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June 22, 2021

By Electronic Portal

Hon. Michelle L. Phillips
Secretary to the Commission
New York State Public Service Commission
Empire State Plaza Agency Building 3
Albany, NY 12223-1350

Subject: Case 20-E-0197 - Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act

Dear Secretary Phillips:

Pursuant to the Notice of Proposed Rulemaking published in the March 31, 2021 edition of the New York State Register, enclosed are the comments of the New York Independent System Operator on the Department of Public Service Staff Straw Proposal for Conducting Headroom Assessments and the related discussions held in the Technical Conference on May 13, 2021.

If you have any questions, please call or email me.

Respectfully submitted,

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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.

Dated at Rensselaer, NY this 22nd day of June 2021.

/s/ Joy A. Zimberlin

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 20-E-0197 - Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act.

COMMENTS OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC. ON THE DEPARTMENT OF PUBLIC SERVICE STAFF STRAW PROPOSAL FOR CONDUCTING HEADROOM ASSESSMENTS

Pursuant to the Notice of Proposed Rulemaking published in the New York State Register[1], the New York Independent System Operator, Inc. ("NYISO") respectfully submits these comments to the Public Service Commission ("PSC" or "Commission") in the above-entitled proceeding, on the Department of Public Service Staff ("DPS" or "Staff") Straw Proposal for Conducting Headroom Assessments ("Straw Proposal"). The NYISO's comments also address the related discussions held at the Technical Conference on May 13, 2021 and the June 7, 2021 Addendum to Staff Straw Proposal for Conducting Headroom Assessments.[2] The NYISO is commenting on the Straw Proposal and Addendum to discuss how its planning processes and models can assist Staff and the Commission in identifying the capacity and energy "headroom" that is available on bulk and local transmission facilities. The NYISO urges the Staff and the Commission to utilize its modeling and analysis capabilities[3] to facilitate implementation of the Climate Leadership and Community Protection Act ("CLCPA") and the Accelerated Renewable Energy Growth and Community Benefit Act ("AREA" or "Act").[4]

[1] Proposed Rulemaking, Headroom Analyses of Local Transmission and Distribution System to Support Additional Renewable Energy Generation, I.D. No. PSC-13-21-00021-P (March 31, 2021).

[2] Case 20-E-0197, Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act, *Notice of Technical Conference* (April 21, 2021); *id.*, *Addendum to Staff Straw Proposal for Conducting Headroom Assessments,* DPS Staff, the Brattle Group and Pterra (June 7, 2021).

[3] *See* OATT § 3.8.1 (regarding the NYISO conducting modeling for the NYPSC).

[4] Chapter 58 (Part JJJ) of the laws of 2020.

BACKGROUND

1. Procedural History.

The AREA directs the Commission to take actions to ensure that New York's electric power grid will support the state's CLCPA mandates.[5] The Act calls for the PSC to "commence a proceeding to establish a bulk transmission investment program . . . that identifies bulk transmission system investments that the commission determines are necessary or appropriate to achieve the CLCPA targets (the state 'bulk transmission investment plan')."[6] The PSC will "establish a prioritized schedule for implementation of the state bulk transmission investment plan, and in particular shall identify projects which shall be completed expeditiously to meet the CLCPA targets."[7]

The AREA calls on the DPS to "undertake a comprehensive study for the purpose of identifying distribution upgrades, local transmission upgrades, and bulk transmission investments that are necessary or appropriate to facilitate the timely achievement of the CLCPA targets."[8] The law provides that the study "shall … separately address needed bulk transmission system investments."[9] The AREA states that the DPS will conduct the power grid study in consultation with the New York State Energy Research and Development Authority ("NYSERDA"), the New York Power Authority ("NYPA"), the Long Island Power Authority ("LIPA"), the NYISO, and the Utilities.[10] The NYISO previously commented in this proceeding

[5] 2019 Laws of New York, ch. 106. The CLCPA requires that: (i) seventy percent of energy consumed in New York State be produced by renewable resources by 2030; (ii) by 2040 electricity consumed must be emissions free; and (iii) the state's jurisdictional load serving entities must procure at least nine gigawatts of offshore wind electricity generation by 2035, six gigawatts of photovoltaic solar generation by 2025, and support three gigawatts of statewide energy storage capacity by 2030.

[6] AREA at §7(4).

[7] *Id.*

[8] AREA, at § 7(2).

