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**COMMENTS OF THE NEW YORK INDEPENDENT SYSTEM OPERATOR, INC.
ON NEW YORK STATE CLIMATE ACTION COUNCIL DRAFT SCOPING PLAN**

I. Introduction

The Climate Leadership and Community Protection Act (“CLCPA”) will transform New York’s energy economy and landscape. The NYISO, through our mission to maintain and enhance power system reliability and operate open competitive wholesale electricity markets for New York, will provide steadfast support throughout this transition. The NYISO values the opportunity to provide comments on the New York State Climate Action Council’s (“Council’s”) Draft Scoping Plan¹ as an important step toward achieving the CLCPA’s ambitious goals.

New Yorkers have long enjoyed reliable electric service and will expect the same level of service to continue into the future. Reliable, on-demand electric service supports every aspect of New Yorkers’ daily lives and is vital to the state’s economy. A diverse resource mix that integrates sufficient levels of predictable, reliable, and dispatchable generators currently promotes grid resilience and minimizes the risk of power disruptions. This resilience is increasingly important as extreme weather conditions place power systems across the nation at risk of not reliably serving electricity customers. Any blackouts, or electric service interruptions, would disrupt normal life and have a significant impact on public health, welfare, and safety. The future non-emitting resource mix will need to include sufficient predictable, reliable, and dispatchable resources to maintain the level of service New Yorkers expect as a greater share of electricity is supplied by intermittent resources and more electricity is used for multiple other sectors of the economy, such as building heating and transportation.

The NYISO recognizes that the CLCPA will drive a dramatic shift in how electricity is produced, stored, transmitted, and consumed throughout New York State. The CLCPA will result in the addition of significant renewable generation, storage, transmission, and electric consumption shifts. In addition, the CLCPA will drive the retirement or reduced operation of carbon dioxide emitting generation (*i.e.*, largely fossil fuel-fired generators, referred to herein as “fossil generators”). Today,

¹ New York State Climate Action Council Draft Scoping Plan, December 30, 2021, available at, <https://climate.ny.gov/Our-Climate-Act/Draft-Scoping-Plan>.

these same generators provide the vast majority of flexible, dispatchable electricity that is critical to meeting the needs of daily life and maintaining electric system reliability around the clock. Fossil generators supply significant electricity for consumers and protect system reliability by responding quickly to rapid system changes. Achieving the CLCPA mandates and maintaining the reliability and resilience of the electric system demand that the NYISO, electric-system stakeholders, and state agencies work collaboratively to plan for the reduced operation of existing electric generators and, at the same time, develop and integrate the types of resources needed to maintain the reliable electric system that consumers require.

The NYISO is fully committed to reliably achieving the transition established by the CLCPA and supports many of the recommendations of the Draft Scoping Plan. Since the CLCPA was enacted in 2019, the NYISO has taken steps to better understand and prepare for the reliability, operational, and market implications of such a transformation in the resource mix operating within the state. In late 2019, the NYISO released a report, *Reliability and Market Considerations for a Grid in Transition*,² its “Grid in Transition Report.” In 2020, based on the considerations described in its Grid in Transition Report, the NYISO released two important studies, *New York’s Evolution to a Zero Emission Power System*³ and *Climate Change Impact and Resilience Study*.⁴ These studies, along with the Comprehensive Reliability Plan published in 2021,⁵ help inform the NYISO, stakeholders, and policymakers about the operational, reliability and investment implications of transitioning to a zero emissions grid by 2040. The Grid in Transition Report effort frames the NYISO’s approach to evolving its market design to accommodate new resource types and changing electricity consumption patterns, including the NYISO’s consideration of enhancements to the energy and ancillary services markets.

The NYISO’s recent *Climate Change Impact and Resilience Study* modeled New York’s grid based on projected 2040 load levels and the requirement that electricity supply be zero-emitting.⁶ The study demonstrated that reliable service to consumers requires access to sufficient generating capacity that satisfies the CLCPA zero-emission mandate while offering controllable output and the capability to supply the system for extended periods of time. The Draft Scoping Plan acknowledges that dispatchable and emissions-free resources will be needed to balance the system and must be significant in capacity, be able to come on-line quickly, and be flexible enough to meet rapid, steep ramping

² Grid in Transition Report - <https://www.nyiso.com/documents/20142/2224547/Reliability-and-Market-Considerations-for-a-Grid-in-Transition-20191220%20Final.pdf>.

³ *Evolution to a Zero Emission Power System* - <https://www.nyiso.com/documents/20142/13245925/Brattle%20New%20York%20Electric%20Grid%20Evolution%20Study%20-%20June%202020.pdf>.

⁴ *Climate Change Impact and Resilience Study* Official Phase II Report - <https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase-2-Report.pdf>.

⁵ The Comprehensive Reliability Plan specifically included a section “Beyond the CRP – Road to 2040”. <https://www.nyiso.com/documents/20142/2248481/2021-2030-Comprehensive-Reliability-Plan.pdf/99a4a589-7a80-13f6-1864-d5a4b698b916>. See also, <https://www.nyiso.com/documents/20142/26735166/CRP-Study-Examines-Power-Grid-Reliability-Risks.pdf/b34771e4-7f34-aea5-d277-52e9a5966adc>.

⁶ *Climate Change Impact and Resilience Study* Official Phase II Report - <https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase-2-Report.pdf/e9214fd4-9c52-036d-b92b-15f282e686e6>.

needs.⁷ The NYISO generally describes the required generating attributes as flexible, long-duration, and controllable. Development and integration of these resources will be critical to meeting consumers' electricity needs, avoiding blackouts, and maintaining system reliability 24 hours a day seven days a week. The need for these resources can range from momentary to multi-day events. These resources also need to be able to change output quickly in response to system conditions, known as "ramping," to maintain electric system reliability. Today, natural gas-fired and other conventional generators support electric system reliability by providing much of this flexible, controllable energy.

The NYISO's analysis of future clean-energy scenarios concludes that maintaining reliability on the grid of the future will require significant amounts of dispatchable and emissions-free resource capacity to balance load changes and variability of electricity production associated with the intermittency of renewable resources. Decarbonization of the electric system in the state by simply deactivating existing generation without having in place resources capable of providing comparable reliability services would risk the reliability of the electric system. To facilitate a successful transition, careful consideration must be given to replacing the reliability attributes of the existing fleet of generation with clean energy resources.

Until adequate levels of non-emitting resources are connected to the grid to provide these services, a significant level of existing dispatchable generation must remain available to meet reliability standards and maintain electric system reliability. At the same time, as long as the NYISO has sufficient certainty and notice of when generators will retire or be required to reduce operation, its reliability planning processes will have the opportunity to identify system needs and seek CLCPA-consistent solutions to provide an orderly and reliable transition. NYISO's reliability planning processes evaluate reliability needs that are arising due to the changing resource mix. This includes the reduced availability of flexible generating units and the corresponding increase of new renewable, intermittent generation. Since passage of the CLCPA in 2019, generation is retiring faster than new resources are entering the system. While this shift has been underway for some time in New York, electric system margins are now decreasing to unprecedented levels. These margins measure the amount of generating capacity in excess of the absolute minimum needed to maintain reliability. The margins are fast approaching the point when new resource entry, with the ability to provide necessary reliability services, will be required before additional emitting generation can shut down. The CLCPA envisions this new resource entry; the challenge before all of us is to coordinate the required resource retirements with the entry of new resources.

To meet these reliability challenges, the NYISO is also reviewing its wholesale market rules and the related electric system reliability rules needed to reliably operate the electric system and to facilitate the orderly transition of replacement resources by providing investment and resource retention incentives consistent with the reliability needs. Given the challenges in managing the clean energy transition, the NYISO applauds the focus on reliability in the Draft Scoping Plan and the CLCPA statute itself. This transformation of the power grid necessitates the orderly and predictable reduction in the operation and eventual deactivation of the remaining fossil generators and the introduction of new resources with the right attributes to maintain uninterrupted electric service.

⁷ See Draft Scoping Plan at p. 170. These resources are referred to as "Dispatchable Technologies" within the Draft Scoping Plan. See Draft Scoping Plan at p. 177.

II. NYISO's Roles and Responsibilities for Electric System Reliability

The NYISO is the not-for-profit corporation responsible for operating the power grid in New York, planning for the future of the power grid, providing non-discriminatory access to transmission service, and administering wholesale markets for electricity and transmission products in New York. The NYISO manages the flow of electricity across more than 11,000 miles of high-voltage transmission lines serving New York on a minute-to-minute basis, balancing supply and demand throughout the state. The NYISO operates in accordance with tariffs, accepted by the Federal Energy Regulatory Commission ("FERC"), to administer open and non-discriminatory access to the electric grid, competitive cost-minimizing markets for the sale and purchase of energy and capacity,⁸ and payments for ancillary services⁹ necessary for the reliable operation of the bulk electric system.

To maintain electric system reliability, the NYISO's planning process continuously analyzes resource adequacy and transmission security, so that there are enough generation resources and transmission facilities to serve expected consumption and reliably operate the grid. The NYISO plans the bulk electric system to meet the performance requirements under the mandatory reliability standards of the North American Electric Corporation ("NERC"), the Northeast Power Coordinating Council ("NPCC"), and the New York State Reliability Council ("NYSRC"). These reliability standards are enforceable under federal and state law. Together, these standards comprise the nation's strictest set of reliability standards designed to promote reliability for New York consumers, including specific reliability rules for the New York City metropolitan area. Violating these mandatory standards results in reliability needs and jeopardizes the reliable operation of the electric system, including delivery to consumers.

