Comments on Initial Report on the New York Power Grid Study
Case 20-E-0197
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Submitted by:

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I. EXECUTIVE SUMMARY

The Alliance for Clean Energy New York, the New York Offshore Wind Alliance, American Clean Power Association, and Advanced Energy Economy Institute are together submitting these comments on the *Initial Report on the New York Power Grid Study* ("Initial Report") in response to the Notice Seeking Comment and Staff Questions issued on February 3, 2021 in Case 20-E-0197. Throughout this document, these groups are referred to as the "renewable energy industry," "our organizations," and "we."

As an initial comment, our organizations greatly appreciate the efforts of the Department of Public Service staff ("Staff") and the New York Public Service Commission ("Commission") in advancing additional investment in the transmission system, in timely fulfillment of the requirements of the *Accelerated Renewable Energy Growth and Community Benefit Act* ("Act") and in recognition of the imperative to examine and pursue transmission system needs in light of the ambitious mandates included in New York's *Climate Leadership and Community Protection Act* ("CLCPA"). We appreciate that this is a new approach to transmission system planning, and we recognize that the requirements of the Act created a new and additional workload for Staff. Using the 70% renewable by 2030 and 100% emissions-free by 2040 mandates in the CLCPA as a planning lens is a critical step in New York's successful transition to the safe, reliable, and emissions-free grid of the future. We commend Staff's work to-date and urge continued and timely progress in decision-making, project approvals, and further analysis and planning.

In reviewing the *Initial Report,* the renewable energy industry has identified the following issues and recommendations:

1. Approve Expedited Local System Upgrades – Phase 1 Projects
2. Further Assess and Approve Local System Upgrades – Phase 2 Projects

3. Pursue the Renewable Energy Zones Concept
4. Declare Public Policy Transmission Needs in PPTNPP and Accelerate NYISO Timelines
5. Conduct Further Analysis for Offshore Wind Needs
6. Pursue Implementation of Advanced Technologies
7. Implement Administrative Changes for PPTNPP and Article VII Permitting, and
8. Improve System Planning and Approach to Assessing Benefits.

The Alliance for Clean Energy New York ("ACE NY") is a member-based organization with a mission to promote the use of clean, renewable electricity technologies and energy efficiency in New York State, to increase energy diversity and security, boost economic development, improve public health, and reduce air pollution. The New York Offshore Wind Alliance ("NYOWA") is a diverse coalition of organizations with a shared interest in promoting the responsible development of offshore wind ("OSW") power for New York. NYOWA is a project of ACE NY.

Our Comments are organized to first explain our priority issues; then answer questions posed by Staff; and then communicate other issues pertaining to each chapter of the Initial Report.

II. PRIORITY RECOMMENDATIONS

As described in Building Clean Energy in NY: The Case for Transmission Investments, transmission is clearly now a climate action issue. As mentioned above, we support and applaud New York's recent steps to accelerate transmission planning and investment using the CLCPA goals as the planning lens. This renewed focus on transmission is evidenced by the establishment of this proceeding; the recent commencement of long-planned transmission projects; the Commission's identification of the Northern Transmission Project as a priority transmission project; the recent Public Policy Needs Order at the March 16, 2021 session regarding OSW needs in Long Island; the establishment of Tier 4 in the Clean Energy Standard; and the completion of the various studies in the Initial Report. It is clear these and further strategic efforts are needed by New York to accelerate transmission buildout.

As the Commission considers our Comments, ACE wishes to submit from the outset that it will be critical for transmission upgrade plans to be developed that effectively address potential congestion and eliminate curtailment. Congestion and curtailment obviously have negative implications for the ability of renewable and alternative energy resources to serve New York consumers thereby enhancing the environment and efficiently and economically benefiting the people of New York State. NYISO transmission studies have also revealed that congestion and curtailment would also jeopardize the State's ability to achieve its nation-leading CLCPA mandates. As established in the Commission's October 2020 Order Adopting Changes to the Clean Energy Standard, NYSERDA is to proceed with its solicitations for both Clean Energy Standard Tier 1 and

the Offshore Wind Tier such that all needed renewable projects to meet the 70% x 2030 mandate have been contracted by 2026 and 2027, respectively. As an initial matter, ACE thus wishes to emphasize that the build-out of renewable energy cannot proceed as cost-effectively as possible unless a transmission planning structure is implemented that considers all existing and contracted projects; identifies future potential curtailments; and then defines the associated transmission upgrades required to eliminate such curtailments. To support the energy deliverability of renewable projects, it is thus critical to implement a clearly defined pathway now to ensure the necessary upgrades are made. These upgrades should be made under Phase 1 as these projects are advanced by the utilities more expeditiously and, where there remain location-specific gaps, under Phase 2 and through other means as discussed fully later in these Comments.

Our organizations have the following priority issues and recommendations:

1. Approve Local System Upgrades – Phase 1 Projects:

We support expediting approval of Phase I projects identified by utilities in Case 20-E-0197 as soon as possible, in the context of rate cases or in special filings if there are not rate cases currently pending. We applaud the Commission's action in its February Order[1] conceptually approving the Phase 1 projects. These projects are important to get started as soon as possible. These projects, when implemented, will only partially help reduce bottling of existing and proposed renewable resources. We note that Page 3 of the Initial Report states that Phase 1 upgrades could be enough to meet the CLCPA's 2030 requirements, though the report later recognizes the limitations of the modeling assumptions. This conclusion is worrisome for the renewable community given the significant level of curtailments identified in the NYISO 70x30 CARIS study and that third-party consultants are starting to project for many areas in NY. Phase 1 upgrades represent, across many of the top CARIS pockets, only minimal upgrades to the several constraints identified by a pocket, for example, in the Southern Tier and in the Northern area. While all projects should be implemented, the utilities should be required to prioritize upgrades in particularly constrained, high-interest renewable zones. Rapid Implementation is key and all efforts for rapid implementation of the projects should be pursued.

2. Further Assess and Approve Local System Upgrades – Phase 2 Projects:

With respect to Phase 2 projects, it is critical that the Commission identify the most cost-effective CLCPA-driven transmission projects to address local system needs, whether these solutions be on the local system or on the bulk system. The suite of Phase 2 projects should be designed to solve or mitigate all the renewable energy pockets identified by the NYISO 70x30 CARIS study and other

[1] NY PSC Order issued March 18, 2021 in Cases 20-E-0497 and 18-E-0623.

relevant studies.[2] It is important to note that the CARIS study identified significant curtailment across many regions in upstate New York. The dispatch assumptions that were used for defining an initial set of Phase 2 projects underestimate the amount of renewable injection, therefore underestimate the significant curtailment and congestion risk that renewable projects face on an MWh basis. The final approved Phase 2 projects should be those that are most cost-effective and facilitate the maximum amount of renewable energy development and injection.

To make this determination, the Commission will likely need to have a comparison of Phase 2 projects brought forth by the utilities in additional specificity and detail with projects that may be proposed by non-incumbents through the FERC Order 1000 Public Policy Transmission Needs Planning Process (PPTNPP) as implemented by the PSC and the NYISO. We urge the Commission to facilitate and pursue this decision-making process as soon as practicable, to result in a suite of approved Phase 2 projects by the end of 2021. At a minimum, the Commission should allow Phase 2 upgrades within the areas proposed for prioritization in the Initial Report to be refined and finalized such that any Phase 2 upgrade, identified as cost-effective and facilitating renewable integration, can be approved by the end of 2021 in those priority areas.

3. Pursue the Renewable Energy Zones Concept

Investment in transmission in identified Renewable Energy Zones (REZ), as suggested in the *Initial Report,* should be pursued along with Phase 2 projects, without slowing down the finalization and approval of an initial suite of Phase 1 and 2 projects. The REZ concept can also be the subject of the PPTNPP to solicit the best ideas. A REZ concept has the advantage of better aligning transmission and generation, given that transmission investments will guide future generation-siting decisions. As the REZ concept is further developed, appropriate interconnection infrastructure should be planned. This is especially important for upstate wind and solar, as projects may be tens of miles away from the 345kV backbone. In addition to reinforcing the transmission system to allow for renewable deliverability, an exploration of the REZ concept should consider what additional infrastructure is needed to connect to the backbone system. This infrastructure would eliminate one of the big barriers to development for projects in upstate NY where potential good resource projects are far away from the existing lines. In an identified REZs, NY could integrate renewables more efficiently by building several strategic 345kV collector stations and the 115kV lines to connect new generation to those. In developing the REZ, the Commission should engage in a transparent and inclusive stakeholder engagement process.

