demand Curves for the 2017/2018 Capability Year and Parameters for Annual Updates for Capability Years 2018/2019, 2019/2020 and 2020/2021 at Attachment IV (November 18, 2016) ("2016 DCR Filing"). Capitalized terms that are not specifically defined in this Supplemental Affidavit shall have the meaning set forth in the filing to which this affidavit is attached or, if not defined therein, the meaning set forth in the NYISO Market Administration and Control Area Services Tariff.

[2] Docket No. ER17-386-000, *supra*, Notice of Intervention and Protest of the New York State Public Service Commission and New York State Energy Research and Development Authority at 53-55 (December 9, 2016); and Docket No. ER17-386-000, *supra*, Motion to Intervene, Comments, and Protest of the New York Utility Intervention Unit at 10-11 (December 9, 2016).

equipment, systems and buildings. Site conditions impact costs of site preparation and foundations. Location affects construction approach, material costs and construction labor costs. In addition, pricing for equipment and bulk materials change with time and market conditions. These factors must be considered in comparing estimates prepared for different projects at different locations and at different times.

4. LCI is part of CB&I and works with the CB&I Fossil Power Group Fossil Estimating Department (Estimating) to develop the estimate of the cost to engineer, procure and construct (EPC) a power plant. LCI provides the plant design information and the latest pricing for major equipment. Estimating provides a complete breakdown of equipment, bulk materials and installation manhours, a breakdown of indirect costs that include engineering, procurement and construction management; and fees. The estimate is for a reference location. For the 5000F and 7HA.02 combustion turbine estimates, LCI obtained the latest pricing for the combustion turbines from General Electric (GE) and Siemens. LCI adjusted the reference location bulk material costs for each New York Control Area (NYCA) location evaluated as part of this DCR and included appropriate taxes. LCI developed construction labor rates and construction productivity factors for each Load Zone, which were used to adjust the reference estimate labor cost. The construction productivity factors were based on power plant construction projects in New York executed by the Shaw Group, which was purchased by CB&I, and from LCI consulting work on power plant projects in New York. Consequently, the plant estimates prepared by LCI are specific to construction of a peaking plant in New York and properly reflect differences in the cost of constructing in each NYCA Load Zone.

5. The direct installed cost of the plant is comprised of the EPC cost of the plant proper plus the electrical interconnection cost and the natural gas interconnection cost. The electrical interconnection cost and the natural gas interconnection costs developed by LCI were higher than the costs from the last reset. LCI is unable to specify the approach and methodology that was used to determine the electric and natural gas interconnection costs in the last reset, however, the cost estimates developed by LCI for this DCR are appropriate and reflect current conditions. LCI used a sound approach to determine these costs. For the electrical interconnection, using transmission line maps, LCI identified the interconnection voltage in each Load Zone. We then prepared a conceptual design for each plant interconnection; sized the major electrical equipment and obtained pricing for each voltage; and developed a complete installed cost estimate for the substation interconnection. Natural gas interconnection costs are dependent on the distance from the plant site to the natural gas pipeline main and the terrain the new natural gas pipeline must cross. Since specific sites in each Load Zone were not identified, an average interconnection length was selected based on a review of recent projects and the installed cost of the pipeline was estimated using an average cost per inch diameter per mile.

6. After the capital cost estimates developed by LCI were presented to the stakeholders during the DCR process, a market participant provided the NYISO and LCI with an estimate for a site specific project in New York City (NYC) which was higher than

the LCI estimate for the NYC ICAP Demand Curve peaking plant. Notably, the project was substantially similar to the peaking plant design proposed for the NYC ICAP Demand Curve in that the project included use of a single, dual fuel Siemens STG6-5000F turbine equipped with selective catalytic reduction (SCR) emissions controls. Although a detailed comparison of the estimates was not undertaken, LCI noted based on a cursory review of the project cost estimate that the site specific project included black start capability,[3] had significantly more liquid fuel storage capacity and a larger site requiring more fill than the LCI design basis for this Load Zone. All of these site and project specific components represent additional costs not reflected in the generic site cost estimate developed by LCI for the NYC ICAP Demand Curve peaking plant. Despite these site-specific and project specific differences, the difference between the cost estimate developed by LCI for the NYC ICAP Demand Curve peaking plant and the specific NYC project are within the expected level of accuracy for these types of estimates.

7. Comparing the LCI GE 7HA.02 cost estimates for the New York Load Zones to an ISO-NE cost estimate prepared by a different company must be done cautiously. Unless the assumptions upon which such estimates are based are identical, such a comparison is not valid or informative. Costs will differ if the plant design; site assumptions; construction approach; electrical and natural gas interconnection design; labor costs and productivity; EPC contractor contingencies, fees and profit are not identical. Costs will also vary depending on the estimating approach utilized. Regardless, LCI has reviewed the ISO-NE cost estimates. Despite the differences, which undermine the validity of comparing these cost estimates to those developed by LCI, LCI believes the cost for Load Zone F would be most relevant for comparison to the cost estimate developed for ISO-NE. The difference between the cost estimates for Load Zone F and the ISO-NE location (*i.e.*, slightly greater than 15%) is within the expected accuracy of these types of estimates.

IV. Conclusion

8. LCI has significant experience in developing power plant cost estimates for utility resource plans and for developers evaluating projects and comparing project alternatives. We follow a consistent approach for preparing these estimates, which we applied in preparing the estimates for this DCR.

9. LCI believes the differences between the estimates prepared for this DCR and the estimates prepared for the last reset are reasonable and within the stated accuracy of estimates of this type.

10. LCI believes that comparison of the GE 7HA.02 cost estimate we prepared for this DCR to a 7HA.02 cost estimate prepared for ISO-NE by a different consultant are not valid unless it can be shown that the assumptions upon which the estimates were

[3] The cost of black start capability was not included in the cost estimates developed by LCI for the NYC ICAP Demand Curve peaking plant because the provision of black start service is recovered through a separate cost-of-service based payment. *See* 2016 DCR Filing, Attachment III at Exhibit D, p. 36.

developed are identical. Furthermore, LCI believes the differences are within the accuracy of estimates of this type.

11. This concludes my supplementary affidavit.

ATTESTATION

I am a witness identified in the foregoing Supplemental Affidavit of Thomas A. Vivenzio dated December 21, 2016 (the "Supplemental Affidavit"). I have read the Supplemental Affidavit and am familiar with its contents. The facts set forth therein are true to the best of my knowledge, information, and belief.

Thomas A. Vivenzio
December 21, 2016

Subscribed and sworn to before me
This 21st day of December 2016.
Notary Public Patricia A. Werskevich

My commission expires: June 24, 2022

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding in accordance with the requirements of Rule 2010 of the Rules of Practice and Procedure, 18 C.F.R. §385.2010.

Dated at Rensselaer, NY this 22nd day of December 2016.

/s/ Joy A. Zimberlin

Joy A. Zimberlin
New York Independent System Operator, Inc.
10 Krey Blvd.
Rensselaer, NY 12144
(518) 356-6207