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 COMPLIANCE REPORT BY ELECTRIC UTILITIES ON DEVELOPING DISTRIBUTION AND LOCAL TRANSMISSION IN RESPONSE TO STATE CLIMATE CHANGE LAWS, AND ON TECHNICAL CONSULTANTS' STUDIES

Pursuant to the Notice of Proposed Rulemaking published November 18, 2020 in the State Register,[1] the New York Independent System Operator, Inc. ("NYISO") respectfully submits these comments on the Utilities' Local Transmission and Distribution Report filed by electric utilities[2] in compliance with the May 14, 2020 Order ("May Order") on Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act[3] ("AREGCBA" or "Act") issued by the New York State Public Service Commission ("PSC" or "Commission"). The NYISO is commenting on the Utilities' Local Transmission and Distribution Report to discuss the need for transmission expansion for the purpose of compliance with the Act for the Commission's consideration in this proceeding and in implementing the Act. In addition, the NYISO respectfully submits these comments in response to the Notice of Technical Conference and presentations filed in this proceeding by the New York Department of Public Service ("DPS") and the New York State Energy Research and Development Authority

[1] 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 Proposed Rulemaking, NYS Register, I.D. No. PSC-46-20-00008-P, November 18, 2020, at 16-17.

[2] The Utility Transmission and Distribution Investment Working Group Report (dated November 2, 2020) ("Report") was filed by Central Hudson Gas & Electric Corp., Consolidated Edison Company of New York, Inc., Long Island Power Authority, Niagara Mohawk Power Corporation d/b/a National Grid, New York State Electric & Gas Corporation, Orange & Rockland Utilities, Inc., and Rochester Gas and Electric Corporation ("the Utilities").

[3] 2020 Laws of N.Y. Ch. 58, Part JJJ.

("NYSERDA") on studies conducted by technical consultants on New York's bulk power transmission system needs to integrate and deliver offshore wind energy to consumers. The NYISO provides these comments on the technical consultants' presentations in order to provide input on key factors that may drive the need for bulk transmission expansion for consideration in further studies.

BACKGROUND

The AREGCBA directs the Commission to take actions to provide that New York's electric grid will support the state's Climate Leadership and Climate Protection Act ("CLCPA") mandates.[4] 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')."[5] 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."[6]

The Act provides that:

> The commission shall utilize the state grid operator's public policy transmission planning process to select a project necessary for implementation of the state bulk transmission investment plan, and shall identify such projects no later than eight months following a notice of the state grid operator's public policy transmission planning process cycle, except that for those projects for which the commission determines there is a need to proceed expeditiously to promote the state's public policy goals, such projects shall be designated and proceed in accordance with subdivision five of this section.[7]

[4] 2019 Laws of New York, ch. 106. The CLCPA requires that seventy percent of energy consumed in New York State be produced by renewable resources by 2030. By 2040 energy consumed must be completely emissions free.

[5] *Id.* at §7(4).

[6] *Id.*

[7] *Id.*

The Act authorizes the New York Power Authority ("NYPA") to undertake the development of such bulk transmission investments, on its own or in partnership with others, found by the Commission to be needed expeditiously to achieve CLCPA targets.[8] On July 2, 2020, the DPS and NYPA filed a petition requesting that the Commission adopt criteria to use in evaluating and prioritizing transmission needs, and determining which bulk transmission investments qualify as priority projects to be developed by NYPA under the Act.[9]

On October 15, 2020, the Commission issued an Order on Priority Transmission Projects that adopted some of the proposed criteria for designating priority transmission projects and designated the Northern New York transmission projects for development by NYPA.[10]

On November 2, 2020, the Utilities filed the Utility Transmission and Distribution Investment Working Group Report which, as noted above, was noticed for public comment in the State Register. On November 5, 2020, the DPS and NYSERDA issued a Notice of Technical Conference in this proceeding to address certain studies that "form the basis of establishing New York's bulk transmission investment plan and the local transmission plans of the New York utilities."[11] On November 23, 2020, the DPS and NYSERDA convened a technical conference that included presentations on the Power Grid Study that is comprised of three components: (i) Utility Local Transmission Studies, presented by electric utilities, (ii) New York Offshore Wind

[8] *Id.* at § 5.