[2] For example, from an offshore wind perspective and a Long Island specific interconnection perspective, this study only assumes about 1.7 GW on LI. This number has already been surpassed by currently contracted projects: South Fork (130 MW), Sunrise (880 MW), and Empire Wind 1 (816 MW). Thus, it does not capture the need for additional bulk transmission buildout on Long Island. Hence other relevant studies related to Case 20-E-0197 should also be addressed.

4. Declare Public Policy Transmission Needs in PPTNPP and accelerate the NYISO timelines for Land Based Wind and Solar, For Better Alignment Between Transmission Needs and Generation In-service Dates

The Commission should Identify/declare public policy transmission needs in a timely fashion under the FERC Order 1000 process (PPTNPP) for both offshore wind and upstate wind and solar – so that the private sector can propose transmission solutions. Declaring public policy needs has the advantage of allowing for a multitude of solutions to be assessed and ranked so that the most cost-effective upgrades are selected. A transmission solution at bulk level could complement or replace a Phase 2 upgrade, and a coordinated assessment at both local and bulk level would enable the selection of the best solutions for each area. The NYISO CARIS study showed the need for grid upgrades in many pockets in upstate NY, and the 2018 and 2020 PPTNPP needs submissions also support declaring public policy needs in many areas, including the areas that the Initial Report is proposing for prioritization.

5. Conduct Further Analysis for Offshore Wind Needs

Once new offshore Wind Energy Areas are established by the federal government, and the Clean Energy Standard (CES) Tier 4 projects are selected and their interconnection points are known, the renewable energy industry recommends that New York reevaluate the needs of the grid system to achieve 9,000 MW of offshore wind including the cost and benefits, technical considerations, cost sharing and operation and maintenance issues associated with an offshore transmission meshed versus radial system.

6. Pursue Implementation of Advanced Technologies

We support the rapid implementation of advanced technologies. We propose mechanisms to tease out such opportunities, allow third parties to propose and implement advanced technology solutions to help improve system efficiency and reduce costs, and implement efficient incentive structures for utilities.

7. Implement Administrative Changes for PPTNPP and Article VI Permitting

The renewable energy industry recommends that New York act to streamline the public policy transmission planning process to yield results on an expedited timeline, as well as streamline the Article VII transmission siting process to allow for faster certification of projects. Further, our organizations support the continuation of NYPA assisting in identifying and implementing high

priority transmission system investments. The Commission should also act to expand the solution set for renewable developers to de-risk the prospect of project interconnection delays and/or unreasonably high interconnection costs, including through expanding the definition of NYISO OATT Section 30.12.2.3 to apply to all Phase 1 and Phase 2 projects as discussed further in this document.

8. Improve System Planning and Approach to Assessing Benefits

Future studies on the benefits of system upgrades should be done in a more holistic fashion, as correctly identified in the Initial Report. Assessments of the benefits of upgrades should be expanded to consider energy in addition to capacity, and the knock-on effects for other parts of the system – both upstream and downstream from the upgrade. Furthermore, the planning framework should systematically incorporate non-traditional alternatives into the solution set and develop a technologies-agnostic methodology for considering the entire suite of network solutions, including but not limited to non-wires alternatives and advanced technologies.

III. RESPONSES TO QUESTIONS POSED BY STAFF

The following are the responses to Staff Questions issued on 2/1/21 in Case 20-E-0197.

***Priority Issues - Question 1**: On pages 35-36 of the Initial Report, several areas on the local transmission system are identified where the available "headroom" does not support existing and planned renewable generation resources. Are there other areas that have similar characteristics and constraints which the Commission should prioritize for local transmission solutions? How should the Commission identify additional high-priority areas?*

On pages 35 – 36, the Initial Report offers three areas for prioritization of grid investments beyond Phase 1 projects: (1) Genesee, Lockport, and Lancaster; (2) Hornell and South Perry; and (3) Watertown/Oswego/Porter. **ACE NY recommends and supports prioritization of these three areas.** These are areas where significant renewable development has been advanced and procured by NYSERDA and which were identified as constrained pockets in both the NYISO 70x30 CARIS study and the local Utilities' analyses with multiple constraints impacting each of the three areas.

- Area 1, defined as Genesee, Lockport and Lancaster, is known as pockets W1 and W2 in the NYISO CARIS study. There are approximately 1,500 MW of renewable projects with a NYSERDA award that are yet to come online. There are multiple Phase 1 grid upgrades that will improve

congestion in the area but to the extent additional improvements are possible, ACE NY recommends this area be prioritized.

1. Area 2 is defined as Hornell and South Perry and known as pocket Z1 and has significant renewable generation development. Across all Southern Tier zone (pockets Z1 and Z2 in NYISO CARIS study), there are over 1,700 MW of renewable projects with a NYSERDA award that are yet to come online. Additional mid-late development projects in the queue in those areas will benefit from grid reinforcements and could be procured in the upcoming NYSERDA RFPs. Reinforcing this area of the grid will also enable more west to east transfers of low-cost energy. The Southern Tier has been recognized as a top needs area in the last two NYISO's Public Policy Transmission Needs processes (2018 and 2020) with multiple stakeholders supporting a public policy need determination in the Southern Tier region.

- Area 3 defined as Watertown/Oswego/Porter and known as pockets X2 and X3 also has significant renewable generation development with close to 700 MW of renewable projects yet to come online, with a NYSERDA award. Additional mid to late-stage development in the queue can benefit from grid reinforcements in this area.

There are other areas where constraints create a need for local transmission solutions. The Commission should identify those areas where significant renewable development has been advanced and procured by NYSERDA (both contracted and non-contracted projects in the NYISO queue) and/or which were identified as constrained pockets in both the NYISO 70x30 CARIS study and the Utility Transmission & Distribution Investment Working Group Study ("Utility Study"). Using this approach, the other candidates for prioritization, for example, are:

- The areas known as Y1 and Y2 have significant renewable development and procurement to date. Multiple Phase 1 projects were proposed in this area and might address many of the identified constraints, but prioritization of the area could allow for additional solutions to be vetted or accelerated. In the Utility Study, the Berkshire and Mechanicville areas identified by Avangrid; the Albany South and Capital Northeast areas identified by National Grid; and the Northwest transmission areas identified by Central Hudson together corresponds roughly to the CARIS generation pockets Y1 and Y2.

<u>Priority Issues - Question 2</u>: What methodologies and criteria should the State use to assess whether a region of the State is conducive for development as a local renewable energy zone?

In assessing where appropriate locations are for designation as Renewable Energy Zones, the Commission should consider[3]:

- Resource quality as measured by strength of wind resource and solar resource availability.
- Land characteristics such as topography, environmental feasibility (i.e., presence of wetlands).
- Developer interest as determined by either direct developer feedback, interconnection requests, land rights acquisition, or investments in studies. On the other hand, the more impactful location for REZs could be where there is positive resource quality and land characteristics but *little* interest from developers due to the lack of proximate bulk or local transmission and distribution interconnection availability. That is, the Commission should look "beyond the queue" to tap new areas.

Technology Transfer and Deployment - Question 1: The Initial Report includes recommendations related to the adoption of advanced technologies for bulk and local transmission. Staff seeks input on the following: The Initial Report identifies a number of technologies that it characterizes as "well-tested," and that can represent cost-effective solutions and enhancements to the grid. (Executive Summary at page 8; see examples discussed in Section III.B.). Are there other potentially valuable technologies that have received a similar level of deployment and operation in other jurisdictions of which the Commission should be aware? How can the Commission accelerate implementation of these advanced technologies in New York? How should utility local transmission and distribution (LT&D) planning processes incorporate consideration of these advanced technologies? How can New York ensure that utilities will integrate these new technologies swiftly and effectively into their planning and operations?