[9] *Id.*

[10] *Id.*

on; (1) the criteria for determining priority transmission projects to be developed by NYPA and transmission needs to be addressed in the NYISO's Public Policy Transmission Planning Process ("PPTPP"),[11] and (2) on the Initial Report on the New York Power Grid Study and the related questions posed by Staff.[12] In its prior comments, the NYISO reviewed its Public Policy Process and Economic Planning Process and how its planning processes and models can be utilized by the DPS and the PSC.[13]

2. Staff Straw Proposal and NYISO Role.

On March 16, 2021, the DPS filed in this proceeding a Straw Proposal for Conducting Headroom Assessments, and held a technical conference on the Straw Proposal on May 13, 2021. The proposal outlines possible improvements to the methodologies and assumptions used by the state's electric utilities when analyzing the amount of "headroom" that is available on local transmission and distribution facilities. Such headroom represents the projected capability of the local transmission and distribution systems to support additional renewable energy generation, for the purpose of meeting the requirements of the CLCPA and determining the need for potential electric system upgrades and new facilities.

The Straw Proposal would apply to "local transmission" facilities that "generally serve local load, and transmission lines which transfer power to other utility service areas and operate at less than 200 kV."[14] It would quantify "headroom" on transmission lines in terms of the

[11] Case 20-E-0197, Comments of the New York Independent System Operator, Inc. on Petition Requesting Adopt of Criteria for Guiding Evaluation Whether a Bulk Transmission Investment Should be Designated as a Priority Transmission Project (September 14, 2020), available at: https://www.nyiso.com/documents/20142/10601510/20200914NYISOCmmntsDPS-NYPACrtriaPrrtyPrjcts-complete.pdf/922085d6-271d-6a8e-19fd-744e2b5ec4c5

[12] *Id.,* Comments of the New York Independent System Operator, Inc. on Initial Report on the Power Grid Study and Department of Public Service Questions (March 22, 2021).

[13] Capitalized terms are defined by the NYISO's Open Access Transmission Tariff ("OATT"), Market Administration and Control Area Services Tariff ("MST") and Manuals, and in this proceeding.

[14] Straw Proposal, at 1.

capability of existing facilities and the incremental capability of new investments to support the capacity and energy output of renewable generation that is added to the system. The Straw Proposal states: "Existing and incremental renewable energy headroom, in this respect, is the MWh amount of additional renewable generation that can be supported without curtailment by the existing grid and incrementally after a upgrade project is placed into service."[15]

Regarding process, the Straw Proposal calls for unified planning data and models with collaboration among utilities to produce a unified and shared database of study assumptions and set of power flow models. It states that "[t]he improved study assumptions and power flow models would also provide [a] more accurate and consistent basis for other studies that apply to headroom, such as production cost simulation by the utilities and NYISO."[16] The Straw Proposal further states that:

> This endeavor should use the NYISO power system models as the starting point to build more detailed statewide representations. This more global NYISO-wide perspective is particularly important for portions of the system in which two or more utility systems heavily intertwine and are interdependent, and/or where local systems interact more closely with the bulk power system.[17]

Finally, the Straw Proposal states that planning models should reflect likely renewable development locations from a combination of known sources, including the NYISO interconnection queue, utility interconnection requests and state planning and renewable procurements.[18]

[15] *Id.,* at p. 2.
[16] *Id.,* at p. 3.
[17] *Id.*
[18] *Id.*

COMMENTS

I. The PSC Should Leverage the NYISO's Comprehensive System Planning Process to Assist Planning for Local Transmission Facilities.

Achieving New York's public policy objectives will require additional transmission capacity to interconnect and deliver renewable resources to consumers. The NYISO appreciates the Staff's efforts in defining a uniform method for the Transmission Owners to identify high-priority and high-value locations for targeted non-bulk transmission development. As stated in the NYISO's comments on the Power Grid Study on March 22, 2021, further coordination between the individual Transmission Owners' planning processes and the NYISO's planning process would assist the state in achieving the CLCPA mandates. Using a consistent headroom calculation methodology among the Transmission Owners within their local planning processes would provide comparable assessments statewide and among different utility service territories and enable Transmission Owners, policymakers, developers, and other stakeholders to make better informed decisions with regard to system planning as a whole.