[9] NYPSC Case No. 20-E-0197, *Proceeding on Motion of the Commission to Implement Transmission Planning Pursuant to the Accelerated Renewable Energy Growth and Community Benefit Act*, Petition Requesting Adoption of Criteria for Guiding Evaluation of Whether a Bulk Transmission Investment Should Be Designated as a Priority Transmission Project, and for Designation of Certain Transmission Investments in Northern New York as a Priority Transmission Project (July 2, 2020).

[10] *Id.*, Order on Priority Transmission Projects (October 15, 2020).

[11] *Id.*, Notice of Technical Conference (November 5, 2020).

Integration Study, presented by DNV-GL, PowerGEM, and WSP, and iii) Zero-Emission Electric Grid in New York by 2040, presented by Siemens.[12]

The NYISO offers comments in this proceeding to emphasize:

(i) the importance of additional transmission infrastructure to meet the state's climate change policy objectives;

(ii) the factors contributing to the need for bulk transmission expansion to achieve the state's climate change policy objectives; and

(iii) the value of the NYISO's Public Policy Process to solicit, evaluate and select efficient and cost effective bulk transmission solutions eligible for cost allocation and recovery through its tariffs.

The NYISO appreciates the extensive efforts by the DPS, NYSERDA, and the Utilities in conducting the Power Grid Study. As part of this filing, the NYISO's comments on the New York Offshore Wind Integration Study and the Zero-Emission Electric Grid in New York by 2040 are based on the discussions and interim results released at the Technical Conference, and will be further refined when the Commission seeks public comments on its bulk power system Power Grid Study.[13] Considering the impacts of these study findings on the Commission's decisions on transmission system investments in this proceeding, we encourage the NYSERDA and the DPS to provide details such as study methodology and assumptions as part of the final report.

[12] On November 24, 2020, the DPS and NYSERDA submitted the presentations as part of the record in this proceeding.

[13] The NYISO understands that the Commission will issue a draft bulk power system study for public comment under the State Administrative Procedure Act.

COMMENTS

I. To Meet the State's Climate Change Targets, Renewable Resources Will Likely Be Developed in Regions Where Transmission Expansion Will Be Necessary.

The bulk power system envisioned in the state's climate change laws will likely operate under a very different set of resources and demands. Rather than relying on traditional fossil-fueled generating units to meet the electricity demand, new renewable generating units will need to be interconnected throughout the New York Control Area ("NYCA") to provide emission-free power. Due to the availability of the solar and wind natural resources that serve as the "fuel" for renewables, and driven by the need for large real estate footprints to accommodate them, renewable resources have different siting and sizing considerations when compared to traditional fossil-fueled generation.

These natural resources and the land needed to site renewable resources tend to be in the northern and western regions of upstate New York State, including the Southern Tier, and off the coasts of New York City and Long Island. As a result, renewable generation investments will necessarily concentrate in certain geographic areas where bulk transmission facility expansion will be required in order to deliver the renewable energy to consumers, as confirmed by NYSERDA awards of renewable energy credits (RECs) to date.[14]

The NYISO Interconnection Queue also indicates where developers are considering siting within New York State. Based on the NYISO Interconnection Queue as of Nov. 30 2020,[15] over 90% of the land-based renewable capacity outside of New York City and Long Island is located in NYISO Zones A through E, and less than 10% is located in Zones F and G. Those

[14] Recent land-based awards, such as 18 out of the 21 large-scale renewable energy projects awarded in the 2020 solicitation and 18 out of the 20 projects awarded in the 2019 solicitation, are located in the upstate regions mentioned above.

[15] NYISO Interconnection Queue is available at the following link: https://www.nyiso.com/interconnections

areas in Zones A through E are mostly remote from New York's existing bulk power transmission facilities.

A. The NYISO's "70 by 30" Analysis Demonstrates the Need for Transmission Infrastructure to Deliver Energy from Generation Pockets to Consumers Statewide

The NYISO has conducted assessments to provide insights into renewable generation pockets that are likely to form in upstate New York due to limited transmission capability in the areas where wind and solar resources are likely to be constructed. These renewable generation pockets are regions in the state where renewable generation resources cannot be fully delivered to consumers statewide due to transmission constraints.