Our organizations are supportive of the deployment of grid-enhanced technologies (GETs) either as stand-alone investments or combined with traditional grid upgrades to optimize existing and future transmission capacity. Advanced technologies should be encouraged to be deployed even on a temporary basis. The Commission should encourage deploying such technologies across the full footprint given their ability to allow for optimizing the capacity of the grid. The deployment of such technologies could be supported by asking utilities to demonstrate efforts to maximize the existing capacity of the system using such technologies, and documenting upgrade solutions with/without such technologies or why such technologies could not be deployed in combination with traditional upgrades or as stand-alone upgrades.

[3] See for reference: NREL Publication: "Renewable Energy Zones: Delivering Clean Power To Meet Demand" at https://www.nrel.gov/docs/fy16osti/65988.pdf

Grid enhancing technologies (GETs) can move GWs, save billions of dollars for consumers and abate tens of millions of metric tons of CO2 in the next five years. The evidence in this section, all substantiated by publicly available data, establishes that projects using commercially available GETs help utilities cost-effectively accelerate the energy transition. Leveraging GETs to unlock network capacity yields outsized benefit by allowing greater deliverability of existing renewable generation and by simplifying the network upgrades associated with new generation interconnection. This simplification results from fewer expensive, long-lead new line builds and reconductors, which are often delayed by extensive permitting and land acquisition processes. This section provides both recommendations and assurance that each of the technologies named above is commercially available, operationally reliable, and an important part of any energy transition toolkit.

The latest power flow control devices leverage VSC (voltage source converter) technology that has been proven for more than 20 years at high-voltage applications including STATCOMs, HVDC and variable-speed wind power applications. Leaders from across the industry agree that power flow control is an established, reliable, advanced technology. In reference to an installation in 2019 which unlocked 95 MW on the UK distribution network and saved customers £8 million, Ian Cameron, Head of Innovation at UK Power Networks said, "*At its heart, this is a story of optimization. It continues to forge the path towards renewable energy, while saving money for our customers. It's the key to unlocking extra capacity in a safe, cost-effective, and fast way. This successful trial demonstrates our business ethos of innovation and disruption; implementing smart technologies to reach the UK's target to reduce CO2 emissions by 80% by 2020 and Net Zero by 2050.*"[4] Commenting on projects in 2020 where advanced power flow control is unlocking 1.5 GW of transfer capacity on the UK transmission network and is saving customers more than £387 million, David Wright, Director of Electricity Transmission and Chief Electricity Engineer at National Grid Electric Transmission (UK), explained, "*This is an example of our commitment to deliver clean and affordable energy for our customers. We have already completed several innovation projects and have been impressed with [the] technology and professionalism. I can see a world very soon where power grids everywhere become more intelligent, digital and controllable. NGET will be a leader in this transition and it's inevitable that technology like [this] will be a big part of this future.*"[5]

Dynamic Line Rating (DLR) studies and deployments have shown similar impact and efficacy. Oncor Electric Delivery Company (Oncor) showed that a sizeable amount of congestion mitigation could

[4] https://www.ukpowernetworks.co.uk/internet/en/news-and-press/press-releases/Technology-powers-45000-homes-with-renewable-energy.html
https://www.smartwires.com/2019/09/30/smart-wires-ukpn/
[5] https://www.tdworld.com/overhead-transmission/article/20973449/national-grid-makes-power-flow-control-deal-with-smart-wires

be obtained with as little as 5 to 10% increase in capacity over the existing line ratings.[6] Oncor estimated that DLR technologies deployed on five percent of ERCOT transmission lines, would yield approximately $20 million in savings from congestion reduction, equivalent to a 3% reduction in congestion costs.

AEP and the Southwest Power Pool (SPP) identified opportunities for a DLR system on a 2.1-mile segment of a transmission line that could save approximately $18,000 during just 300 minutes of real-time grid congestion, equating to several million dollars of savings annually. In 2017, AEP tested a DLR system which showed increased capacity over ambient-adjusted ratings over 90% of the time.[7] Elia, the Belgium transmission system operator, studied DLR systems on eight of ten critical transmission interconnectors with France and the Netherlands during the winter of 2014–2015.[8,9] After this initial study, Elia deployed a utility-wide DLR system on 30 transmission lines, helping them increase exchange capacities with their surrounding countries (France, Netherlands, Luxembourg, and Germany). In a single 4-hour period, Elia identified $0.26 million of congestion savings provided by the DLR system deployment, which enabled 33 MW of additional import.

Further, system operators in different jurisdictions have employed topology optimization to improve flows on the meshed transmission network. For example, National Grid Electricity System Operator (NGESO), the UK system operator, optimizes the configuration of the UK transmission grid working with Transmission Owners to redirect "flows to parts of the network with capacity."[10] By doing so, the additional transfer capability achieved by the UK grid can exceed 1000 MW over interface constraints[11] that are similar in nature to New York constraints such as the Central East interface. In the U.S., ERCOT uses advanced topology control analyses to support operations planning functions, including to improve grid reliability and resilience by mitigating the impacts of transmission contingencies.[12] SPP has reported increases in constraint capacity exceeding 20% by the use of optimal reconfigurations for a number of constraints, and has used them to relieve the top four transmission constraints in its footprint in 2019.[13] A utility in MISO reported using

[6] https://www.smartgrid.gov/files/SGDP_Transmission_DLR_Topical_Report_04-25-14_FINAL.pdf
[7] https://watttransmission.files.wordpress.com/2018/10/cigre-gotf-2018-ngn-pjm-aep-linevision-final.pdf
[8] https://watttransmission.files.wordpress.com/2018/01/ampacimon-dynamic-ratings-increase-efficiency_belgium-transmission-grid.pdf
[9] http://www.ampacimon.com/wp-content/uploads/2016/09/Cigre_C2_PS1__20161.pdf
[10] "Transmission Thermal Constraints Management Information Note," National Grid ESO, July 2018, p. 4, https://www.nationalgrideso.com/sites/eso/files/documents/National%20Grid%20Transmission%20Thermal%20Constraint%20Management%20information%20note_July%202018.pdf.
[11] R. MacLaren, P. Ruiz and J. Caspary, "New Constraint Management Techniques for Meshed Transmission and Active Distribution Networks," CIGRE UK Technical Webinar, Dec. 2020, https://drive.google.com/file/d/1Hz4cwnUXdpAUW-1COGCqrW4AuhMtRR8u/view.
[12] P. Ruiz, J. Caspary and L. Butler, "Transmission Topology Optimization Case Studies in SPP and ERCOT," FERC Tech. Conf. on Increasing Day-Ahead and Real-Time Market Efficiency and Enhancing Resilience through Improved Software, Docket No. AD10-1222-011, June 2020, https://ferc.gov/sites/default/files/2020-06/W3-1_Ruiz_et_al.pdf
[13] Southwest Power Pool (SPP) State of the Market 2019, p. 199, fig. 5–10, https://www.spp.org/documents/62150/2019%20annual%20state%20of%20the%20market%20report.pdf

advanced topology control to mitigate congestion and overloads during the Polar Vortex event of 2014 that had increased the cost of electricity in the affected areas by over $15 million during a 10-week period.[14]

The Commission should formalize a loading order approach to transmission planning that requires LT&D utilities to demonstrate they are optimizing, then upgrading, and finally expanding the existing network. As mentioned previously, utilities' approach to maximizing system efficiency has historically been ad-hoc, typically lacking comprehensive evaluation of proven technologies, specifically GETs. Currently, when utilities seek to construct new facilities, they must demonstrate a need for the project and consider alternative routes through the Article VII process. ACE NY suggests extending this demonstration requirement by mandating that, prior to pursuing reconductors, rebuilds, line upgrades, and new lines, utilities demonstrate due diligence conducted in exploring GETs as a comparable alternative. Requiring the utilities to include a GETs alternative as part of their standard alternatives analyses will inherently prioritize use of GETs, which can quickly and inexpensively unlock transmission capacity for renewable integration and increase system flexibility once deployed. This enhanced flexibility and dispatchability, which can be implemented in a fraction of the time of traditional system upgrades, will itself improve system upgrade and expansion solutions. By resolving grid constraints in the near-term, GETs will enable faster and lower cost achievement of the state's energy goals. In a matter of a few years, true widespread GETs implementation in New York could transform the grid and demonstrate meaningful progress on the path to a 100% emissions-free grid.