One of the primary ways that the NYISO publicly carries out its analysis is through its biennial Reliability Planning Process. The first part of the process is the Reliability Needs Assessment ("RNA"), which identifies any reliability deficiency issues over the next ten years, and the second part is the Comprehensive Reliability Plan ("CRP"), which provides the plan to maintain reliability for the ten-year horizon.¹⁰ If reliability needs are identified in the RNA, then the CRP will include the results of a solicitation for market-based and backstop regulatory solutions to address those needs. Solutions can take the form of any generation and resource type, including demand response and storage, as well as new local and bulk level transmission solutions. The reports for each of these processes are reviewed with stakeholders and posted on the NYISO website. In addition, the NYISO also performs quarterly reliability assessments that focus on the near-term years and posts a report for each assessment. If needs are identified in the next three years, the NYISO solicits market-based solutions

⁸ Capacity is the capability to generate or transmit electrical power, or the ability to control demand at the direction of the NYISO, measured in megawatts ("MW").

⁹ Other necessary services generally refer to some or all of the Ancillary Services defined in Section 2.1 of the NYISO's Market Administration and Control Area Services Tariff. They are services necessary to support the transmission of Energy from Generators to Loads, while maintaining reliable operation of the NYS Power System in accordance with Good Utility Practice and Reliability Rules. Ancillary Services include Scheduling, System Control and Dispatch Service; Reactive Supply and Voltage Support Service (or "Voltage Support Service"); Regulation Service; Energy Imbalance Service; Operating Reserve Service (including Spinning Reserve, 10-Minute Non-Synchronized Reserves and 30-Minute Reserves); and Black Start Capability.

¹⁰ 2021-2030 Comprehensive Reliability Plan - <https://www.nyiso.com/documents/20142/2248481/2021-2030-Comprehensive-Reliability-Plan.pdf/99a4a589-7a80-13f6-1864-d5a4b698b916>.

from developers and backstop regulatory solutions from transmission owners to maintain reliability if market-based solutions are not available.

These NYISO reports provide insight to federal and state regulators, reliability organizations and investors regarding the reliability impacts of environmental regulations and policies impacting power generation resources in New York. Through these processes, the NYISO continuously monitors and reports on the development and implementation of environmental regulations and policies impacting power generation resources in New York based on its mandate to maintain reliability for the state's bulk electric system.

III. NYISO Comments on the Draft Scoping Plan Recommendations

A. Power Generation Strategies

The Draft Scoping Plan describes the significant power sector transformation necessary to meet the Climate Act's requirements of 70% renewable electricity by 2030 and zero emissions electricity in New York State by 2040. With natural gas currently being the principal fossil fuel source for electric generation in the state, the Draft Scoping Plan recognizes that New York must deploy clean energy resources such as land-based wind and solar, offshore wind, hydropower, fuel cells that use renewable fuels, and storage. The role nuclear power plays in serving New York's energy needs and the importance of evaluating its contribution going forward is highlighted. The Draft Scoping Plan goes on to acknowledge that the orderly transition from natural gas-fired, and other fossil fuel-fired, electric generation to emissions-free generation is fundamental to protecting electric system reliability. The orderly transition discussion highlights the need for new dispatchable and emissions-free resources, or dispatchable technologies.

The Draft Scoping Plan highlights what is at stake as more sectors of the economy transition to rely on electricity and electric generation transitions away from natural gas:

While transitioning away from carbon-based energy sources, maintaining reliability of the energy system is crucial. Reliable electricity production is critical to maintain good public health in our energy dependent society. Increasing the reliability of the electric grid can reduce health effects during high temperatures, when air conditioning is the principal means to prevent heat-related morbidity and mortality. During summer, power outages pose specific health-related impacts such as: (1) spoiled food and digestive tract illness; (2) spoiled vaccines; and (3) increased rodent populations as a result of discarded perishables. Winter outages also pose specific risks to public health such as carbon monoxide. Following a 2006 winter storm in Western New York, 264 people were diagnosed with carbon monoxide poisoning. After Hurricane Sandy, 80 carbon monoxide poisoning cases were reported. At least 57 deaths were attributed to this weather event, and there was over \$195 million in property damage. By improving the reliability of the grid, the State can

prevent millions of dollars in damages and prevent premature mortality.¹¹

The Draft Scoping Plan goes on to state:

During the grid transition, several reliability challenges must be successfully managed including resource and resource attribute variety and the anticipation of changing load needs and patterns. Continual study of needs through the NYISO's Comprehensive System Planning Process and expansion of the transmission system to relieve constrained generation pockets will be needed to help increase electric grid reliability during the transition.¹²

Generation resources combined with the transmission and distribution systems, control centers, and wholesale markets provide a continuously operating, reliable system to service New York's electric needs. All of these elements will need to transition and come together effectively to manage the transitioning grid to provide continuity of a reliable power system, while implementing the goals of the Climate Act.¹³

The NYISO is committed to supporting a responsible transition that achieves the CLCPA mandates and looks forward to offering its expertise and supporting careful consideration to each step along the way. The reliability attributes of the existing generation fleet must be replaced as traditional generators retire and clean resources come online. The performance capabilities associated with these generator reliability attributes enable predictable and reliable electric service. These same reliability attributes must exist on the clean grid of the future to continue the reliable service that New Yorkers expect. The NYISO's planning processes, various studies, and electric-system expertise can and should be utilized by the state to facilitate a successful transition.

1. Fossil Generator Retirements Must Be Coordinated with Replacement Resources

According to the Draft Scoping Plan, New York should have a detailed process in place to ensure that the fossil generators are "gradually and safely retired,"¹⁴ while maintaining electric system reliability – an approach that the NYISO strongly supports. NYISO's ability to facilitate a reliable electric system, including delivery to consumers, requires that the introduction of new resources be coordinated with and occur prior to the orderly retirement of any existing generators. This order of operations is critical for maintaining reliability after such retirements. Electric system reliability margins are already close to minimum reliability requirements in certain areas across New York and are tightening. If these margins are totally depleted, the reliability of the grid would be at risk and

¹¹ Draft Scoping Plan at p. 61 (footnotes omitted).

¹² Draft Scoping Plan at pp. 169-170.

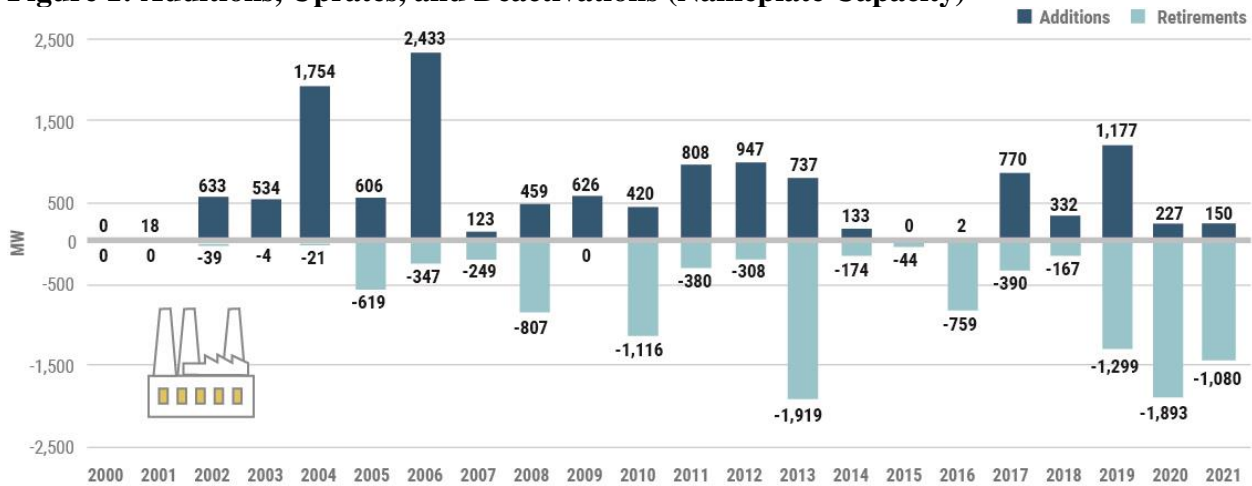
¹³ Draft Scoping Plan at p. 169.

¹⁴ See Draft Scoping Plan at p. 155.

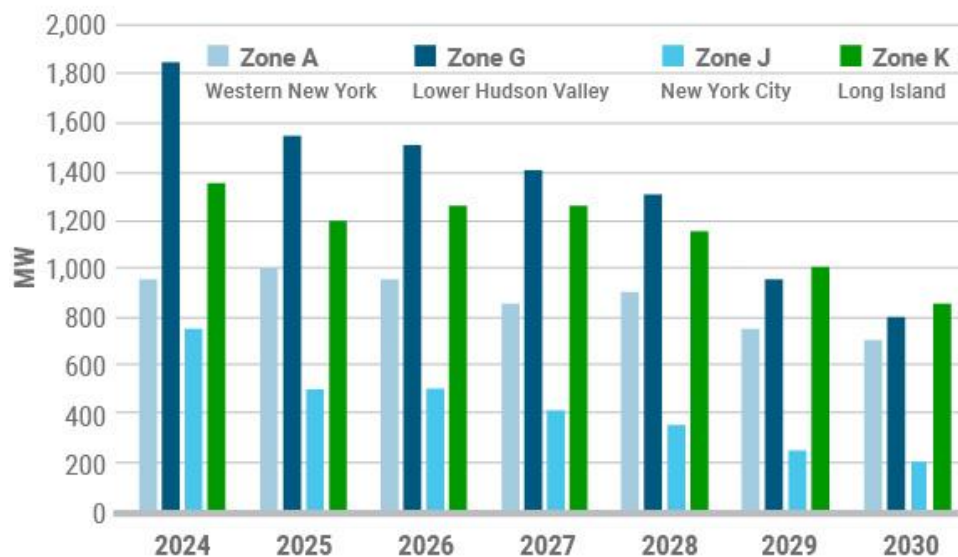
power outages could disrupt normal life or negatively impact public health, welfare, and safety.¹⁵ As the NYISO recently reported in the 2021-2030 Comprehensive Reliability Plan and the 2021 Quarter 4 Short-Term Assessment of Reliability, the New York grid may not have the transmission system and generation resources to reliably serve electric demand in the future.