When generation exceeds the transmission limits and load within a pocket in a given hour, the generation output must be reduced, or "curtailed." Curtailments result from the hourly balancing of generation and load subject to transmission constraints. For any given hour, the output of a wind or solar plant may range from fully curtailed (zero output) to full output. Curtailment of existing wind generators is already observed in New York, in certain months as high as 3%.[16]

Without additional transmission expansion, the curtailment is expected to increase in the future as more renewable resources interconnect to the system. The NYISO's 2019 Congestion Assessment and Resource Integration Study ("CARIS"),[17] released in July 2020, provides key insights into the potential value of additional transmission capability across the NYCA.[18] The

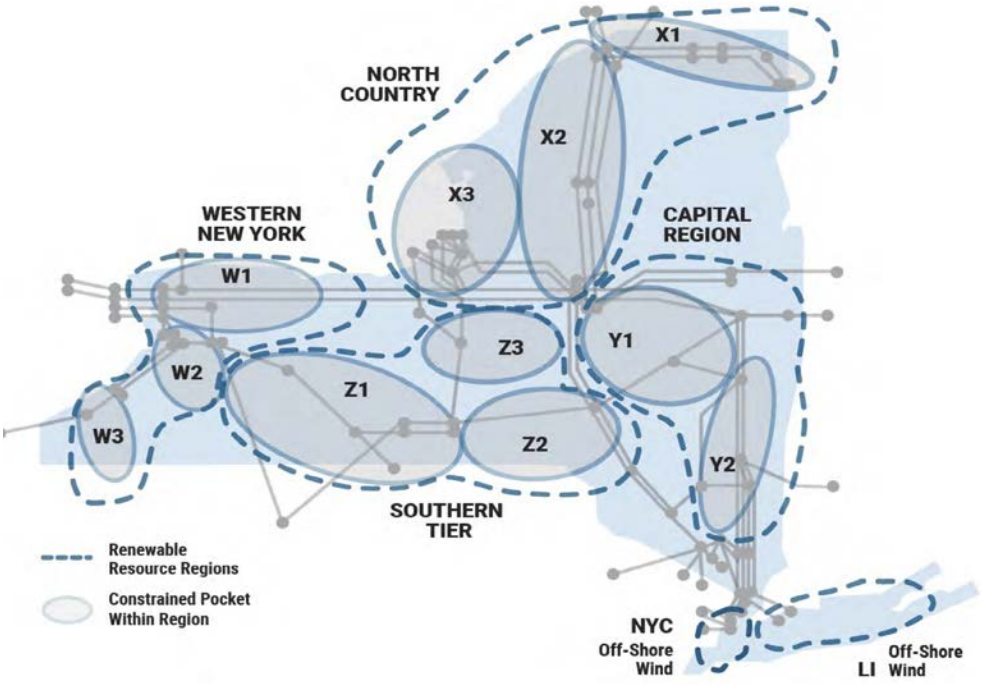
[16] November 2020 Monthly Operations Report, at slide 10. The document is available at the following link: https://www.nyiso.com/documents/20142/17478687/03_Operations_Report_202011_v1.pdf/ada0989d-8540-bfbb-d487-537bc52fa0e8

[17] The 2019 CARIS Report, Congestion Assessment and Resource Integration Study (July 2020) is included as Attachment I to these comments.

[18] The 2019 CARIS report is available at the following link: https://www.nyiso.com/documents/20142/2226108/2019-CARIS-Phase1-Report-Final.pdf/bcf0ab1a-eac2-0cc3-a2d6-6f374309e961?t=1595619194867. The NYISO is submitting the 2019 CARIS Study for the Commission's consideration as part of the record in this proceeding.

CARIS study assessed projected congestion patterns in the NYCA under several scenarios; the most informative of which was the 70 by 30 Scenario representing the CLCPA target of 70% renewable energy by 2030. In the 70 by 30 Scenario simulations, approximately 11% of the annual total potential renewable energy production would be curtailed across the New York system.[19]

The assessment shows that renewable generation pockets will likely result from both the existing renewable resources and the large amount of expected additional wind and solar resources. This supports the conclusion that additional transmission expansion, at both bulk and local levels, will be necessary to efficiently deliver renewable power to New York consumers. The figure below depicts the generation pockets from the NYISO's 70 by 30 Scenario:



CARIS Renewable Generation Pockets Map

[19] 2019 CARIS report, at 91.