Technology Transfer and Deployment Question 2: The Initial Report (at page 52) recommends: "To identify high-priority locations where advanced transmission technologies could quickly and cost-effectively provide unbottling benefits on the existing grid, the PSC could implement a process through which renewable generation owners and developers would be able to provide information on particularly constrained locations. This information could then be made public, such that either the utilities or advanced technologies vendors could propose cost effective solutions to address the constraints." What key consideration and/or process elements could help such a process to increase the rate of successful deployment of advanced technologies? Should the Commission establish such a process?

One major challenge with the current New York transmission planning process is the lack of formal requirement for utilities to maximize the efficiency of the existing network. Increasing utilization of all circuits, while maintaining system reliability, can be accomplished using GETs, which bring the added benefit of providing more granular control over line dispatchability once installed. One approach could be to work with the NYISO to adopt a requirement for utilities to evaluate GETs in

[14] B. Tsuchida and R. Gramlich, Improving Transmission Operation with Advanced Technologies: A Review of Deployment Experience and Analysis of Incentives, The Brattle Group, June 2019, p.14, https://brattlefiles.blob.core.windows.net/files/16634_improving_transmission_operating_with_advanced_technologies.pdf

every reliability, generation interconnection, and economic project submission. The Commission could urge a filing to FERC under Section 205 of the Federal Power Act for tariff modifications in these areas or intervene in individual cases where the option should be considered. The updated tariff could also compel utilities to publish specific data about the evaluation, including capital and ongoing maintenance costs for alternatives, timeline for installation, associated transmission outage requirements for installation, and land or footprint requirements. This public review will ensure the utilities are conducting appropriate due diligence on GETs and are consistently working to achieve DPS goals of network efficiency and flexibility. Another approach would be for the Commission to add a requirement within the Article VII process to include GETs as an evaluation alternative.

Technology Transfer and Deployment-Question 3 The Initial Report (at page 52) discusses the application of incentive regulation schemes (such as shared savings approaches) to encourage advanced technology deployment. Is an incentive necessary or appropriate to encourage rapid deployment of advanced technologies on the distribution and local transmission systems? What key considerations should apply?

Output-based regulation can facilitate use of technologies and strategies to meet aggressive targets rapidly, efficiently, and cost-effectively. The metrics described previously, which focus on cost-effective renewable integration, will publicly demonstrate that those utilities which wholeheartedly embrace all proven technologies are supporting New York target achievement, while those that reject GETs will have difficulty securing project justification.

However, without sufficient financial motivation to utilize these technologies, meeting new requirements may ultimately become a mere formality or halfhearted effort for utilities. To effect comprehensive long-term market impact, ACE NY suggests a combination of such output-based regulation in combination with appropriate incentives that encourage quicker or lower-cost achievement of these outcomes to produce the best results. Developing an incentive structure is likely a more effective means for utilities to deliver a more efficient grid. However, incentives require more deliberate and complex regulatory structures, which will take time to establish and could take the form of shared-savings incentive approach to encourage advanced technology deployment. Such a mechanism is most likely to drive utility behavior in support of regulatory goals for renewable integration, lower customer costs, and overall network efficiency. There could be other incentive mechanisms as well that could be explored further.

Recommendations for Further System Studies - Question 1: What studies should be pursued to better understand (1) future generation and flexibility (including storage technology) options that may be needed and available after 2035 to cost-effectively eliminate the residual emissions necessary to achieve a zero emissions grid by 2040, and (2) the extent to which these technologies

will impact grid investment and operational needs? Which such further studies should be pursued most immediately?

We encourage the Commission to continue studies of Phase 2 upgrades. The Initial Report itself acknowledges several areas of improvement and further study. We encourage the Commission to continue refining these studies by:

- Updating the study in the next few months with the latest NY transmission and interconnection developments. In particular, the Grid Study does not consider any OSW injection in Astoria and Barret, and those are the selected POI's by Equinor. Also, the Study should consider the upcoming Tier IV solicitation results and model the awarded contract(s). This update will give a more accurate view on how much headroom there is in the system, and if the overall conclusion that NY can accommodate 3GW of OSW in Long Island and 6GW of OSW in NYC still holds true.
- The study should include a more thorough analysis of light load flows in Long Island and NYC. It is our concern that the Grid Study is too focused on summer peak, but most of the congestion and restrictions would happen during light load periods, where overall load is lower in Long Island, so flows to Zone J will be increased.
- Discuss whether Staten Island POIs (Fresh Kills and Goethals), could open an alternative option for OSW interconnection, in addition to those POIs along the East River and in Long Island.
- DPS Staff and NYSERDA should continue aligning their congestion study with those for NYISO's CARIS. In particular, the studies should bridge the gap between the 230kV and higher voltages and the lower voltage 115kV and 69kV grids.
- Subsequent versions of the study should include an Affected System evaluation Project(s) under construction from the 2017 Class Year may trigger upgrades in the PJM-NY Transfer Limit. This limit was also an issue for some wind projects in Class Year 2019. It is our concern that this problem will be exacerbated as more projects interconnect and the Grid Study should give adequate attention to this issue.

<u>Recommendations for Further System Studies - Question 4:</u> With regard to offshore wind, how should the State consider whether or when to shift from "onshoring" offshore wind generation with radial transmission lines and instead transition to obtaining OSW generation that makes use of a meshed offshore transmission system? In assessing this, what factors should the State consider, beyond economic costs and benefits, redundancy and risk mitigation, and conflict minimization both offshore and at onshoring points?

With respect to offshore wind transmission needs, our organizations suggest that New York State should consider pursuit of a meshed offshore transmission system by 1) declaring a need for such

a system through the current PPTNPP and calling for solutions, and 2) further analyzing options for such a system following federal designation of Wind Energy Areas in the New York Bight, as well as selection of projects under the current Clean Energy Standard Tier 4 RFP. Armed with that additional information, plus an assessment of the points of interconnection that uses the more likely, larger interconnection requirements, New York can then examine a range of options for a meshed system as well as a range of proposed solutions.

In any case, NYSERDA should not delay annual OSW solicitations while it continues to analyze and explore a meshed vs. radial offshore transmission system. A regular procurement schedule, as approved by the Commission in its October 15, 2020 Order[15] provides an important market signal to the offshore wind industry and is necessary for New York to meet the CLCPA's offshore wind mandates. Further, ensuring the size of any specific procurement allows developers to maximize transmission delivery and minimize per MWh costs. The current procurement approach is competitive, producing high value, economic development and ports benefits with attainable technical standards.

Following the further analysis referenced above, NYSERDA could consider a meshed offshore transmission system in an offshore wind solicitation. As discussed further in Section VI below, NYSERDA should only include a meshed system alternative in future OSW solicitations once it has developed clear requirements regarding technology, cost sharing, cost recovery and operation and maintenance arrangements. Further, the Commission should use the NYISO public policy process to advance privately developed alternatives for a meshed offshore wind transmission system.

How should uncertainty relating to federal Bureau of Ocean Energy Management pending/future identification of wind energy areas be factored in?

The process for the designation and leasing of offshore wind energy areas and subsequent leasing in the New York Bight has been delayed for nearly two years. Ideally, the federal Bureau of Offshore Energy Management ("BOEM") will restart this process and complete the designation of WEAs by year's end and hold lease auctions in early 2022. Absent a clear signal from BOEM that it will meet this schedule and given the aggressive OSW targets in the CLCPA, NYSERDA should not delay future OSW solicitations and should maintain the schedule outlined in the Commission's October 2020 Order.[16] Once the new WEAs are designated in the NY Bight, the Commission and

[15] New York State Public Service Commission, Case 15-E-0302, Order Adopting Modifications to the Clean Energy Standard, Page 40-41.
[16] Ibid, Page 40,-41.