The figures below demonstrate the trend of shrinking reliability margins. Figure 1 shows how resource retirements are beginning to outpace resource additions, notably over the last three years. Figure 2 depicts how this trend is leading to tighter reliability margins in the coming years. While the state’s bulk electric system meets current reliability requirements, risks to reliability and system resilience remain. One key factor driving this risk continues to be resource retirements outpacing additions.

Figure 1: Additions, Upgrades, and Deactivations (Nameplate Capacity)



¹⁵ Federal and state reliability regulators expect the NYISO to comply with applicable reliability requirements to mitigate such risks to the power grid.

Figure 2: Zonal Resource Adequacy Margins: 2024-2030

A sufficient fleet of new generation resources that satisfy the CLCPA, with the appropriate reliability attributes, *must* be available *before* the existing, traditional generators retire voluntarily or are forced out of service. An essential step to facilitate the orderly transition from traditional generators to emission-free electricity is promulgation of environmental regulations with defined milestones and ample lead time for new resource development. For example, firm regulatory milestones that define emission limits to be achieved on specified dates and compliance plan obligations that require generators to describe their approach to compliance give the NYISO planning processes essential information to consider and share with stakeholders.

Proposing environmental regulations with defined milestones to facilitate the CLCPA mandates would help protect electric system reliability by allowing the existing reliability processes to more accurately review and evaluate reliability needs. The Draft Scoping Plan provides that the DEC should assess regulatory options to reduce emissions from fossil generators to the maximum extent practicable to achieve the requirements of the CLCPA while maintaining electric system reliability. The DEC should examine all potential regulatory options, including *new regulations* and/or permit requirements or amendment of current regulations and/or permitting requirements, to determine the most efficient, effective, and enforceable format to achieve the determined emissions reduction targets and the CLCPA requirements. The process should include effective mechanisms for input and comments from stakeholders *prior to a formal proposal* under the State Administrative Procedures Act, similar to the process used in promulgating the DEC “Peaker Rule,” 6 NYCRR Subpart 227-3.¹⁶

The NYISO strongly encourages the DEC and other state agencies to pursue new or amended regulations to implement emissions reductions in an orderly, predictable manner. The process should include effective mechanisms for input and comments from stakeholders prior to a formal proposal. This exact approach proved effective when the DEC developed the Peaker Rule in 2018-2019. When

¹⁶ See Draft Scoping Plan at pp. 156-157.

the DEC issues draft regulations prior to formal proposals, the NYISO and other interested stakeholders can immediately evaluate potential electric system impacts. The conclusions from such evaluations can shape effective environmental regulations that support the DEC's objectives without jeopardizing electric system reliability.

This approach allows the NYISO to include the effects of regulations in its reliability planning processes to address any reliability needs before generation would retire under the new regulations. Such regulations should include specific regulatory milestones, *e.g.*, compliance plan due dates or new emission limit effective dates, with sufficient lead times to allow review in the NYISO's long-term Reliability Planning Process (*i.e.*, at least four years). Moreover, such regulations should include a reliability safety valve to allow retiring generators to continue to operate while necessary non-emitting generators, storage resources, and the transmission infrastructure are completed.¹⁷

Consistent with the NYISO's evaluation of the Peaker Rule, as environmental regulations drive the reduction of fossil generation, the NYISO's reliability planning processes remove generators that have indicated their intent to deactivate, or to reduce operations, including modeling as "out-of-service" generators that lack authority to operate in their current equipment configuration past a date certain (*e.g.*, due to a new or amended environmental law or regulation). This process allows market-based and regulated reliability solutions of all types, including generation, transmission, and demand-side measures, to be identified, timely permitted, constructed and enter service. As contemplated in the Draft Scoping Plan, this approach would encourage developers to explore storage, transmission upgrades or new construction, energy efficiency, demand response, or other zero-emissions resources as market-based solutions to reliability needs.¹⁸ If no replacement generator or other solution is available to timely address the need, the NYISO would then rely on an existing generator to continue operating to address the need until a permanent solution can be built.¹⁹ This approach should be adopted to allow the NYISO to identify generation that will be unavailable under CLCPA requirements and to model their electric system reliability impacts. Such a process would provide the most efficient path to soliciting solutions to facilitate fossil generator retirement consistent with the CLCPA and electric system reliability.

2. Accelerate Growth of Renewable Generation and Other Resources

New resources will be necessary to serve load and provide reliability services in place of the generators that will retire. The Draft Scoping Plan contemplates accelerating the growth of large-scale renewable generation, offshore wind generation, distributed generation, and distributed energy resources. This growth is envisioned, in part, through recommendations that the state accelerate adoption of innovative technologies and programs that increase hosting capacity such as flexible interconnection, hybrid systems, and coupling resources with energy storage or controlled load.²⁰

¹⁷ See *e.g.*, 6 NYCRR Part 227-3.6 (a generating resource that plans to deactivate but is needed for electric system reliability "may be designated as a reliability source by the NYISO or by the local transmission/distribution owner to temporarily resolve a reliability need" and "may continue to operate without complying with the applicable emissions limits of this Subpart until" other specified conditions are met.).

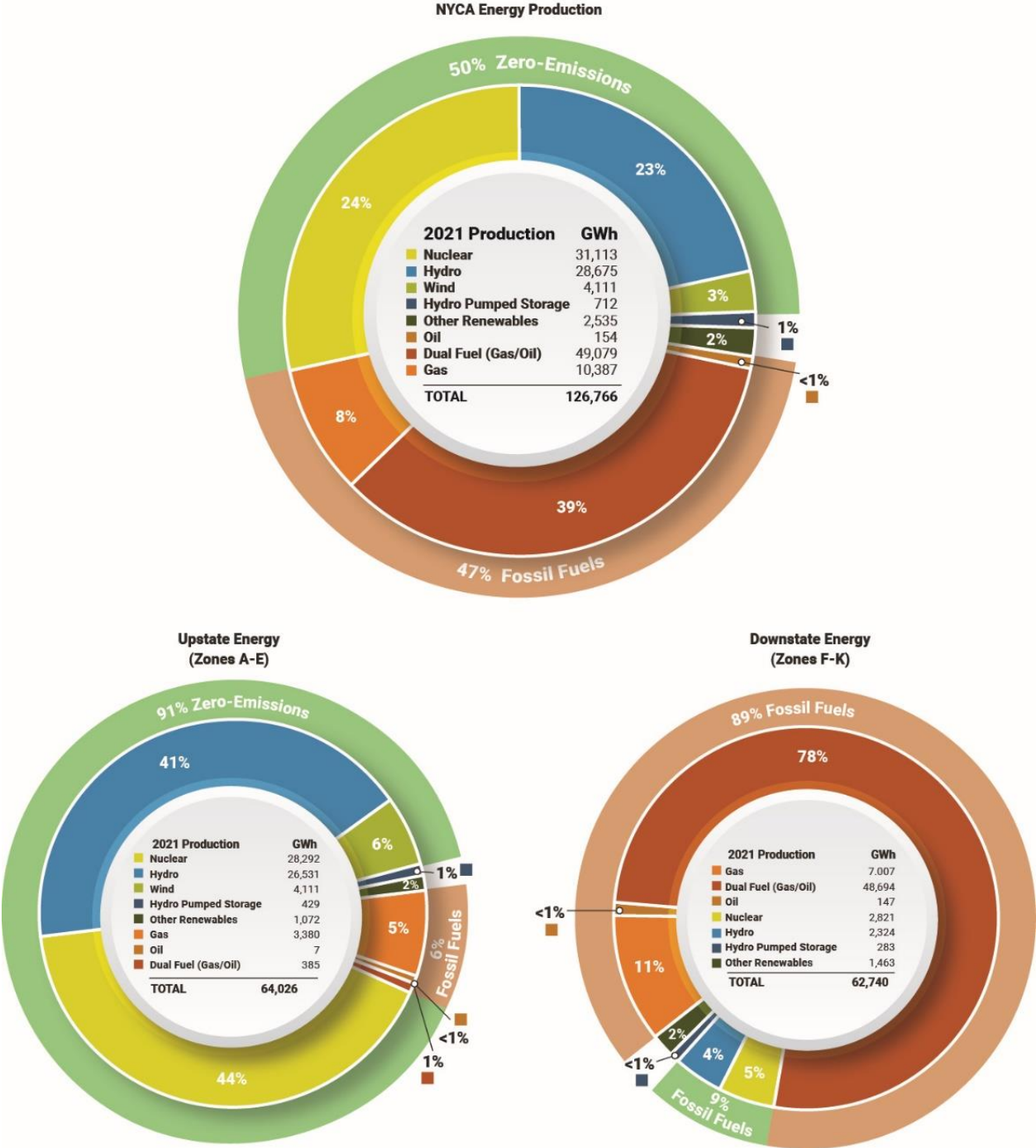
¹⁸ See Draft Scoping Plan at p. 155.

¹⁹ If existing generators are required to remain in service and no replacement generation emerges, the state may be forced to rely on old, inefficient fossil generators. See the 2021-2030 Comprehensive Reliability Plan at p. 31.

²⁰ See Draft Scoping Plan at pp. 160-161.

New generation resources will certainly be required to serve consumers' needs and to maintain electric system reliability as load increases from electrification and existing generators retire. Large-scale renewable energy generation, offshore wind generation, storage, distributed generation, and distributed energy resources will be needed to satisfy CLCPA mandates and to support electric system reliability. Renewable energy generation must still increase substantially to achieve the CLCPA's 70 percent by 2030 renewable energy requirement and then increase further between 2030 and 2040. As new renewable resources enter service in the nearer term, fossil generation will operate less and less prior to retiring, but remain available for when it is needed to serve load and maintain system reliability. The chart below shows 2021 energy production by fuel source and demonstrates how much output from renewable resources must increase to get to 70 percent renewable energy production by 2030.