The NYISO's Comprehensive System Planning Process ("CSPP") is comprised of the following elements; the Local Transmission Owner Planning Process, Reliability Planning Process, Economic Planning Process, Public Policy Transmission Planning Process, and inter-regional transmission planning, which is conducted with neighboring control areas in the United States and Canada. Through the CSPP, the NYISO will now issue reports, at least annually, informing policymakers and investors on the state of the New York transmission system through publication of the System & Resource Outlook ("Outlook"), the Reliability Needs Assessment, and the Comprehensive Reliability Plan, all of which are informed first by the Local Transmission Owner Planning Process ("LTPP").

The LTPP is a major component of the CSPP. The NYISO and the Transmission Owners have historically worked together, sharing their planning responsibilities. The Transmission Owners are responsible for planning their local transmission systems for their transmission districts and developing their respective Local Transmission Plans ("LTPs"), while the NYISO has the responsibility to plan for the Bulk Power Transmission Facilities for the New York Control Area.

The LTPP includes procedures for the identification of transmission needs driven by Public Policy Requirements in LTPs and for the consideration of solutions to such needs. Each Transmission Owner, after considering input provided by the DPS, and any information provided by a Market Participant or other interested party, will determine whether there are transmission needs driven by a Public Policy Requirement for which local transmission solutions should be evaluated. Each Transmission Owner will evaluate solutions to identified transmission needs, including transmission solutions proposed by Market Participants and other interested parties for inclusion in its LTP. The Transmission Owner, in consultation with the DPS, will evaluate proposed transmission solutions on its local system to determine the more efficient or cost-effective transmission solutions. Any local solution identified by a Transmission Owner to address a Public Policy Requirement will be reviewed with stakeholders.[19]

The Transmission Owners are required to present their draft LTPs, planning criteria and assumptions, and a list of applicable software and/or analytical tools for comments in the NYISO stakeholder process.[20] The Transmission Owners will consider stakeholder comments on their draft LTPs and planning criteria before they are finalized,[21] and the Transmission Owners'

[19] NYISO Open Access Transmission Tariff ("OATT") § 31.2.1.1.2.
[20] NYISO Open Access Transmission Tariff ("OATT") § 31.2.1.1.
[21] NYISO Open Access Transmission Tariff ("OATT") § 31.2.1.2.

updated LTPs are posted on the NYISO's website. This information feeds into the compilation of the annual Load and Capacity Data report ("Gold Book"), and forms the basis of the system models that the NYISO uses to conduct all of its transmission system planning studies.

The foundation of the CSPP is a unified planning model for the New York State Transmission System. Transmission Owners actively participate in all elements and are responsible for compiling the system representation for their service territories. The models include all system transmission facilities from 765 kV and can include distribution facilities down to 11 kV. A similar concept is observed in the context of the Straw Proposal, namely a unified planning model that expands the details in local transmission and distribution. Particularly for the areas that are served by multiple Transmission Owners, a unified model can be very useful to comprehensively plan for the local transmission and distribution system. To make the models more useful, auxiliary files enabling accurate simulations of local contingencies and post-contingency operating procedures are equally as important, and should be made available to interested parties with proper procedures and safeguards to protect Confidential Information and Critical Energy Infrastructure Information.

Starting this year, utilizing the unified planning models with input from the Transmission Owners via the LTPP, the NYISO will conduct a statewide analysis of transmission system congestion and performance over a 20-year period in the Economic Planning Process, and report the analysis in the Outlook. The new energy deliverability metric,[22] as part of the Outlook, will provide insights into the ability of resources to deliver their full energy capability to the entire New York State transmission system and the conditions that lead to any curtailment.

[22] OATT § 31.3.

The energy deliverability results can be reported in various ways to deliver meaningful information. Resources can be reported in groupings (*e.g.,* within constrained renewable generation pockets) or individually to the appropriate stakeholders. The energy deliverability metric may be expressed as a percentage of such total amount of energy or as the amount of curtailed energy. Applying the assessment to renewable generators, the transmission constraints and the need for transmission expansion can be identified efficiently by analyzing the congestion and curtailments associated with these generators.

Last year, the NYISO deployed its new energy deliverability analysis using power flow and production cost simulation analyses to identify renewable generation pockets in New York State.[23] The NYISO modeled a set of assumed 2030 conditions with 70 percent renewable energy its last Economic Planning Process study.[24] The model produced detailed results demonstrating that, absent additional transmission, renewable generation pockets are likely to develop throughout the New York State transmission system as the existing grid becomes overwhelmed by significant renewable capacity additions across the state.