NYSERDA should immediately update and expand their analysis of a meshed offshore transmission system.

To what extent should a regional approach together with neighboring control areas be examined, including costs and benefits, risk, and conflict minimization?

See Recommendation on Interregional Links "Continued Planning, Coordination and Studies" Section below.

Planning - Question 1: How can the State achieve balance between the need for coordinated planning of renewable generation, energy storage, and transmission and the requirements of competitive energy markets and open access tariffs?

The transmission planning process should consider the accelerated procurement schedule for new resources to meet the CLCPA's targets. The Commission needs to move forward with the prioritization and acceleration of transmission in several areas where renewable development and procurement has been advanced. This is needed to preserve those investments and enable successful completion of the contracted renewable energy projects.

By declaring public policy needs under FERC Order 1000, NYISO will be undertaking a coordinated bulk-level study that would identify the best local, bulk or combinations of bulk and local solutions to address immediate needs. Subsequently, the Commission could require NYISO and local transmission companies to identify near-term and long-term needs every year, that details the alignment or lack thereof, of future generation build with the transmission system inclusive of approved transmission upgrades. In regions where curtailment and congestion risks are forecast to be high in the short, medium, or long term, transmission investments should be prioritized. Such information could also guide NYSERDA procurement decisions to optimize procurement within areas with future grid investments or based on the transmission capacity available in each zone.

We note that competitive markets are a means to the end, not an end by themselves. The State has ambitious mandates for clean energy resources. Reliance on the development of purely merchant generation resources may not yield the magnitude of renewable resources needed and would not facilitate the accomplishment of the CLCPA goals. Most renewable resources are in locations far from load centers and require transmission to move the output. Generators will hesitate to invest or will seek a higher REC price (to reflect the risk of potential curtailment) if there is not adequate transmission. Given the need for massive amounts of renewable resources, especially by 2040 to meet the zero emissions mandate, it would behoove the State to remove barriers to generators including pursuing transmission aggressively. More integrated generation

and transmission planning would help reduce overall costs to consumers while helping accomplish the CLCPA mandates.

Planning - Question 2: How can planning processes be improved across seams to achieve better total system outcomes, between LT&D upgrade planning that is performed by the individual utilities and bulk-power system planning and generation interconnection processes that is led by the New York Independent System Operator (NYISO)? Similarly, how can planning processes be improved between utilities in cases where the service territories adjoin?

The NYISO should undertake a special inter-regional study with neighboring RTOs to determine the level of investment required to limit congestion at the seams.

DPS and NYSERDA should coordinate closely with neighboring States such as New Jersey, as well as federal agencies (such as FERC, DOE, NREL or BOEM) and discuss if there are common practices and standards that could be adopted. For example, are there HVDC Standards that would allow for future integration and interconnection of several HVDC lines into a meshed option? Could those standards be adopted by all suppliers of HVDC solutions? Are there technical solutions that would allow future installation of HVDC cables in those areas that are constrained (for example the Narrows or other landing points in Long Island)? Should future solicitations require physical room for additional HVDC cables?

Planning - Question 3: Considering the Power Grid Study findings, is there a need to revise the Commission's procedures for implementing its role under the NYISO's Order 1000 planning tariff? If so, how should those procedures be modified?

The Commission and the NYISO PPTNPP processes have successfully resulted in two major transmission initiatives: Western NY and AC transmission. We applaud the Commission and the NYISO for their actions. Expanding the scope of the Order 1000 process may yield additional benefits. Presently the Order 1000 process appears to be limited to consideration of bulk power transmission projects. The two primary advantages of the PPTNPP are the ability to use competition to select from competing projects, and the ability to use the 'beneficiaries pay' approach for cost allocation and recovery for the selected projects. However, there may be other non-bulk power projects that could benefit from a similar approach; the Commission could either use the existing Order 1000 process or create one akin to that using the State tariffs to allow for the use of beneficiaries pay for cost allocation and recovery. Allowing public policy transmission upgrades to be undertaken by local transmission companies outside Order 1000 allows for more flexibility in deploying grid investments at the local transmission level but the process should still allow for coordination with NYISO and allow for a diverse set of solutions to be proposed and vetted. Further, the process should allow for bulk power proposals that may be more cost effective

in certain instances than considering solely the local TO upgrades that some utilities may have proposed as Phase 2 projects.

There could be further improvements in the process for rapid decision making to allow for more transmission needs to be met on a faster time scale. The Commission should consider declaring public policy needs under Order 1000 and work with the NYISO for a streamlined process to allow alternatives to be vetted within defined timelines that do not delay investment decisions. Such an expedited process could also be put in place for a certain set of upgrades; for example, those above a certain threshold cost or in areas identified as Renewable Energy Zones.

Another approach to streamlining the PPTNPP is for developers who make it through the Viability and Feasibility phase of the NYISO evaluation to be allowed to recover costs for the development of the Article VII application. The Viability and Feasibility phase has taken about six months to complete with the second phase being longer and likely taking a year. The preparation of an Article 7 application typically takes about a year (depending on project scope). So, if a developer starts preparing the application after Viability and Feasibility stage, they could complete that about the same time that the NYISO makes its selection. The potential concern would be the cost of having multiple developers being allowed to recover the costs. This could be controlled by (1) limiting recovery to only those developers who make it through the Viability and Feasibility phase and (2) Commission could cap the cost recovery per application. Cost recovery of these costs is the reason that developers do not advance the Article 7 application preparation sooner (until they are selected). Providing for cost recovery could mitigate the delays in the Order 1000 approach.

Another area that deserves further discussion is coordination of the NYISO generation interconnection process with the Public Policy Transmission projects. Currently, interconnection costs are identified one by one on each project's SRIS study, and as a cluster on each Class Year Study. This is a design that works well to identify incremental generation interconnection costs on the grid but does not necessarily capture the effects of a large generation shift as we now envision for CLCPA. For both offshore wind and Upstate wind and solar, there should be a discussion as to whether NYISO should perform Cluster Interconnection studies to allow for a more coordinated approach. NYISO's tariff does have a provision for this type of study at NYISO's discretion. We believe that the Cluster Study would allow the coordinated study of offshore wind and identify the required transmission upgrades in a more holistic manner. This Interconnection Cluster Study could also coordinate with NYISO's Public Policy transmission approach, if some of the upgrades identified in the study qualify as Public Policy projects. This would eliminate the need of coordinated funding and securitization among offshore wind developers, and ensure transmission is built in a timely manner. Public policy projects would make use of the FERC Order 1000 competitive transmission bidding process, so they provide a market mechanism to reduce cost to

ratepayers. DPS and NYSERDA should evaluate with NYISO when a Cluster Interconnection Study could make sense to advance NY's interconnection goals. In addition, DPS and NYSERDA should be aware that current interconnection study timelines are typically delayed. On average, projects may wait two years for a facility study. Class Year studies were supposed to be run every year but have been commenced with less frequency – e.g., every two years in practice. DPS and NYSERDA should discuss with NYISO what measures could be taken to streamline the interconnection process so it does not remain a bottleneck that will delay meeting the State's goals.

IV. UTILITY LOCAL TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

Section II of the Initial Report focuses on utility local transmission and distribution (LT&D) infrastructure. There are various areas where the Initial Report can be improved by identifying or further examining ways to enable New York to meet its goals under the CLCPA at lower cost. There are opportunities to expedite and expand infrastructure development plans and remedy various market design and system access issues to enable greater competition in future solicitations at modest cost. These opportunities are time-sensitive, insofar as NYSERDA is planning to complete solicitations by 2026 that achieve the 70% by 2030 mandate. Increasing the share of renewable energy serving load to 70% will require substantial procurements, implying similarly substantial benefits to reducing the renewable energy credit (REC) prices of such procurements by 'unbottling' favorable development areas in a timely fashion.