Figure 3: Energy Production by Fuel Source (GWh) – Statewide, Upstate, & Downstate New York: 2021



The Draft Scoping Plan also correctly observes that dispatchable and emissions-free resources, with operating characteristics similar to fossil generators, will be equally, if not more important, to protect consumers from electric service interruptions. It states:

The current system is heavily dependent on existing fossil fueled resources to maintain reliability. To ensure reliability and that generation is available when needed, dual fuel capability currently provides oil back up during periods of high gas and electric demand. To replace these units, ***dispatchable and emissions-free resources will be needed to balance the system*** and must be significant in capacity, be able to come on-line quickly, and be flexible enough to meet rapid, steep ramping needs. The importance of developing large amounts of dispatchable generation is echoed in the Power Grid Study, Pathways Study, and NYISO Grid-in Transition and Climate Change Study.²¹

The NYISO supports the State’s consideration of how the wholesale markets can work in conjunction with financial incentives, *e.g.*, Clean Dispatch Credits (“CDC”)²² or a renewable energy credit (“REC”)-like product, to increase the number of new flexible resources interconnecting to the electric grid. Such salable attributes could encourage new technologies that run on storable fuels, as opposed to wind or solar energy.²³ Incentives could also encourage storage resources to possess the capability to charge from the grid, regardless of whether they are coupled with generation or load resources. The option, or technical capability, to charge from the wholesale electric grid improves provision of reliability services by increasing the overall ability of resources to inject or withdraw energy from the grid and lowers overall prices for consumers when the storage resource charges at a lower cost.

The number of new generation resources needed to maintain reliability is informed, in part, by the NYSRC Reliability Rules. The NYSRC conducts an annual probabilistic assessment to determine the Installed Reserve Margin (“IRM”) required to maintain a “1-day-in-10-years” (“1-in-10”) loss of load expectation (“LOLE”).²⁴ The resulting IRM is then converted into an Installed Capacity Requirement that drives the capacity procurement requirements by utilities and other load serving entities (“LSEs”) under the NYISO’s tariffs. The IRM has generally ranged between 15% and 20% in recent years. In addition to the statewide needs, physical transmission constraints restrict the amount of capacity that can be delivered into certain regions of the state. These areas are the Hudson Valley (Zones G-J), New York City (Zone J), and Long Island (Zone K). To maintain resource adequacy in these areas, the NYISO sets minimum amounts of capacity necessary to be procured from supply

²¹ See Draft Scoping Plan at p. 170 (emphasis added).

²² See Draft Scoping Plan at p. 158.

²³ See Draft Scoping Plan at 178. (“should a substitute for natural gas still be needed, advanced green hydrogen and possibly RNG could fill this gap in order to maintain reliability, if scalability, feasibility, and environmental impact and air quality issues can be addressed.”).

²⁴ The NYSRC rules and Northeast Power Coordinating Council (“NPCC”) criteria define resource adequacy such that at any moment in time, the probability of the unplanned disconnection of firm electric load shall not exceed one occurrence in ten years, expressed as one day in ten years, or annually as maintaining a LOLE probability of 0.1.

resources located within those regions. For the 2022-23 capability year that runs from June 1, 2022, to May 30, 2023, these amounts are 89.2% in the Hudson Valley region, 81.2% in New York City, and 99.5% in the Long Island capacity region.

The primary driver of the IRM is expected generation resource performance (*i.e.*, resource availability) during periods when system loads are highest (*e.g.*, on-peak summer hours). As a general rule, the entry of new resources that cannot consistently perform as well as the average performance of the existing generator fleet places upward pressure on the IRM, while new entry of resources that perform above the system average places downward pressure on the IRM. Significant levels of new entry of intermittent renewable resources, *e.g.*, wind and solar, are expected to decrease the average system performance and, therefore, to increase the IRM. In other words, renewable resources **do not** provide a one-for-one replacement for existing fossil generators.

Accordingly, to maintain the same level of reliability during the transition driven by the CLCPA, new, intermittent renewable resources must be complimented by other generation resources that can be dispatched immediately. The NYISO supports the Draft Scoping Plan strategy to encourage NYSERDA to convene stakeholders and conduct strategic research on new renewable and storage project technologies and “should a substitute for natural gas still be needed, advanced green hydrogen and possibly RNG could fill this gap in order to maintain reliability, if scalability, feasibility, and environmental impact and air quality issues can be addressed.”²⁵ The need for these resources can range from momentary to multi-day events. Market and research based initiatives for these technologies must continue because adequate quantities of flexible, long-duration, and controllable zero-emitting resources will be critical to meeting electricity needs and maintaining system reliability.²⁶

3. Storage Provides Value and Must Work in Concert with Generation

The Draft Scoping Plan observes that a portfolio of energy storage technologies will be needed to support balancing the intermittency of energy production as more weather-dependent renewable energy generation connects to the grid. Existing and newer, long-duration, storage will be needed to maintain reliability as the state approaches 2040. This suite of storage technologies, however, will be needed well before 2040 to reach the State’s energy policy goals.²⁷

While storage is a critical part of the future resource fleet, it is only capable of being part of the solution. The electric system will require electricity production to reliably meet demand across a wide range of conditions, every day of the year. Battery storage resources can help to fill in short term reductions in renewable resources output, but extended periods of low- or zero-renewable resource output will rapidly deplete the short duration storage capabilities of existing battery technologies. The resource fleet must include generators that operate on storable fuels in addition to renewable resources and batteries. At times, renewable resource production may be insufficient to serve other load and to provide the charging capability needed for the large levels of storage expected to enter the system.

²⁵ See Draft Scoping plan at p. 178.

²⁶ See *Climate Change Impact and Resilience Study* Official Phase II Report - <https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase-2-Report.pdf/e9214fd4-9c52-036d-b92b-15f282e686e6>.

²⁷ See Draft Scoping Plan at p. 166.

These circumstances could extend the periods when storage resources are unable to supply energy to serve load. A successful transition requires replacing the reliability contributions of the existing fleet of generation as their performance capabilities will be no less essential in a future grid than they are today.

The NYISO seeks the lowest production costs for consumers. To allow the markets to seek the lowest production cost, all technologies that can support the system needs must be able to participate. The NYISO regularly reviews market rules to accommodate participation of new and emerging resources, such as energy storage resources through market participation. When the capabilities of a particular technology require changes to existing market rules, the NYISO has evolved its markets and its Tariffs to accommodate participation along the lines of the Draft Scoping Plan description of expanding wholesale market eligibility participation rules for new policy resources.²⁸ For example, in 2020, the NYISO implemented a participation model for energy storage resources (“ESRs”) and, in 2021, the NYISO expanded the participation model to accommodate co-located resources consisting of a combination of storage and other generating technologies, such as wind or solar.²⁹ The NYISO integrated ESRs as supply resources in both instances, not as providers of transmission service. Although ESRs, like other resources, can be dispatched to prevent an overload of a transmission facility, they do not change the thermal capability of a transmission facility and, therefore, do not change the ratings of transmission facilities. Like other types of suppliers, ESRs can provide dispatchable services to help mitigate transmission constraints and can serve load to meet local reliability needs and defer infrastructure investments.³⁰

4. Interconnection Process Improvements

To support development of new generation resources, the Draft Scoping Plan recommends that the state speed up the pace of processing interconnection applications and emphasize the need for right-sizing human resources at utilities to mitigate delays in application processing. Interconnection rules that support grid reliability, along with siting and other regulatory processes that facilitate timely review and consideration of projects, are necessary to effectively respond to the rapid growth of projects being developed in response to the state’s clean energy policies. The NYISO is committed to continue working with stakeholders to assess how its processes can be enhanced to better manage the increasing volume of resources while still providing the critical reliability analysis needed.

The NYISO’s generation interconnection study process identifies potential adverse reliability impacts associated with new resources interconnecting to FERC jurisdictional distribution and transmission. The process, which requires significant coordination among the NYISO, facility developers, and affected transmission owners, identifies necessary system upgrades and their estimated

²⁸ See Draft Scoping Plan at pp. 171-172.

²⁹ The NYISO believes that, whenever possible, resources should be compensated for the value of the service they provide where and when those services are provided, rather than be supported by contracts providing a fixed rate of return. The NYISO believes, and its Tariffs are currently written to reflect, that ESRs that provide supply or supply-like services should be compensated in the same or a similar manner as other suppliers. The existing treatment of ESRs as supply demonstrates the NYISO’s view that ESRs inject (and reduce withdrawals, in the case of demand response resources) energy as opposed to moving electricity on the transmission system as do transmission facilities.

³⁰ Electric storage resources, like Generators, are included in the NYISO’s reliability planning processes as facilities that can meet reliability needs.

costs to protect electric system reliability. This allows investors to make more informed investment decisions. To facilitate the dramatically increasing number of interconnection requests,³¹ the NYISO has been working with stakeholders to implement improvements to the interconnection study process. NYISO completed a comprehensive redesign of the interconnection study process in 2019. The redesign offers greater flexibility and expedited study options to developers seeking the necessary information to interconnect to the grid. The enhancements have proven effective in accelerating the interconnection study process.

The improvements were applied for the first time to the Class Year 2019, the largest in the NYISO's history, with 66 projects representing 7,254 MW of capacity, and helped the NYISO to bring the Class Year process to closure in record time. Since 2019, the number of new interconnection requests has continued to increase, reaching 197 requests per year and 387 projects with ongoing interconnection studies at the end of 2021.