B. Review of Utilities' Local Transmission and Distribution Capital Plans Should Holistically Consider Interactions Among The Plans

In recognition of the renewable generation pockets identified in the CARIS report, the Utilities utilized the NYISO's assessment as a starting point for more focused and detailed assessments of the Utilities' local systems in the Local Transmission and Distribution Report.[20] The resulting Utilities' Report contains proposals and recommendations in fulfilment of the requirements of the May Order to address the need for local transmission and distribution needs. The Utilities appropriately establish project investment criteria and prioritization recommendations, as well as identify candidate projects for transmission expansion within their respective service territories. The Utilities should identify the projects they consider firm as part of their Local Transmission Owner Plan within the NYISO's Comprehensive System Planning Process. Consistent with its base case inclusion rules and other planning procedures, the NYISO will incorporate these facilities into its planning processes when planning for the bulk transmission system. These projects will also require evaluation in the NYISO's transmission expansion process if the modification or expansion results in an impact to the system that exceeds the established thresholds in the NYISO's tariff.[21]

The projects identified are likely an effective first step in addressing some level of anticipated local renewable curtailments, but the Commission's consideration of the Utilities' proposed local transmission and distribution capital plans should also go beyond the individual Utilities' service territories. To meet the requirements of the state's climate change laws, the PSC should holistically consider the interactions among the proposed projects as they relate to addressing the transmission-constrained generation pockets identified in the CARIS report.

[20] Utilities Local Transmission and Distribution Report, at 74.
[21] *See generally*, OATT §§ 3.7.1; 22.3; NYISO Transmission Expansion and Interconnection Manual § 2.

In 2020, the NYISO and its consultants conducted the Climate Change Impact and Resilience Study ("Climate Change Study")[22] to identify potential system impacts as the state moves to an emission-free electric grid in 2040. The Climate Change Study confirmed that additional transmission capability is necessary to alleviate constraints on the system and maximize the potential contribution of the renewable resources. As discussed above, the distribution of renewable resources across New York is heavily weighted to the upstate region due to land availability and ease of siting. As a result, the significant addition of renewable resources required to meet 100 percent emission-free grid by 2040 leads to congestion as the existing system's interregional transfer capability cannot allow for sufficient flows to meet downstate demand. Without transmission expansion, congestion would result in an average of 3,565 MW of renewable power being curtailed in each hour (this is equivalent to 9.4 percent of total NYCA load) during the winter period.

II. The Commission Should Consider the Full Range of Factors Contributing to the Need for Bulk Transmission Expansion to Achieve the State's Climate Change Policy Objectives

When meeting the state's climate change policy objectives, the power system will likely operate under a very different set of resources and demands, and will likely encounter new challenges in system planning and operation. Transmission expansion can be planned more effectively and efficiently by incorporating multi-faceted drivers such as federal and state policies, bulk and local transmission development, resource availability, market signals, environmental regulations, and demand growth. When conducting any long-term planning analysis, the assumptions made in a study regarding these key drivers necessarily have significant impacts on the study findings.

[22] The Climate Change Impact Phase II, An Assessment of Climate Change Impacts on Power System Reliability in New York State - FINAL REPORT (September 2020) is included as Attachment II to these comments.

Understanding that limited bulk transmission expansions were identified from the New York Offshore Wind Integration Study[23] and Zero-Emission Electric Grid in New York by 2040 studies[24], the NYISO has identified key factors such as maintaining reliability, land-based renewable generation siting and sizing, offshore wind cable routing, and substation interconnections that directly impact the finding and scope of transmission infrastructure needs.

A. The Importance of Continuously Maintaining Reliability

The Climate Change Study, in assessing future system conditions associated with an emission-free electric grid, identified the need for "dispatchable and emission-free resources"[25] to cover any circumstances where the renewable resources are insufficient to meet identified demand, and to evaluate what attributes such a dispatchable resource must have to help meet reliability needs. The study also recognized that building additional transmission capacity will both increase renewable energy production and increase grid reliability and resiliency.

A major goal of the Climate Change Study was to analyze the impact of climate-related disruptions, including include intense impacts that affect power system reliability, such as more frequent and severe storms, extended extreme temperature events, and other meteorological events (*e.g.*, wind lulls, droughts, and ice storms). Increased transfer capability was found to improve the resilience of the power system for all localized events, such as offshore storms or wind lulls that only affect the upstate or downstate regions. Increased transfer capability also improves the ability of the grid to respond to some disruptions that affect load and generation across the state, such as heat waves and cold snaps.

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[23] New York Offshore Wind Integration Study (November 23, 2020), at slide 41.

[24] Zero-Emission Electric Grid in New York by 2040 studies (November 23, 2020), at slide 29.