Page 3 of the Initial Report notes that Phase 1 upgrades could be enough to meet the CLCPA's 2030 requirements, though the report later recognizes the limitations of the modeling assumptions, saying, "*Through 2030, the need for upgrades to the Utilities' local transmission and distribution systems may be limited to the acceleration of LT&D projects that are already in the Utilities' plans to address expected reliability needs and refurbishment of aging assets. On a total state-wide basis, these Phase 1 projects appear to expand the local grid's headroom sufficiently to integrate the land-based renewable resources needed to meet the CLCPA's 2030 requirements, and possibly beyond*." (Initial Report, Page 3). The Initial Report later states, "*However, as explained above, the headroom estimates associated with Phase 1 projects may be associated with significant curtailments, given that the Utilities' analyses evaluated headroom capacity needs mostly at "average" renewable output levels rather than at installed capacity. This means that additional local transmission upgrades may become necessary (beyond the proposed Phase 1 projects) as actual projects attempt to interconnect."*

The above statements are worrisome for the renewable energy industry given the significant level of curtailments identified in the NYISO 70% by 2030 CARIS study and that third-party consultants are starting to project for many areas in NY. Phase 1 upgrades represent, across many of the top

CARIS pockets, only minimal upgrades to the several constraints identified by a pocket, for example in the Southern Tier and in the Northern area. This puts contracted renewable projects at risk because they might not have accounted for the high congestion when initially developed and when contracts were awarded. Potential bottling will lead to higher REC prices as new projects that will be submitted in upcoming RFPs will account for the higher transmission risk absent a specific plan and acceleration of grid upgrades. Furthermore, the headroom identified for each upgrade is not cumulative and renewable project development will not fully align with where the upgrades are done. Hence, the conclusion that the CLCPA's 2030 requirements can be met with only Phase 1 upgrades is therefore troublesome and doubtful.

The Initial Report first assumed all low voltage constraints are being addressed and subsequently identified a limited set of required bulk upgrades. The findings of the study could be misleading because, in reality, not all low-voltage constraints are going to be addressed in a timely manner and because local transmission upgrades could alter flows on the system, which is not being captured in the bulk study. The study does however recognize the need to accelerate certain LT&D upgrades over the next decade, which is a real need.

The positive impacts of Phase 1 and Phase 2 projects in reducing curtailment and congestion risk can only be substantially incorporated by developers into their forecasts (and REC bids) if they have a high degree of certainty that these transmission projects will materialize, given the conservative nature of lenders and the capital-intensive nature of renewable resources. It is therefore important that the timelines of implementation of Phase 1 and Phase 2 projects, along with other important reforms, are moved forward into the early and mid-2020s to the degree possible, so that their benefits can be incorporated into renewable project developers' forecasts and translated into lower REC bids in NYSERDA's future solicitations and thus lower costs to ratepayers. With this emphasis on timing, in addition to content, we recommend the following improvements:

1) While improvements in methodologies underpinning the Utility Study, such as those we identify in comment (2) below, coupled with improvements in plans to account for existing gaps, such as those we identify in comments below, should lead to more robust plans, it is inherently risky for renewable project developers to reach commercial decisions based on expectation of future grid expansion plans, even when the likelihood that they will come to fruition is relatively high. There is substantial risk of delays in these plans, and liabilities around in-service dates are generally material for developers but are often not mirrored by the parties constructing network upgrades, attachment facilities, and system facilities. It is therefore important that the definition of "System Upgrade Facilities or System Deliverability Upgrades that are Part of an Expansion Plan of the ISO or Connecting Transmission Owner" addressed in Section 30.12.2.3 of the NYISO OATT be expanded to apply to all Phase 1 and Phase 2 projects,

and that all associated upgrades are added to the NYISO interconnection study base cases for the SRIS and Class Year studies. This would give developers an important backstop in their toolkit to advance various upgrades along the timelines that were reasonably assumed at the time when they made the decision to go forward with development. It is integral that a fair and reasonable framework exists for allowing developers to accelerate already-planned grid investments in cases where there are delays, with developers bearing associated incremental costs. This will lead to lower overall project risks and costs, which will translate into lower costs paid by ratepayers in future solicitations and is therefore a critical design feature.

2) The methodologies employed in the Utility Study can be materially improved upon to ensure that the findings are more robust and comprehensive in future studies. The Initial Report does a thorough job of correctly identifying such areas where improvement can be made, which we will not reiterate in full here. However, we want to echo that it is critical that 'headroom' and its associated benefits are evaluated in terms of both MWs *and* MWhs, across a wide range of resource dispatch scenarios, with consideration for whole-of-system dynamics.

3) At present, the proposals in the Initial Report for expanding local transmission and distribution infrastructure are in many cases late and insufficient and could lead to higher overall system costs by constraining onshore renewable resource development in favorable areas, particularly in the first half of the 2020s when NYSERDA will be entering into long-term contracts to meet 70x30 goals. These plans should be revised accordingly, accounting for updates to methodological approaches as documented in the Initial Report, including but not limited to those references in comment (1) above. **Proposed Phase 1 and Phase 2 projects should be reviewed and, in instances where these projects can relieve constraints in favorable development areas, expedited.** For example, for the Porter/Inghams/Rotterdam area, if one compares the existing headroom estimates to the CARIS figures, one finds a shortfall of around 328 – 448 MW. If the Utility Study findings are taken at face value, this shortfall would be partially eliminated through Phase 1 projects, which are expected to create 150 MW of additional headroom, and entirely eliminated through Phase 2 projects, which are expected to create an additional 510 MW (i.e., 660 MW between both Phases). However, Phase 1 projects would only be completed between 2026 – 2030, while the two Phase 2 projects would be completed in 2026 – 2035 timeframe. This is a long time to wait for these problems to be solved. In a second example, in the western O&R area, if one compares the existing headroom estimates to the CARIS figures, one finds a shortfall of around 214 MW, which would supposedly be entirely eliminated through Phase 1 projects. However, Phase 1 projects are only scheduled to be completed between 2027 – 2036. This sort of analysis should also give consideration for queue volumes, to identify those areas where developer interest is particularly high, which do not in all cases align with the areas that the CARIS study models new renewable development in.

4) Further, additional Phase 2 projects should be identified and developed with an urgency to facilitate more robust development of renewables in favorable areas, as recommended by the Initial Report. The Initial Report did a good job in identifying candidates for these high priority Phase 2 projects—(i) Genesee, Lockport, and Lancaster; (ii) Hornell and South Perry; and (iii) Watertown/Oswego/Porter—where interconnection queue data indicates developer interest that materially exceeded the capacity available on existing and planned system infrastructure. Furthermore, the Initial Report correctly identifies the potential value that Renewable Energy Zones can provide by expanding grid infrastructure under the scope of Phase 2 to previously unserved areas with characteristics that are promising to renewable resource development.

5) While we generally support further exploration of the REZ idea, we do not want it to slow down other identified Phase 1 and Phase 2 projects. Future, we would note that this warrants substantial study and consultation in an inclusive and transparent process before implementation, with consideration of (i) the fundamentals of different regions to inform siting decisions, including factors such as resource potential, existing grid infrastructure in the vicinity, and grid expansion costs; (ii) the framework around capacity rights, including the process for allocating rights and the nature of the rights conferred by dint of allocation, (iii) cost allocation and cost recovery, which would logically be considered more broadly with other Phase 2 projects. The REZ approach should demonstrate clear benefits-to-cost ratios to ensure support from consumers. Furthermore, in other places, REZ efforts have taken multiple years from concept to implementation and involved bulk upgrades. This concept has a lot of potential value for NY, but it is important to continue to pursue such efforts in parallel with prioritizing known grid issues. Based on discussions with local transmission companies, additional grid investments could be made to support development of a larger REZ but that does not negate the need to address low-voltage constraints within that area. For instance, in discussions with National Grid, a collector-345kV system concept could be feasible across several regions including in the Northern zone (area 3 on page 36 of the report) but the local transmission constraints in the area would still need to be addressed to optimize a 345 kV expansion.

V. ADVANCED TECHNOLOGIES

Comments regarding advanced technologies are covered above in the answers to Staff Questions.

VI. OFFSHORE WIND STUDY

The following comments are directed at Part IV. Offshore Wind Study of the *Initial Report*.