The NYISO continues to review and improve its interconnection process, including a current initiative under discussion with stakeholders regarding improved coordination between the various interconnection processes. In addition, the NYISO anticipates significant additional interconnection process changes will be required in later 2022 and 2023 prompted by FERC's Notice of Proposed Rulemaking regarding Improvements to Generator Interconnection Procedures and Agreements (Docket No. RM22-14-000). Given the volume of interconnection requests it is imperative to further streamline interconnection processes.

B. Transmission and Distribution Strategies

The Draft Scoping Plan recommends that the state expand electricity transmission and distribution systems to support energy delivery, and, building on the Power Grid Study, continue research, development, and demonstration ("RD&D") and rapid deployment of advanced grid technology. The transmission-focused efforts should strive to alleviate transmission system bottlenecks to allow for better deliverability of renewable energy throughout the state and unbundle constrained resources to allow more hydro and/or wind imports and the ability to reduce system congestion. In addition, the Draft Scoping Plan encourages optimized utilization of existing transmission capacity and rights of way by utilities to accelerate investments in their local systems. These actions will facilitate renewables development and enhance the electrification of transportation and grow safety and resiliency.³²

The NYISO already employs a number of planning processes to identify transmission expansion. These processes are structured to refresh regularly and coordinate extensive consultation with stakeholders, both regional and inter-regional. Considering the interconnected nature of the electric system, the state should continue to utilize these efforts to identify transmission expansion opportunities in New York and consider the impact to the electric system from neighboring states that are also executing their own plans to reduce carbon emissions. Many of these processes, and the associated studies or reports are conducted and refreshed frequently. For example, the System & Resource Outlook ("Outlook"), discussed further below, will be completed later this year, and the

³¹ From 2015 to 2018, the NYISO averaged seven new interconnection requests per month compared to an average of 15 per month from 2019 to present.

³² See Draft Scoping Plan at p. 168.

RNA and CRP reports, discussed throughout these comments, are issued every other year, respectively.

As the grid transforms, more and more of the renewable resources needed to service customers are located far away from load centers. Getting cleaner energy to customers will require more infrastructure. This year, for the first time, the Outlook is examining the total transmission congestion and curtailment of renewable resources and identifying the localities most in need of solutions. The Comprehensive Reliability Plan and Outlook are performed in alternate years, thus, annually supplying a marquis planning study for market participants, utilities, and state policy makers to draw upon in making their plans and determinations.

Building on these reliability and economic planning processes is the Public Policy Process whereby the state Public Service Commission identifies transmission needs driven by federal, state, and local laws and regulations. The NYISO has addressed two public policy needs already: transmission capability expansion in Western New York to access renewable energy from Niagara and Ontario and transmission capability expansion in the Mohawk and Hudson Valleys to bring renewable energy to serve upstate and downstate customers. Currently, the NYISO is addressing a third public policy need to accommodate the injection of at least 3,000 MW of offshore wind generation from Long Island into Southeast New York.

Finally, the NYISO conducts specialized studies, such as the Climate Change Impact and Resilience Study (“Climate Change Study”). Phase 1 of the Climate Change Study³³ analyzed expected increases in customer electricity needs due to climate change, rising temperatures and electrification of transportation, heating, and other end uses. In the Phase II Climate Change Study,³⁴ the NYISO studied and identified gaps in the ability of the existing power system to meet these projected future needs, especially in the absence of traditional dispatchable resources that currently burn fossil fuels. The study determined that dispatchable and emissions-free resources supplying flexible, long-duration, and controllable electric generation must be developed to replace the traditional dispatchable resources that will retire under the CLCPA.

These NYISO studies can and should be used to evaluate and support CLCPA implementation, to review and refine the Draft Scoping Plan recommendations, and to facilitate New York’s orderly transition to a clean energy future. Utilizing the NYISO’s recurring planning studies supports the Draft Scoping Plan recommendations to “continue to evaluate and adjust” and to “ascertain if any program adjustments are needed to ensure continued safe and adequate electric service.”³⁵ The NYISO strongly encourages the state to “adjust policies and procurement targets as necessary in order to achieve the Climate requirements” based on continuous monitoring of system changes and the need to maintain a

³³ New York ISO Climate Change Impact Study, Phase 1: Long-Term Load Impact - <https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase1-Report.pdf/4311bdd4-a389-afbe-9ee9-b6bf523b0a36>.

³⁴ *Climate Change Impact and Resilience Study* Official Phase II Report - <https://www.nyiso.com/documents/20142/16884550/NYISO-Climate-Impact-Study-Phase-2-Report.pdf/e9214fd4-9c52-036d-b92b-15f282e686e6>.

³⁵ See Draft Scoping Plan at pp. 159 and 171.

reliable electric grid as reflected in the NYISO studies and reports conducted every year.³⁶ This approach would also support the Draft Scoping Plan recommendation for the state to conduct established biennial evaluations in consultation with the NYISO.³⁷

1. NYISO's Public Policy Planning Process

The NYISO's Public Policy Transmission Planning Process is well positioned to support the State's effort to expand electricity transmission. This process allows interested entities to propose, and the NYPSC to identify, transmission needs driven by Public Policy Requirements. A Public Policy Requirement is a federal or state law or regulation, including a NYPSC rulemaking order, which drives the need for additional transmission capability in the state. In response to a declared public policy need, the NYISO requests that interested entities submit proposed solutions and evaluates the viability and sufficiency of those proposed solutions to satisfy each identified need. The NYISO then ranks the solutions and may select the more efficient or cost-effective transmission solution to each identified need. The NYISO encourages the state to rely on the Public Policy Transmission Planning Process in support of the Draft Scoping Plan recommendation, and related final recommendations, to expand transmission in New York.

Clean energy policies are driving the need for investment in the transmission system to ensure that clean energy supplies are deliverable to consumers. Specific transmission infrastructure investments to meet these needs depend, in part, on the evolution of the resource mix and the geographic distribution of new renewable generation. The NYISO views additional transmission capability as necessary to alleviate constraints across the system and maximize the potential of renewable resources to meet electric demand.

Most of New York's renewable energy capability is located offshore, and upstate in northern and western New York. To bring renewable energy to market, new transmission projects were identified by the NYPSC through the NYISO's Public Policy Transmission Planning Process. Three projects, currently under construction, represent the largest investment in transmission infrastructure in New York State in more than 30 years.

In addition, the NYISO is currently evaluating transmission projects proposed in response to the Long Island Offshore Wind Export Public Policy Transmission Need determined by the New York State Public Service Commission. Optimizing the potential of the offshore grid and the interconnection into Long Island and New York City will be essential to supporting the capability of

³⁶ See Draft Scoping Plan at p. 159 ("Evaluate and adjust: The State should continue to evaluate and adjust policies and procurement targets as necessary in order to achieve the Climate Act requirements and goals and deploy renewable energy systems including solar, land-based wind, and offshore wind").

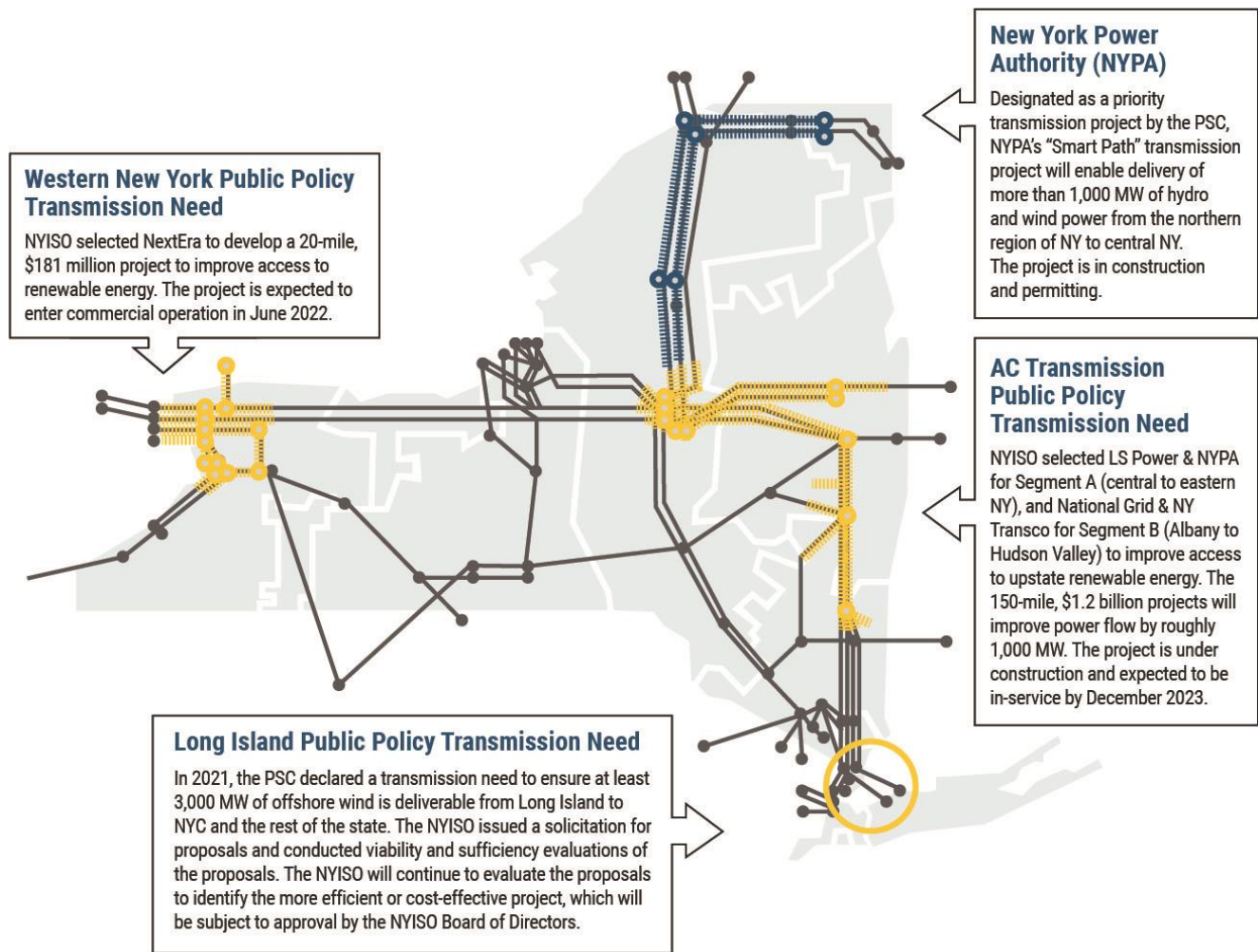
³⁷ See Draft Scoping Plan at p. 171 ("Continual Evaluation: The State should conduct established biennial evaluations to assess the state of bulk power system reliability in consultation with the federally designated electric bulk system operator (NYISO) and the State and federally jurisdictional entity the New York State Reliability Council. These evaluations should ascertain if any program adjustments are needed to ensure continued safe and adequate electric service. They should be informed by the review of the State's power system performance in conformance with established operations requirements and by relevant studies including the NYISO's Reliability Needs Assessment").