II. Temporal Production Cost Simulations Provide a More Robust Solution than Power Flow Screening Alone.

To examine energy headroom, the Straw Proposal primarily focuses on developing power flow models, including detailed representations of bulk power and local transmission and distribution facilities and constraints, and additionally considers expanding into production cost simulation models. To assist the state in finalizing the methodology for calculating headroom on both bulk and local transmission facilities, the NYISO offers the following assessment of power

[23] Renewable generation pockets are areas containing more renewable energy production than can be delivered with the existing transmission system.

[24] *See* https://www.nyiso.com/documents/20142/2226108/2019-CARIS-Phase1-Report-Final.pdf/bcf0ab1a-eac2-0cc3-a2d6-6f374309e961

flow screening methods compared to production cost simulation tools that can be used to estimate energy headroom for bulk transmission facilities.

The proposed methodology to calculate headroom employs power flow analysis to identify the most limiting transmission system elements based on selected hours to represent certain system conditions. This modeling technique can be useful to avoid overloading the most limiting system elements during stressed system conditions, such as at system peak, and during shoulder and light load periods. Each simulation can identify flow patterns on the transmission system and areas where renewables cannot fully dispatch due to thermal limitations, resulting in curtailment. Moreover, this type of steady-state analysis can be performed quickly and, by analyzing multiple potential network conditions, transmission facilities that have a high potential to unbottle generation can be identified if the same constrained elements appear in multiple network conditions.

Nevertheless, a headroom modeling technique that relies on snapshots in time has significant limitations that render its results suboptimal. The most limiting transmission element identified in the power flow methodology may not necessarily be the most congested element in production cost simulations. By its nature, selecting representative hours does not fully capture the multitude of dispatch scenarios that occur on the system over weeks, months, and years into the future. Such analyses must be supplemented to properly assess the temporal challenges that will drive the extensive infrastructure buildout expected in the next few decades.

In comparison, production cost simulations can be performed to identify the hour-by-hour operation of a power system and energy market over 8,760 hours per year, and over a multi-year timeframe, potentially up to a 30-year horizon. Production cost models include a detailed representation of generation, load, and the transmission system, and incorporate forecasted

parameters such as fuel prices, load growth, and emissions prices. The underlying software uses an optimization program to economically commit and dispatch generation to meet load while securely transferring power throughout the transmission system. The simulation mimics how ISOs/RTOs' day-ahead and real-time energy market clearing engines work.

Power flow simulations capture system conditions for instances in time, and are ideal to provide screening analyses. Production cost models that can capture the dynamic system conditions occurring in the system today and in the future are ideal to provide details through the entire study period. The NYISO has found that analyses aimed at identifying the multitude of transmission constraints and potential flow patterns, and that account for realistic generator commitment and dispatch scenarios, are best performed with a combination of power flow and production cost techniques. Simply modeling several potential power flow conditions and temporally extrapolating results can lead to over/under estimation of actual headroom under baseline and project conditions. To account for realistic operating conditions, a production cost model must be employed. The new energy deliverability metric within the Economic Planning Process will provide insights into the ability of resources to deliver their full energy capability to the system and the conditions that lead to any curtailment.

To analyze energy deliverability, the NYISO starts with power flow analyses that form the basis of system topologies for transmission statewide, including different types of transfer limits and constraints. Then, using production cost simulation tools, the NYISO conducts an 8,760-hour assessment to calculate the amount of energy that can actually be produced and consumed over a given year, rather than a snapshot in time. This energy deliverability analysis quantifies the amounts of energy that would be produced by each resource considering the impact of transmission constraints, as compared to the total amount of energy that such resource

is capable of producing in the absence of transmission constraints, while accounting for fuel availability of each resource type, including wind, solar, and water.

Historically, potentially limiting constraints had to be identified prior to the production cost simulation models to capture the impact on congestion from these elements during the simulations. To resolve this modeling limitation, as part of the 2019 CARIS 70x30 Scenario the NYISO developed a "round-trip" analysis process that leverages both the transmission constraint identification features of the Transmission Adequacy and Reliability Assessment ("TARA") software optimal transfer power flow analysis, and the market operations-based generator schedule and dispatch features of the Multi Area Production Simulation Software ("MAPS") production cost tool.[25] The iterative process identifies and models both bulk and local transmission constraints under the dynamic system conditions arising from the changing New York resource mix through time. The impact from transmission constraints can now be better captured through the use of these tools with the unified system model in the NYISO CSPP.