Offshore Wind Points of Interconnection

The points of interconnection (POIs) analysis should be updated as soon as possible to reflect the size of existing offshore wind projects that have won NYSERDA awards and the likely size of projects going forward. The OSW study screen analysis identified 36 substations that could accept at least 300 MW of OSW.[17] The four projects that have won NYSERDA OSW bids range in size from 816 to 1,230 MW in size. It is likely due to the significant economies of scale involved that future projects will be at least 800 MW in size and are likely to be larger[18]. Consequently, the study should be updated as soon as possible to recognize the POIs and routes that have already been identified and selected by projects already underway and the likely size of projects going forward.

Offshore Transmission to the Selected POIs

The Integration Study ("the Study") concludes that delivering 6,000 MW into Zone J would require 6 cables (four beyond the two for already contracted OSW) to reach the Con Ed substations in Manhattan and Brooklyn.[19] The Study also notes that routing and permitting these cables will be challenging, but feasible "if researched and planned carefully in collaboration with maritime agencies and stakeholders."[20] Further, the Study highlights the importance of matching cable technology and associated transfer capability to the available routing space into New York Harbor and the optimal capacity of the POIs.[21] In order to ensure that cabling capacity through New York Harbor is maximized, NYSERDA should specify design requirements in future solicitations that would apply to any projects proposing to install transmission cabling through the Harbor. The design requirements would specify the size, number, technology, and capacity of the cabling. Prior to establishing such design requirements, NYSERDA should solicit input from a wide variety of stakeholders including offshore wind developers, cable manufacturers, environmental organizations, marine users and other relevant state agencies.

Offshore Wind Meshed Transmission System

The Offshore Wind Study concludes that "a "meshed' design is the most flexible and can adapt to the availability and locations of future wind energy lease areas (WEAs) due to the fact that each WEA will also have a dedicated radial line."[22] Further, the study observes that "[f]or a networked

[17] Ibid, page 60
[18] The most recent NYSERDA solicitation resulted in awards to two projects: Empire Wind 2 at 1260 MW and Beacon Wind at 1230 MW.
[19] Ibid, page 60.
[20] Ibid, page 60.
[21] Ibid, page 60.
[22] Ibid, page 60.

design to be economically justifiable…,[it] should encompass at least three OSW projects with minimum aggregate rating of approximately 3 GW," and also that "[a] Radial connections can be later converted to Mesh or Backbone with upfront preparation and investment."[23] Although the potential benefits of a meshed system are well documented, such a system is inherently complicated and should continue to be aggressively evaluated.

The Offshore Wind Study recommends that OSW facilities with radial transmission include the option for being later integrated into a meshed, more resilient offshore network. Further, it suggests that bidders in NYSERDA procurement be asked to include alternative bids with larger offshore transmission platforms that can accommodate the interconnections and substation configurations necessary to create a meshed network that can be used to disconnect individual gen ties and re-route the output from the directly interconnected wind generation to the rest of the meshed network.[24] Prior to the inclusion of a requirement in an RFP to include such alternate bids, NYSERDA needs to clearly develop technical requirements, responsibility among parties for operations and maintenance, cost sharing and cost recovery and ownership structures.

An alternative to including a meshed system alternative in future OSW solicitations would be to advance such a system through the NYISO public policy process (PPTNPP). This would allow third party transmission developers to develop innovate proposals for a meshed system which would then be evaluated to determine feasibility and cost effectiveness. Since NYSERDA is expected to issue a series of OSW solicitations over the coming years to meet the CLCPA requirement for 70% by 2030, the NYISO should work with NYSERDA to expeditiously establish the guiding parameters for the meshed system and have the market submit proposals. However, given the requirements and timetable for implementation of the CLCPA, the design and implementation of a meshed system should not, as noted earlier, delay future OSW solicitations. We recommend that the Commission identify the meshed offshore wind network as a public policy need as soon as possible, in the current PPTNPP. This process can proceed on a parallel path to the NYSERDA procurement process.

Bulk Transmission Needs and Potential Projects for OSW

"The Offshore Wind study concludes that "9,000 MW of offshore wind generation can be integrated without requiring major bulk transmission upgrades…"However, that conclusion is based on a number of optimistic assumptions including the interconnection of 6,000 MW into Zone J, well- coordinated system development, low congestion and curtailments and reliability needs defined by summer peak load conditions. The assumption that only 3,000 MW will be

[23] Ibid, page 61.
[24] Ibid, page 75.

connected to Long Island is not realistic when considering the vast majority of the MW for the awarded projects are connected to Long Island. Given the number of conditions that must align to avoid major bulk transmission upgrades, the study concludes that "…it becomes valuable to pre-emptively address the problem by adding transmission infrastructure, the need for which is *almost inevitable* as the State looks beyond it 9 GW minimum target and considers pathways to deepening carbonization consistent with the goals of the CLCPA…".(emphasis added)[25] Further, the study states that "The need for a new tie line may be inevitable in a future where offshore wind plays a significant role in New York's downstate grid."[26] The Study goes on to recommend that planning for an expansion of the export capacity from Long Island by 2030 should start right away and suggests that the NYISO Public Policy Planning Process offers an effective mechanism for identifying competitive solutions to transmission needs.[27] We agree and support the Commission identifying this specific need (enhanced export transmission capacity on Long Island) in the current PPTNPP under FERC Order 1000 that is currently underway.

Continued Planning, Coordination and Studies

The Initial Report recommends numerous areas of further analysis and study that should be undertaken to help determine transmission priorities, costs and other information that will accelerate the transmission upgrades and improvements necessary to ensure that at least 9,000 MW of offshore wind can be injected into the downstate grid. We strongly agree and highlight the following areas that require further examination.

- Storage - The Study assume that significant amounts of battery storage will be located and developed in the downstate region (3,000 MW by 2030 and 15,500 MW by 2040). Since the Study indicates that much more storage will be necessary than required by the CLCPA, NYSERDA should establish a higher goal in the State Energy Plan and develop a strategy to achieve it.
- Feasible Siting and Permitting – The Study focuses on the injection of 6,000 MW of offshore wind into Zone J and 3,000 MW into Zone K but acknowledges that it may be difficult to accomplish this split given the challenges of siting cables in NY Harbor and to related onshore infrastructure (e.g. substation) Additional analysis of both the offshore and onshore transmission systems is necessary to ensure that the system is optimized when all of the costs and benefits of injections into Zone J and K are considered.

[25] Ibid, page 71
[26] Ibid, page 72.
[27] Ibid, page 73.

- Use of Retiring Fossil Fuel Plants – The Study suggests that the using the interconnection capacity of retiring fossil fuel plants might mitigate the overall challenge of finding POIs that are jointly feasibly without major transmission upgrades.[28] The PSC should aggressively explore this option given the mandates and implementation timetable of the CLCPA.

- Creation of Clean Energy Hubs – Con Ed suggests that the creation of two "Clean Energy Hubs" could address reliability needs and space limitation for adding necessary interconnection equipment in Zone J.[29] This option should also be carefully and expeditiously examined given the challenges of siting and constructing infrastructure in Zone J. We support further examination of this option. We also support examination of this approach for use in Zone K. Further, as analogous to the Renewable Energy Zones concept for land-based wind and utility-scale solar, this concept should be considered via the declaration of public policy needs under FERC Order 1000 as a potential option, with the private sector encouraged to bring forth proposals that use this approach.

- Interregional Links – When exploring the options for a meshed system, the Study briefly discusses the possibility of creating interregional links between NYISO, PJM and ISO-NE.[30] As part of the further evaluation of a meshed system, we encourage additional analysis of the potential for these interregional links. These interconnections have the potential to increase reliability, improve and stabilize revenue generation and lower costs to ratepayers as more and more wind farms come online. When the Commission identifies the need for a meshed system as a public policy need in the PPNTPP, it should identify an interregional link as an option for the design to encourage proposals by the private sector to address that need.

Sequencing of Next Steps

NYOWA and ACE NY recommend a series of actions under the umbrella of "further study," as discussed above. To summarize and sequence these steps:

1. As soon as possible, the Offshore Wind Study should be amended to include a scenario where points of interconnection reflect the likely needed size and capacity of contracted projects, as discussed above.

[28] Ibid, page 65.
[29] Ibid, page 66.
[30] Ibid, page 69.