the offshore wind generation buildout. Offshore wind generation is integral to the clean energy policy the CLCPA mandates as the state expects to these resources to eventually reach a scale of 20 GW.³⁸

The Public Service Commission has also fostered necessary transmission infrastructure through: (1) review of local transmission needed for the CLCPA through the State Power Grid Study and local transmission projects proposed by the New York Transmission Owners, (2) new transmission into New York City with the Tier 4 REC approvals including the Clean Path New York Project and the Champlain-Hudson Power Express, and (3) approval of NYPA's request to proceed with development of its proposed "Smart Path Connect" projects in northern New York.

³⁸ See Draft Scoping Plan at pp. 74 and 169 ("The State should conduct further planning and pursue system upgrades on Long Island and in New York City to facilitate 9,000 MW of offshore wind.").

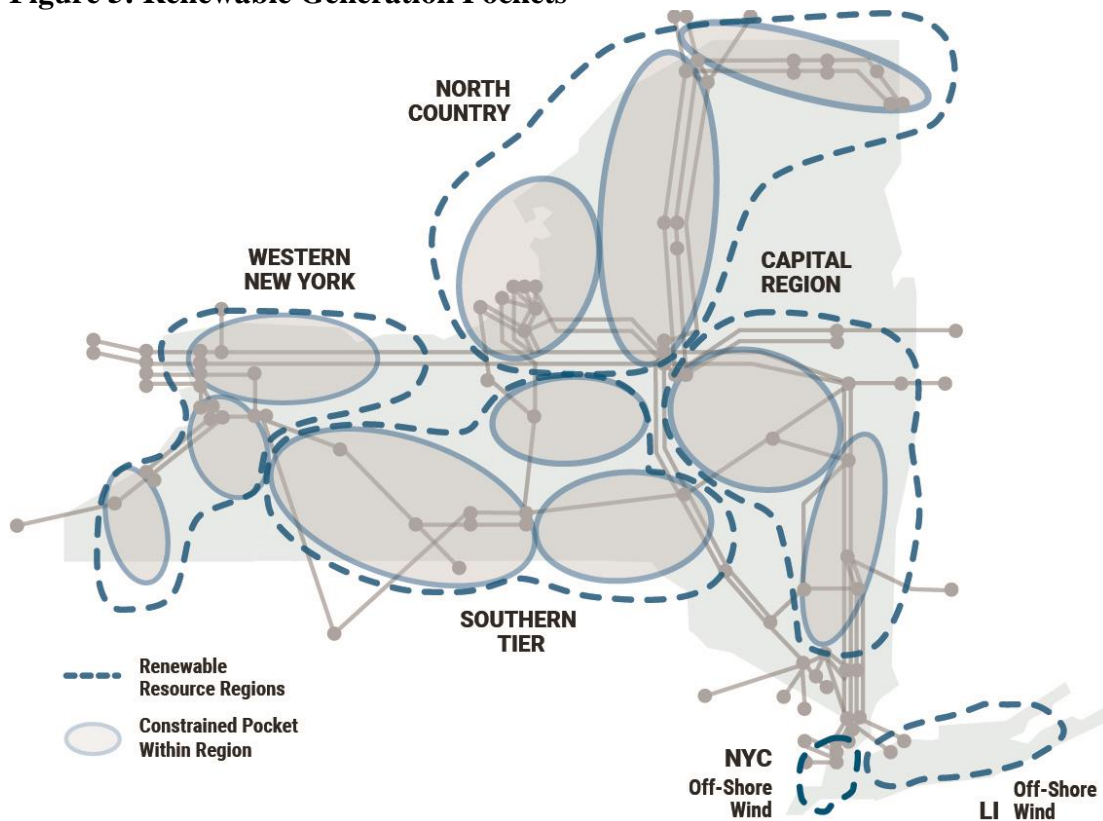
Figure 4: New Transmission Projects in New York State



2. NYISO's Economic Planning Process

The NYISO's 2019 Economic Planning Process conducted an analysis of New York's electric system to identify transmission constraints that may prevent the delivery of renewable energy to achieve the CLCPA's 70% renewable energy mandate for 2030. The analysis modeled a set of demand and generation assumptions, including 15,000 MW of utility-scale solar, 7,500 MW of behind-the-meter solar, 8,700 MW of land-based wind, and 6,000 MW of offshore wind capacity. This detailed study was designed to help policymakers and developers to identify opportunities for transmission expansion to facilitate achievement of the state's climate policy goals.

Figure 5: Renewable Generation Pockets



The 70% by 2030 analysis identified transmission-constrained “renewable generation pockets,” as well as the levels of renewable generation curtailments that would occur within each pocket. “Curtailments” occur when renewable generation exceeds the transmission limits, requiring suppliers to reduce their output to avoid overloading transmission facilities. The generation “pockets” revealed by the study represent regions in the state where renewable generation resources cannot be delivered fully to consumers statewide. The study³⁹ projected that transmission constraints in these pockets will likely result in curtailment of 11% of the total potential renewable energy production across New York, with curtailment levels in some individual pockets as high as 63%. The findings underscored an important point: additional transmission investment is necessary throughout New York to achieve the objectives of the CLCPA. The System & Resource Outlook, to be completed in 2022, will provide an updated assessment of transmission opportunities across the state. The analysis includes a policy case that will further inform the resource and transmission needs related to the CLCPA. The NYISO encourages the State to refer to the System & Resource Outlook to inform the transmission expansion strategy described the Draft Scoping Plan recommendation, and any related final recommendations.⁴⁰

³⁹ The NYISO is currently updating the study to provide an assessment of transmission opportunities.

⁴⁰ See Draft Scoping Plan at p. 169 (“The State should expand electricity transmission and distribution systems to support energy delivery”).

C. Draft Scoping Plan Strategies to Improve Reliability Planning and Markets

1. NYISO's Reliability Planning Process

NYISO reliability planning processes evaluate reliability needs that are arising due to a shifting resource mix, as higher-emitting, controllable fossil generators deactivate and new renewable, intermittent generation, and other clean energy supply resources enter service. The NYISO's reliability processes form a baseline system that identifies transmission and resources expected to enter into service, and transmission that is needed to maintain reliability. Additional transmission infrastructure needed for public policy requirements, like the CLCPA, build on these reliability analyses and solutions.

The Draft Scoping Plan recommends that the State conduct established biennial evaluations to assess the state of bulk power system reliability in consultation with the NYISO and the New York State Reliability Council. The NYISO supports this recommendation and agrees that ongoing evaluations and transmission system reliability planning are critical to maintaining an energy secure and sustainable system for New York. The NYISO has established processes that should be used to support the Draft Scoping Plan recommendation. The NYISO's reliability planning processes identify reliability risks and, if found, include actions such as solicitations of transmission and resource solutions needed to maintain reliable electric service. These processes are designed to provide the baseline reliable system on which to build the grid of the future, integrating renewable resources and storage to attain the requirements of state climate change laws. The frequency and structure of these planning studies allow the NYISO and stakeholders to regularly review study assumptions and scenarios based on up-to-date operational experience. Review of the State's power system performance in conformance with established operations requirements will be critically important throughout the clean energy transition.

Every two years, the NYISO conducts a Reliability Planning Process that examines the reliability of the State's bulk power system over a ten-year planning horizon.⁴¹ The NYISO applies mandatory and enforceable reliability rules, established by international, national, regional, and New York State-specific reliability standards organizations, to examine two key aspects of reliability:

1. **Resource Adequacy:** Analysis of whether the bulk power system has enough resources to reliably serve the forecasted demand if some resources or facilities are unavailable, and
2. **Transmission Security:** Evaluation of the bulk power system's ability to operate reliably over a broad spectrum of system conditions and following a wide range of probable system events.

The NYISO's planning processes strive to produce market-based solutions to identified needs whenever possible. This approach allows developers and investors to respond to the needs and price signals in the NYISO's markets and to assume the risks of such investments, which avoids imposing those risks on rate-paying consumers. The NYISO also identifies the Responsible Transmission Owners for each Reliability Need and requests that those Transmission Owners submit regulated

⁴¹ The Reliability Planning Process consists of two studies; (1) the Reliability Needs Assessment ("RNA"), and (2) the Comprehensive Reliability Plan ("CRP").

backstop solutions in the event they are needed to maintain bulk power system reliability. Other interested entities may also submit alternative regulated solutions to address the identified Reliability Needs.