[25] Climate Change Impact and Resilience Study, at 32. The report is available at the following link: https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase-2-Report.pdf/e9214fd4-9c52-036d-b92b-15f282e686e6, at 32. The NYISO is submitting this report for the Commission's consideration as part of the record in this proceeding.

Separately, E3 was engaged by NYSERDA and conducted the "New York State Decarbonization Pathways Analysis.[26]" The study also concluded that: "Firm capacity [will be] needed to meet multi-day period of low wind and solar output" and that "[t]he need for dispatchable resources is most pronounced during winter periods of high demand for electrified heating and transportation and lower wind and solar output".[27] This approach seems to align with the methodology adopted by the DPS's consultants in the Zero Emission Grid by 2040 assessment, where it was noted that "Siemens performed analysis to ensure New York has enough available capacity to cycle up/down in the 1 to 10-minute horizon to cover variability in load and renewable generation."

The NYISO has not been able to ascertain the extent to which dispatchable or other resources were included in the studies presented at the Technical Conference. Given the significance of maintaining reliability continuously, the NYISO recommends that the final Zero Emission Grid by 2040 report include more information on how this available capacity was calculated, and to clarify how the reliability needs were met with these flexible capacity. We also encourage the PSC and NYSERDA to consider the NYISO's Climate Change Study submitted in this proceeding to supplement the findings of the Zero Emission Grid by 2040 report for a clearer view of potential system reliability needs in a future all-renewable resources power system.

B. The Ability of Energy Storage to Fulfill Future Bulk Power System Reliability Needs

The NYISO's 2019 CARIS 70 by 30 Scenario found that energy storage could decrease congestion, and when dispatched effectively, energy storage would help to increase the

[26] New York State Decarbonization Pathway Analysis; available at the following link: https://climate.ny.gov/Meetings-and-Materials.

[27] *Id.*, at slide 17.

utilization of the renewable generation, particularly the solar generation tested in the analysis.[28] However, the targeted analysis showed that energy storage likely cannot by itself completely resolve the transmission limitations in the pockets analyzed.

Recognizing the ability to store energy when there is excess, and to discharge that energy when there is shortfall, this modeling approach again seems to align with the methodology adopted by the DPS's consultants. In the land-based portion of the New York Offshore Wind Integration Study, the DPS's consultants assumed 3,000 MW of energy storage was deployed across the state, and some were sited at preferable locations to maximize renewable generation utilization, and centrally operated to mitigate potential reliability violations. The description of the energy storage modeling was limited in the materials released at the Technical Conference on Nov. 23, 2020, and we encourage more details to be released at the final report. Careful consideration should be given to how storage resources should be represented in a bulk power system model, such as reflecting the charging and discharging cycles of storage in operations and the probability of their availability.

C. The Availability of Interconnection Points and Transmission Capability to Deliver Upstate and Offshore Wind Energy to Consumers for Renewable Generators

When studying transmission system needs, the assumptions made about where future renewable generation will be sited directly impacts the resulting transmission congestion and curtailment patterns. These patterns drive whether bulk transmission expansion is needed to achieve the state's climate change policy targets. As discussed above, in upstate New York if more renewable resources are assumed to locate in Western New York, Northern New York, and

[28] 2019 CARIS report, at 103.

the Southern Tier as development trends suggest, it is likely new transmission system facilities will be needed to provide renewable energy delivery to consumers.

The NYISO understands, however, that the Zero-Emission study assumed that more renewable generators will be located downstream of the Central East interface, such as in NYISO Zones F and G. Given this assumption, it is foreseeable that transmission expansion needs may be overlooked. Regarding offshore wind integration, injection of smaller MW amounts but at more points of interconnection could potentially require less transmission expansion. Certain sites tested in the New York Offshore Wind Integration Study have as little as 300 MW at each point of interconnection (POI), and as many as five POIs in New York City and five POIs in Long Island.[29] In comparison, the projects awarded Offshore Renewable Energy Credits ("ORECs") in the NYSERDA 2018 and 2020 offshore wind solicitations each seek to inject in excess of 800 MW at each point of interconnection. The transmission and substation expansions required to accommodate injection of large projects can be exponentially more extensive than projects of smaller sizes.