2. Also as soon as possible, the Commission should identify at least three specific public policy needs associated with offshore wind development in the current PPTNPP. One should address the need to expand the capacity to export power off Long Island. The second should address the need to develop an offshore meshed transmission system, with the option of including an interregional connection. The third should be the need to identify and develop one or more clean energy hubs in Zone J and one or more clean energy hubs in Zone K. This step is designed to identify discreet needs and encourage diverse proposals to address them through the PPTNPP. In this way, the PPTNPP can be proceeding even as progress is being made on designating WEAs or otherwise updating the Offshore Wind Study portion of the NY Power Grid Study.

3. After the CES Tier 4 projects are selected and BOEM identifies new WEAs, the Commission should again update the Offshore Wind Study to reflect the changed landscape.

4. The next NYSERDA Offshore Wind RFP should not be delayed in response to the Offshore Wind Study and should proceed expeditiously. After such time as the Commission has made a final determination that New York should definitely pursue a meshed system for offshore wind transmission, even if that system is not fully defined, the RFP could be modified to require either additional information regarding how a proposed project will support the development of that meshed system or require alternative bids for a radial vs. meshed connection for the proposed project.

VII. ZERO EMISSIONS STUDY

Our comments on the Zero Emissions Electric Grid by 2040 are focused on storage.

New York has set the goal of deploying 3,000 MW of energy storage by 2030, with the interim target of 1,500 MW by 2025. The Zero Emission Study finds a need for over 15 GW by 2040. These figures are large; very little energy storage has been deployed in New York to- date. For this volume of energy storage to materialize -- along with the more precise energy storage deployments identified in the Zero Emission Study as having a critical role in 'unbottling' location-specific congestion issues in the future – there need to be policy changes to the status quo. DPS Staff and NYSERDA should, among other things, undertake a review of current frameworks relevant to energy storage development and consider the need for proceedings to evaluate reforms, including on issues such as:

- Participation arrangements for 'co-located' or 'hybrid' energy storage resources in NYISO today are problematic. While NYISO is actively studying this issue and means to publish new market rules this year that will update the participation model for co-located storage in the market, it will be critical that they 'get these right' given the pivotal role that storage is expected to play in the future low-carbon, high-variable renewable energy resource power sector. Further, further exploration of the role and feasibility of long-term storage is important as New York moves beyond 70% renewable resources.
- Capacity and ancillary services market reforms will also be an important factor in realizing a high-storage future, as some of the most important value propositions and compensation opportunities for energy storage resources.
- Future solicitations and procurements should also be adapted to account for the market need for storage, offering contracts that are both financeable and performance-based for stand-alone and hybrid energy storage resources, without inadvertently or inappropriately precluding 'value-stacking' opportunities for these resources.
- Finally, the role of storage in providing grid services as a 'non-wires alternative' will be important going forward. The Initial Report recommends more coordinated planning across traditional grid infrastructure and alternatives such as storage. The Zero Emissions Study identified storage as an effective means of avoiding more substantial transmission upgrades in certain cases. It will be critical to define how NWAs will be considered in the planning process, with evaluation on a technology-neutral basis that incorporates the ability of certain alternatives to provide multiple services (e.g., 'value-stacking' by energy storage), and to design a framework for bringing these resources into service and compensating them in a fair and financeable fashion.

VIII. OVERALL POWER GRID STUDY FINDINGS

As the Commission proceeds with the development of transmission upgrade plans, ACE is focused on ensuring that existing renewable generators, contracted resources, and to-be-contracted resources all have access to the transmission and distribution systems without curtailment of energy output. The Commission reinforced that point as recently as its March 18, 2021 Order Addressing Public Policy Transmission Needs, issued in cases 20-E-0497 and 18-E-0623. In this Order, it prescribed criteria to assist NYISO in its "solicitation and evaluation of proposed solutions to the identified Public Policy Transmission Needs," including "transmission congestion, impacts on transfer limits; and resource deliverability." (PSC Order at 24.) Projects under consideration in future solicitations must also be deemed deliverable to be awarded without impacting existing and awarded projects. It is well-established that significant transmission upgrades are required to

achieve the CLCPA mandates in the most cost-effective manner. This proceeding provides the critical roadmap to chart that development effectively. Taken together with the NYISO PPTNP processes and NYPA's Priority Transmission Planning processes, ACE urges the Commission to coordinate efforts under these three components and direct the development and implementation of a transmission plan with defined projects and associated timelines that will ensure deliverability of renewable energy to consumers across New York State as new renewable projects come online. To ensure the system is built out in a manner that will allow the CLCPA mandate to be implemented effectively, the Commission must ensure existing and contracted projects are not negatively impacted by new awards and develop transmission plans that account for the deliverability of existing, contracted, and future renewable projects.

IX. CONCLUSION

On behalf of the Alliance for Clean Energy New York, the New York Offshore Wind Alliance, the American Clean Power Association, and the Advanced Energy Economy Institute, we appreciate the opportunity to comment on the *Initial Report on the New York Power Grid Study.*

It is commendable that the State of New York is examining transmission needs through the lens of the imperative to achieve the mandates of the CLCPA, and we look forward to continuing to work with the Commission and other New York state agencies on the refinement and implementation of the recommendations of this Initial Report.

We respectfully urge the Commission to distinguish between transmission needs related to land-based wind and solar, and those related to offshore wind development. Needs related to land-based wind and solar require immediate prioritization of a good set of transmission upgrades to enable successful completion of many contracted renewable projects and awarding of new contracts at the least cost to ratepayers. There is urgency for the Commission to allow for transmission solutions for land-based wind power and utility scale solar projects to be prioritized and approved, as renewable projects in late-stage development or with contracts awarded may be hesitant to move forward due to the curtailment and congestion risk. Offshore needs have a slightly longer timeline and there is time for additional studies and considerations as discussed above. Offshore wind RFPs should not wait for decisions on a meshed system, but decisions about the meshed system are critical and timely as well.

Accordingly, we support approval of Phase 1 projects ASAP. With respect to Phase 2 projects, the Commission should identify the top congested areas as priority for investment and identify winning solutions before the end of 2021 in order to give certainty to the market that areas with

significant congestion risks are being addressed with a clear timing. The priority areas could include the three areas identified (pages 35-36 of the report) with the remaining based on the congestion risk, cost of Phase 2 upgrades, and NYSERDA awards in the region.

By declaring a need in the current PPTNPP – for both offshore wind and upstate renewables -- the Commission will allow for market proposals to address congestion in prioritized areas to come forward. Such proposals could combine Phase 2 upgrades with bulk solutions and could be proposed and done in coordination with local transmission companies. The Renewable Energy Zone (REZ) concept should also be considered as part of this PPTNPP. But given the lead time associated with studying and identifying REZs, the Commission should not put on hold declaring public policy needs or approving Phase 2 projects in priority areas first.

As we have pointed out earlier, while the Initial Report suggests that grid investments via Phase 1 upgrades might enable meeting of the CLCPA targets by 2030, there are questions regarding several key modeling decisions, such as assuming a median dispatch for renewable projects (Initial Report, page 26) or ignoring of the low-voltage constraints in the bulk study. These questions – and the ambitious goals of New York's CLCPA – imply that a conservative approach should be taken to transmission planning and that further assessment is warranted. Indeed, the pace of changing circumstances means that almost continuous and ongoing assessment of transmission needs should be pursued in the next several years as we continue to procure renewable projects and learn more about their location and size. As New York's approach to transmission planning continues to evolve in the context of the CLCPA goals, it would make sense that the cost/benefits analysis framework used to evaluate or approve any transmission project would account for safety, reliability, resilience, the need to replace aging infrastructure, the need to deploy emissions-free technologies, and the need to minimize curtailment and congestion of renewable power. All of these attributes of proposed projects should be assessed.

The PPTNN process and the Article 7 process should be streamlined further to speed up identification, solicitation, and approval of transmission projects as discussed earlier in the comments, and advanced technologies should be pursued as discussed, including the incentives for utilities to implement advanced technologies and the process steps to allow other parties to identify and propose advanced technologies.