Key to this process as it relates to the CLCPA and the Draft Scoping Plan, the NYISO's long-term planning process evaluates resource changes; the impact of new or existing regulations on resource availability, removes all generators that have indicated their intent to deactivate, and incorporates new resources that have achieved defined milestones. This approach paints an accurate picture of available resources on the ten-year horizon and allows long-term, market-based and regulated solutions of all types, including generation, transmission, and demand-side measures to be timely permitted, constructed and entered into service. At this time, the NYISO expects its current processes to address reliability needs through market-based and regulated solutions while supporting achievement of the CLCPA mandates.

The Draft Scoping Plan also recognizes that power system studies and planning should consider analyses to integrate climate change impacts as needed for reliability and resiliency and that risks and reliability challenges will change over time.⁴² The NYISO is committed to working with the NYSRC, state agencies and all stakeholders and interested parties to study, understand, and meet emerging risks and reliability challenges.

2. Resource Adequacy

The Draft Scoping Plan recommends that the State and the NYISO examine all resource adequacy options and continue to improve compensation for resource adequacy contributions. It specifically calls for the state to continue working with the NYISO "on market enhancements that facilitate the resource transition, support investment, minimize costs to consumers, eliminate buyer-side mitigation (BSM) for Climate Act resources, and meet reliability."⁴³ The NYISO is continuously evaluating the accuracy and robustness of its underlying resource adequacy models, reliability metrics and probabilistic tools, and updating them to incorporate changing characteristics of the power system and resource fleet. The NYISO welcomes the opportunity to continue working on these efforts with the state and to build on the recent success of the comprehensive mitigation reform effort.

The combination of solar, wind, and today's battery storage technologies are not sufficient on their own to provide the services necessary to support reliability on the power grid. The resource adequacy challenge becomes attracting and retaining sufficient resources, including flexible resources, to maintain reliable service. The NYISO-administered energy and ancillary service markets alone do not provide enough revenue to attract sufficient investment to maintain adequate resources for system reliability. Thus, capacity markets provide and will need to continue to provide an additional revenue stream to support adequate investment to maintain the required levels of resource adequacy. As the fleet transforms and new challenges emerge, ongoing efforts will be needed to ensure that together the energy, ancillary service, and capacity market designs continue to support adequate investment.

While the capacity market exists to help ensure reliability, it must also consider the expected impacts of public policies on resource availability. To ensure that rules intended to preserve

⁴² See Draft Scoping Plan at p. 171.

⁴³ See Draft Scoping Plan at p. 167.

competition in the capacity market do not interfere with the state’s clean-energy policies, the NYISO undertook a significant effort with stakeholders and policymakers to revise its buyer-side capacity market mitigation (“BSM”) measures.⁴⁴ If the BSM rules did not evolve, they were likely to interfere with CLCPA policies by improperly mitigating new entrants necessary to achieve New York State’s policy objectives. The NYISO’s approach encourages efficient investments to attract and retain the necessary resources to maintain resource adequacy and move towards the CLCPA objectives.

After extensive engagement with stakeholders in the NYISO’s shared governance process, in January 2022 the NYISO filed with FERC a set of market reforms with an ambitious goal to resolve the long-standing tensions between federal market oversight and state clean-energy public policies. The comprehensive mitigation reform (“CMR”) proposal offered a durable resolution between FERC’s obligation to protect the NYISO-administered capacity market from buyer-side capacity market power and New York State’s authority to address New York’s resource mix. The proposal was the product of an extensive shared governance process that resulted in approval by more than 80% of NYISO stakeholders. The CMR proposal was approved with strong backing across all five stakeholder sectors, including unanimous support from New York State entities, New York City, municipal interests and the New York Transmission Owners, and significant support from both existing capacity suppliers and consumer interests.

The CMR proposal sought to:

1. Remove certain resources from being reviewed under the NYISO’s buyer-side capacity market mitigation rules if they serve the goals of the CLCPA; and
2. Adopt a marginal capacity accreditation market design to improve the accuracy of the capacity values assigned all capacity supply resources from a resource adequacy perspective.

On May 10, 2022, FERC accepted the NYISO’s proposal, subject to certain compliance requirements. The FERC’s approval represents a landmark regulatory change to harmonize the NYISO’s wholesale electricity markets with the state clean resource requirements in the CLCPA.⁴⁵

3. Markets are Critical to Achieving the CLCPA

The NYISO supports reliability primarily through three complementary markets: energy, ancillary services, and capacity. Wholesale electricity markets have successfully delivered efficiency gains on the grid and cleaner energy production, making them an effective platform for reflecting public policy and technological influences efficiently and reliably. In these markets, energy, regulation, and operating reserves are simultaneously procured to meet demand while respecting transmission limits. The NYISO has a proven record of enabling the entry of new technologies into the state’s competitive wholesale electricity markets consistent with state public policy objectives. The NYISO-administered wholesale energy markets are critical to successfully fulfilling the mission and goals of reliability and economic efficiency while also shifting investment risk from ratepayers to asset

⁴⁴ See Draft Scoping Plan at pp. 167 and 172. The NYISO’s recent BSM revisions are consistent with the approach discussion in the Draft Scoping Plan.

⁴⁵ The NYISO is engaging stakeholders to address implementation details associated with the landmark proposal.

owners and serving as an effective platform for achieving New York State environmental objectives. As such, the NYISO is actively engaging stakeholders and policymakers in developing plans to meet the future challenges expected to arise from a grid characterized with high levels of energy supply from intermittent renewable and Distributed Energy Resources (“DER”).⁴⁶

The NYISO is a market design leader — developing and administering the wholesale market enhancements to meet clean energy challenges reliably and to position the NYISO as a leader in competitive wholesale electric markets. Through engagement with stakeholders and regulators, the NYISO is supporting a more dynamic power grid with new market rules for energy storage integration, participation in our wholesale electricity markets by distributed energy resources, and new ancillary services products. Market rules that encourage investment in resources that can respond rapidly to changing conditions will be essential for maintaining reliability of the grid of the future. For example, the NYISO expects that it will be necessary to dynamically determine reserve requirements and implement changes to real-time capabilities to better manage limited energy/duration resources.⁴⁷

The Draft Scoping Plan recommends that the state should update the market products, requirements, and technology standards needed to maintain reliability over time so that all resources can participate in the market, based on their attributes, to provide the products and services needed for reliability.⁴⁸ Reliability needs and risks will change over time and the markets should reflect these changes as well. The Draft Scoping Plan goes on to suggest that the state should continue assessing opportunities to improve accuracy and granularity of wholesale market energy price signals, including shortage pricing, congestion relief, and peak/off-peak pricing.

The State should adapt current ancillary service market designs and look to add products that are needed to incent flexibility as needed to efficiently integrate renewables. The NYISO agrees that the wholesale markets must continue to adapt and will strive to continuously improve the markets to meet the needs of all New Yorkers. The NYISO is fully committed and actively working with stakeholders to evolve the wholesale electricity markets on a continuous basis.

The NYISO encourages the state to work with the NYISO and its stakeholders to continue improving wholesale electricity markets. The NYISO has extensive experience developing and improving its market products and is already working on changes consistent with the CLCPA and the Draft Scoping Plan. The markets administered by the NYISO are designed through an extensive open and transparent shared governance process that includes participation by utilities, suppliers, consumer interests, environmental advocates, environmental justice interests, New York State entities, and municipalities.

The NYISO’s approach to addressing these challenges is based upon two guiding principles: (1) all aspects of grid reliability must be maintained; and (2) competitive markets continue to maximize economic efficiency and minimize the cost of maintaining reliability. The NYISO is

⁴⁶ DER is a broad category of resources that includes distributed generation, energy storage technologies, combined heat, and power systems, and microgrids. A DER is generally customer-sited to serve the customer’s power needs, but may, in some instances, sell excess energy production or ancillary services to the power system.

⁴⁷ See NYISO’s Dynamic Reserves presentation to stakeholders, June 16, 2022, available at <https://www.nyiso.com/documents/20142/31532822/6%20Dynamic%20Reserves.pdf/ca9ad944-c911-1874-2710-9ba04521d789>.

⁴⁸ See Draft Scoping Plan at pp. 171-173.

dedicated to the task of anticipating the needs for existing and new grid reliability services and constantly evolving its wholesale market design to accomplish those needs. Wholesale markets must continue to reflect all grid reliability services needed through defined products, *e.g.*, operating reserves, with product pricing that reflects the marginal cost consistent with the reliability need when supply is scarce.

As the level of renewable resource generation increases, the grid will need sufficient flexible resources to balance variations in wind and solar output. The integration of battery storage will help store renewable energy for later use on the grid and is poised to help with the short duration and daily cycles of reduced renewable output. Depending on the duration of system need, enhancements to various market design aspects may be required including reserves, regulation, ramping, and load forecasting. Looking ahead to 2040, the policy for an emissions-free electricity supply will require the development of new technologies. Long-duration, dispatchable, and emission-free resources will be necessary to maintain reliability and meet the objectives of the CLCPA. Resources with this combination of attributes are not commercially available at this time but will be critical to future grid reliability. The NYISO is exploring several wholesale electricity market enhancements focused on improving price signals to drive investment in resources with the characteristics and attributes needed for continued grid reliability.

As part of its multi-year Grid in Transition initiative, the NYISO is continuing to work with its stakeholders to define the operational risks and flexibility needs in a future of greater reliance on intermittent resources, higher load forecast uncertainty, and impacts of climate change. The NYISO is actively working with stakeholders to develop changes to existing ancillary service products and consider new ancillary service products to incent the entry or continued operation of flexible resources, thereby balancing the intermittency of new renewable resources. The NYISO believes that new or modified ancillary service products will be required and that response times from resources will need to be faster. Reliable operation of the power system will become more complex under these expected conditions, and the probability of reliability risks will grow due to uncertainties in demand, supply, and available infrastructure. The NYISO believes these risks can generally be described as risks to energy security. That is, if unaddressed, these changes put at risk the availability of sufficient energy when and where needed for all New Yorkers to continue to enjoy safe and reliable electric service.