ConEdison[30] and LIPA[31] have both pointed out the need for substation expansion in the Utility Report given that most major substations in this area have already been fully utilized and will need to be expanded to accommodate the new offshore wind interconnections. Based on the cable routing study conducted by the DPS's technical consultant, there appear to be limited available cable routings through the New York City harbor.[32] If each project has independent radial connections, opportunities for necessary cabling to achieve the full offshore wind goal of 9,000 MW will be limited.

[29] New York Offshore Wind Integration Study (November 23, 2020), at slides 17 and 29.
[30] Utilities' Local Transmission and Distribution Report, at 112.
[31] Utilities' Local Transmission and Distribution Report, at 130.

These interconnection concerns are not fully addressed in the consultants' studies, but will directly impact whether feasible interconnection points exist for offshore wind projects or will have to be built. Such needs will also be identified in the NYISO's interconnection studies that are being conducted for proposed generators. These studies will identify system upgrade facilities required to reliably interconnect generators. The NYISO encourages the DPS, NYSERDA and their consultants to take the cost efficiency and time required to build these potential system upgrade facilities into consideration in future studies.

In conclusion, the NYISO notes that neither of the consultants' studies identifies the need for bulk transmission expansions in their preliminary findings. We encourage consideration of alternate assumptions and scenarios, such as those evaluated in the Climate Change Study, CARIS, and the referenced E3 study to more fully understand the potential outcomes as the State's climate policies are pursued.

III. The NYISO's Public Policy Process Provides for the Solicitation, Evaluation and Selection of More Efficient and Cost Effective Transmission Solutions

Timely and coordinated transmission system expansion will be more efficient and cost effective for ratepayers and for the achievement of state policy targets. As discussed in the NYISO's comments on proposed Public Policy Transmission Needs for the 2020-2021 cycle,[33] the NYISO supports the PSC's identification of Public Policy Transmission Needs and utilization of the NYISO's Public Policy Process to solicit competitive solutions, and select more efficient and cost effective transmission solutions for cost recovery under its tariff.

In determining the designation of transmission needs as either priority transmission projects needed expeditiously or as needs for consideration in the Public Policy Process, the PSC

[33] *See* Case 20-E-0497, *In the Matter of New York Independent System Operator, Inc.'s Proposed Public Policy Transmission Needs for Consideration for 2020, Comments of the New York Independent System Operator*, Inc. (January 19, 2021).

should consider whether transmission needed to meet the CLCPA's 2030 and 2040 goals must be completed more quickly than the cumulative time expected by the NYISO's streamlined Public Policy Process, the Commission's siting process under Public Service Law Article VII, and construction and entry into service. Considering typical schedules for siting processes, engineering, procurement, and construction, the NYISO estimates that the total timeline for projects pursued through the NYISO Public Policy Process from the PSC's declaration of a need to entry of a transmission project into service could span approximately five to six years.[34]

Given the multi-year lead time necessary for transmission development in New York, the NYISO supports the Commission finding the need for transmission to achieve the CLCPA to be addressed in the NYISO's Public Policy Transmission Planning Process ("Public Policy Process").[35] The NYISO has made significant enhancements to its Public Policy Process to expand its consideration of certain aspects of transmission project proposals, such as capital cost containment, and to streamline its timeline for consideration and selection of Public Policy Transmission Projects. The NYISO has outlined an estimated timeline to complete the Public Policy Process of approximately 18 months following the PSC's identification of a Public Policy Transmission Need.

CONCLUSION

The NYISO respectfully submits its studies of the state's 2030 and 2040 renewable energy targets, together with its comments on the Utilities Local Transmission and Distribution Report and the DPS/NYSERDA technical consultant's studies, in order to assist the Commission

[34] This timeframe is an estimate that is dependent on many factors through the evaluation process, siting and permitting processes, engineering, procurement and construction.

[35] Capitalized terms not otherwise defined in this document are defined by Attachment Y to the NYISO Open Access Transmission Tariff ("OATT") and otherwise in the OATT and Market Administration and Control Area Services Tariff.

with the important decisions it is considering in this proceeding on New York's future transmission infrastructure needs. The addition of transmission infrastructure is essential to achieving New York State's climate change policy targets under the CLCPA and the Accelerated Renewable Energy Growth and Community Benefit Act. The priority transmission project process and the NYISO's Public Policy Process can work in tandem with the Utility Local Transmission & Distribution infrastructure initiative to fulfill these significant transmission needs. The NYISO looks forward to continuing its work with the DPS, NYSERDA, and the Utilities to address the state's infrastructure needs.

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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 19th day of January 2021.

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