III. Headroom Methodology Addendum.

On June 8, 2021, Staff filed an addendum document detailing energy headroom calculations, which it drafted with its consultants the Brattle Group and Pterra, titled "Addendum to Staff Straw Proposal for Conducting Energy Headroom Assessments" ("Addendum"). The NYISO respectfully disagrees with several statements made in the Addendum. It states that "the [Production Cost Model] PCM result do not indicate how much headroom remains available beyond the uncurtailed renewable energy production."[26] Production cost simulations have the

[25] See slide #7 for process diagram: https://www.nyiso.com/documents/20142/12126107/04%202019CARIS1_70x30Scenario.pdf/571b6ba5-69d3-d25f-9c5b-cb2822c0ab82

[26] Staff Addendum, at p. 3.

ability to capture hourly generation output and transmission flows, including post-contingency transmission flows. For uncurtailed hours, one can compare generator dispatch levels and transmission path flows with consideration of generator shift factors ("GSFs") to calculate an energy headroom value. It is important to note that, in the NYISO's production cost model, a transmission constraint does not have to be active to calculate the pre- or post-contingency flows. In addition, as part of the System & Resource Outlook, the NYISO performs simulations under "relaxed" constraint conditions. This methodology provides for the calculation of incremental energy headroom calculations.

The Addendum document also references the Utility Report statement that "while PCM is a powerful tool, it requires complex, expensive software, and specialized training. PCM results are highly dependent upon study assumptions, and results can give a false sense of precision when compared to other methods."[27] There are several production cost simulation tools commercially available through numerous vendors with ready-to-simulate databases, similar to power flow tools. Additionally, through the NYISO's Requested Economic Planning Study ("REPS") process, any interested party can request a production cost study to be performed, on their behalf, to calculate energy headroom metrics.[28] Like any grid simulation tool, all results are highly dependent upon input assumptions. Production cost methods provide the appropriate level of precision for energy headroom calculations as they can truly calculate energy (MWh) metrics. By comparison, power flow methods calculate instantaneous power (MW) metrics, which are then crudely extrapolated to estimate energy (MWh) metrics. As described in detail in Point II, the NYISO generally supports the calculation of an energy headroom metric, but urges Staff and the PSC to adopt a methodology that captures the dynamic hourly system conditions.

[27] Addendum, at p. 4.
[28] OATT § 31.3.3.

IV. Integrating the Proposed Headroom Calculation with the NYISO's Economic Planning Analyses and Tools Will Provide the Most Insight into Achieving a High Renewable Generation Future in New York.

The NYISO's expanded Economic Planning Process is ideally suited to work with the proposed headroom calculation process. The System & Resource Outlook will identify statewide renewable generation pockets and evaluate associated energy deliverability, while Transmission Owners examine the headroom in their local transmission and distribution systems. Interested parties such as a policymakers, transmission developers, and generator developers can use the combination of information to examine the system from statewide to local levels when screening for favorable interconnection points or transmission expansion opportunities. The combination of information can help minimize needed transmission infrastructure additions while maximizing renewable generation outputs. It could also be used to identify additional Public Policy Transmission Needs that could be addressed in the Public Policy Process.

Once the system screening analysis is completed and a specific generation or transmission project needs to be analyzed, interested parties can request a longer-term Requested Economic Planning Study ("REPS") that includes analysis of the energy deliverability of their proposed transmission or generation projects over a twenty-year period.[29] For example, NYSERDA, when considering REC awards, could use this study to determine if a proposed renewable generation project can deliver the energy as expected and without experiencing curtailment. Generator or transmission developers also could request this study to fully understand the impact to energy deliverability from a proposed project.

[29] The NYISO proposed to incorporate the study requirement for the REPS into a new § 31.3.3 of the OATT and to incorporate the request and agreement forms into the tariff into new §§ 31.13 and 31.14. The NYISO's proposed tariff changes are available at: https://www.nyiso.com/regulatory-viewer

As stated in Point I above, the NYISO and the Transmission Owners have a mandate to work together in sharing and coordinating their planning responsibilities. With a uniform headroom calculation methodology there is an opportunity to further enhance this shared responsibility. Specifically, the NYISO's modeling tools can better assess the system constraints in a statewide model with the Transmission Owners' cooperation in the "round-trip" modeling process to provide an accurate representation of the complexities of the local transmission systems. The constraints on the bulk transmission facilities are usually well understood and fully captured, while the impacts from constraints on the local transmission systems have yet to be fully represented in a statewide model.

By combining the Transmission Owners' expertise in power flow modeling on their respective local systems with the NYISO's production cost simulation capabilities, the energy headroom on the bulk and local transmission system in New York State can be more accurately calculated. The NYISO is coordinating with the Transmission Owners to better enhance this modeling process in 2021, and will continue to advance this analysis in order to provide better insight into New York's high renewable resources future. In sum, the Transmission Owners' headroom calculations for their local transmission and distribution systems, in combination with the NYISO's statewide energy deliverability tools in System & Resource Outlook, can be a new and powerful combination that the DPS and PSC should utilize to facilitate achievement of the state's CLCPA mandates.

V. The PSC Should Issue Clear Directives on Headroom Modeling and Posting Data for Transmission System Capacity and Energy Deliverability Using the Methodology it Approves.

The NYISO appreciates Staff's efforts to define a uniform method to identify high-priority and high-value locations for targeted transmission and distribution development. Using a consistent calculation methodology among the New York Transmission Owners would provide

comparable assessments across multiple service territories, which would enable policymakers, renewable generation developers, and other stakeholders to make better informed decisions. The NYISO encourages the PSC to issue clear directives on headroom calculation methodology that it approves, and publish informational guidelines for interested parties to better utilize the resulting methodology. Developers proposing projects and policymakers tracking progress toward New York energy policy requirements will benefit from a clear understanding of various aspects such as the assumptions, modeling, interpretation of the headroom results, and where to direct questions should they arise. The PSC should also consider publishing the resulting headroom among all transmission owners in a central location, and requiring and publishing updates to the headroom data.

VI. The Commission Should Distinguish the Use of the Term "Headroom" in the Context of Renewable Energy Deliverability from the "Headroom" in the NYISO's Interconnection Process.

The DPS Staff proposal outlines possible improvements to the methodologies and assumptions used by the state's electric utilities when analyzing "headroom." It uses the term "headroom" to denote the projected capability of the local transmission and distribution systems to support additional renewable energy generation, for purposes of evaluating the CLCPA benefits of potential system upgrades. The NYISO has no objection to use of the term "headroom" in this context, but respectfully requests that in any final Commission document adopting this proposal, the Commission distinguish the term "headroom" in the context of renewable energy deliverability from the term "headroom" in the NYISO's interconnection process.

Attachment S of the NYISO OATT establishes a "Headroom" mechanism pursuant to which a Developer may recover the costs of certain System Upgrade Facilities and System Deliverability Upgrades that other Developers use. Under the Headroom requirements, if a

Developer pays for upgrades that create functional or electrical capacity on the electric system in excess of that needed for the Developer's project, then the Developer may be reimbursed by a subsequent Developer for their use of the excess capacity of the upgrades, to the extent the Headroom meets the electrical or functional Headroom requirements of Attachment S.[30]

CONCLUSION

For the foregoing reasons, the NYISO respectfully requests that the DPS and the PSC consider its comments on Staff's headroom calculation proposal and direct the NYISO to employ its power flow and production cost modeling tools to conduct energy deliverability modeling for the New York State bulk and local transmission systems.

Respectfully submitted,

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Dated: June 22, 2021

[30] *See, e.g.,* OATT, Att. S Sections 25.1.2 (definition "Headroom"); 25.8.7. Such Headroom can be created by a Developer that elects to construct System Upgrade Facilities that are larger or more extensive than the minimum facilities required to reliably interconnect its proposed project ("Elective System Upgrade Facilities"). *See* OATT, Att. S Section 25.6.1.4.1. A Developer can construct Elective System Upgrade Facilities as long as they are reasonably related to the interconnection of the proposed project. *Id*. Headroom can also result when the electrical capacity of a System Deliverability Upgrade is in excess of what is required for Developer's requested level of Capacity Resource Interconnection Service for its project. *See* OATT, Att. S Sections 25.7.2.1, 25.7.2.2, 25.7.12.6. In addition, Headroom can result simply from the fact that commercially available facilities may be somewhat larger than what is required for a particular project, to the extent the headroom meets the electrical or functional Headroom requirements of Attachment S. If a Developer of a later project uses the Headroom created and paid for by the earlier Developer, the later Developer must pay the original Developer for this Headroom in accordance with specific Headroom reimbursement rules. *See* OATT, Att. S Section 25.8.7.