The NYISO is accelerating development of participation models for hybrid resources, internal HVDC transmission lines, and implementing DER participation rules in 2022. These participation models are designed to maximize the ability of the participating resources to provide reliability services in our markets consistent with the reliability standards set by NERC, NPCC, and NYSRC, and regulatory requirements established by FERC.

Existing ancillary services products continue to provide value and support management of system reliability. However, changes in the resource mix are leading to operational challenges including:

- Larger risks related to loss of supply events in parts of New York;
- More variability in net load due to the growth of behind-the-meter resources; and
- Increased risk for and probability of correlated reductions in energy output from renewable resources that are clustered, such as wind and solar resources.

These and other operational challenges related to simultaneously balancing consumer demand and supply are expected to increase over time. Engaging increased participation by consumers will also become increasingly important as deployments of wind and solar resources rise to support New York's decarbonization goals.

Consistent with the Draft Scoping Plan's discussion of wholesale market improvements, including support for flexible resources and demand-side solutions,⁴⁹ the NYISO supports recommendations to consider changes to expand flexible, distributed resource participation and demand-side opportunities, including the potential to set prices in the real-time energy market and to have a greater role in providing reserves and regulation in short-term operations.

D. Value Environmental Attributes

The Draft Scoping Plan encourages the State Energy Planning Board to investigate and implement options to develop market mechanisms to assist in the removal of fossil generators from the system. The options to be considered include, but are not limited to, the opportunity for carbon pricing and valuing of environmental attributes either within or external to NYISO markets. The Draft Scoping Plan goes on to recommend that the strategy determine the most effective approach to incorporate environmental values in market pricing and/or in policy and investment benefit-cost analysis.⁵⁰ While not entirely within the NYISO's responsibilities, the NYISO encourages the Climate Action Council to develop an economy-wide market for targeted environmental attributes or quantified pollution reductions.

An economy-wide environmental attribute market would be the most efficient way to achieve the numerous goals of the CLCPA and to implement the Draft Scoping Plan recommendations, several of which are outside the electricity sector. Markets will help encourage investment, decrease costs, and achieve the state's environmental mandates. Economy-wide markets for attributes would require stakeholders and industry participants to address the tradeoffs across the broad cross-sector objectives of the CLCPA.

If the Climate Action Council wishes to pursue an electricity-sector specific approach,⁵¹ the NYISO's carbon pricing proposal is fully developed and has already been thoroughly vetted by stakeholders. Carbon pricing in NYISO's wholesale markets has the strong advantage of providing technology-neutral signals regarding where new resources should locate for the highest value to the system and its consumers. Internalizing a state-determined, meaningful social cost of carbon dioxide emissions in the NYISO's energy market would send a financial incentive to all developers and electricity suppliers to identify efficient ways to address carbon-reduction requirements for downstate loads.⁵²

⁴⁹ See Draft Scoping Plan at pp. 173-175.

⁵⁰ See Draft Scoping Plan at p. 172.

⁵¹ See Draft Scoping Plan at p. 173 ("Consider if (electric only) carbon pricing in the wholesale markets will help achieve the Climate Act mandates, including a more rapid increase in renewable and storage build out and a transition of the fossil fleet").

⁵² See Analysis Group, Clean Energy in New York State: The Role and Economic Impacts of a Carbon Price in NYISO's Wholesale Electricity Markets at 37, <https://www.nyiso.com/documents/20142/2244202/Analysis-Group-NYISO-Carbon-Pricing-Report.pdf/81ba0cb4-fb8e-ec86-9590-cd8894815231?t=1570098837163>.

The Carbon Pricing Proposal incorporates the cost of carbon dioxide emissions into the NYISO-administered wholesale energy markets using a state-determined social cost of carbon dioxide emissions price in dollars per ton. Under this approach, the NYISO would expect the State to develop a social cost of carbon dioxide emissions consistent with the CLCPA mandates. Suppliers⁵³ would then embed carbon charges in their energy offers (*i.e.*, a supplier's carbon dioxide emissions adder in \$/MWh) and the NYISO's existing processes would incorporate the carbon price into the power system commitment, dispatch, and price formation. As a result, the market-clearing price of energy would increase whenever carbon dioxide-emitting resources are on the margin, which is referred to as the carbon effect on Locational Based Marginal Prices or LBMPs. All Suppliers, including clean energy resources such as offshore wind resources, would receive the higher energy price, net of any carbon dioxide charges due on their emissions, if applicable. Lower and non-emitting resources would benefit from higher net revenues, and the wholesale energy market would harness the power of competition to further encourage the investment and innovation needed to meet CLCPA mandates. Importantly, the Carbon Pricing Proposal supports the overall transition to a cleaner resource base by providing a comparative disadvantage to carbon emitting resources, through lower net revenues.

Efficient wholesale electricity markets depend on competition and transparent price signals that accurately reflect system needs. The price signals in the NYISO markets provide the foundation for economically efficient generation, transmission, demand response, and energy efficiency investment decisions. Supply resources rely on prices to determine whether to offer into the NYISO's markets and operate. Investors and developers rely on transparent market signals to determine whether to build new facilities, what type of facility to build, and where to build. Wholesale market prices must accurately reflect system needs and resource costs in order to produce the most efficient investment and operational decisions, and ultimately the lowest costs for consumers. The NYISO believes that reflecting a meaningful social cost of carbon dioxide emissions, set through a state or regional initiative, would maintain the benefits of wholesale electricity market competition and achieving the CLCPA. Carbon pricing utilizes these benefits to best serve electricity consumers and works in parallel with state/regional programs to reduce carbon dioxide emissions and facilitate renewable resource development.

E. Electric Market and Emissions Data Availability

The Draft Scoping Plan recommends that DPS, NYSERDA, and the NYISO identify and make available key pieces of data needed for markets to facilitate the clean energy transition. The recommendation contemplates provision, as needed, of real-time marginal emissions data, average emissions data, and/or zonal resource/fuel mix data, from the NYISO, as defined by New York City and pertinent State agencies. New York City and pertinent State agencies would have to make a number of assumptions, including imports and exports from other regional transmission organizations and independent system operators, to identify the characteristics of a valuable dataset. The goals of the dataset, as described in the Draft Scoping Plan, are for New York City and pertinent State agencies to

⁵³ See NYISO, *Open Access Transmission Tariff*, Section 1.19 (“Supplier: A Party that is supplying the Capacity, Energy and/or associated Ancillary Services to be made available under the ISO OATT or the ISO Services Tariff, including Generators, BTM:NG Resources, and Demand Side Resources that satisfy all applicable ISO requirements”).

facilitate cost-effective implementation of the Climate Act, Local Law 97, and to improve value of DER and demand response programs.⁵⁴

A pillar of the NYISO's focus is to serve as an independent source of fact-based information on the evolving electric system. As the state works to achieve the renewable and decarbonization mandates under the CLCPA, the need for factual information from an independent source has never been more important. One of NYISO's primary objectives is to be recognized as an authoritative source of information on New York's dynamic electric system. The NYISO produces a series of documents and posts voluminous amounts of data on its website to meet this objective and to inform investors, policymakers, lawmakers, market participants, industry stakeholders, and the public.⁵⁵ These documents include the NYISO's annual flagship publication, Power Trends, the Load & Capacity Data Report (or Gold Book), the System & Resource Outlook, the RNA and CRP Reports, as well as real-time and nearer-term electric system data. NYISO will continue these efforts and will evaluate new strategies to disseminate critical electric system data. NYISO will continue to work with State agencies and stakeholders⁵⁶ on the data necessary to support the grid of the future.

F. Community Choice Aggregation

The Draft Scoping Plan recommends that NYSERDA “continue to encourage development of [Community Choice Aggregation] CCA programs where communities choose 100% renewable energy as the default supply, and where participants are automatically enrolled in Community Solar.”⁵⁷

The adoption of large scale CCAs would require revisiting the IRM calculation methodology that the NYISO and the NYSRC use to protect electric system reliability. Large-scale CCAs must be accounted for appropriately as resources or as loads in the load and resource models used to calculate the IRM and resource adequacy in reliability assessments. If the NYISO, and the NYSRC, are aware of, and can plan for, the CCA program loads, the NYISO-administered markets can supply loads with the necessary electricity when the CCA renewable energy or Community Solar is not available. Accordingly, CCA programs must be designed such that resource adequacy planning and annual IRM processes fully account for serving CCA loads.

IV. Conclusion

The Draft Scoping Plan accurately describes how achieving a 100% emissions-free power grid will require phasing out the use of fossil fuel for power generation over time and correctly acknowledges that New York will also need to maintain a completely safe and reliable power grid throughout this transition. New York must have a detailed process in place to maintain electric system

⁵⁴ See Draft Scoping Plan at p. 175.

⁵⁵ The NYISO's provision of relevant, factual data and reports are designed to benefit Market Participants and other users. The NYISO does not provide data to support specific third-party efforts, such as review of compliance with and/or enforcement of local laws.

⁵⁶ A project is currently under discussion in the NYISO's stakeholder process to consider improvements to the NYISO's real-time fuel mix/renewable generation posting. Con Edison's Emissions Rate Transparency Project <https://www.nyiso.com/documents/20142/29526774/Emissions%20Transparency%20Project%20Presentation.pdf/e2a93952-1998-07c7-5bbf-90c00bb429f1>

⁵⁷ See Draft Scoping Plan at p. 165.

reliability as new generators connect to the electric grid and the emitting generators gradually retire. The path forward will take a collaborative effort, and the NYISO looks forward to working with its stakeholders, state agencies, and the Climate Action Council to address the priorities and goals set forth under the CLCPA.

The NYISO appreciates the Council's efforts to develop the Draft Scoping Plan. The NYISO encourages the Council to consider these comments as it develops the final scoping plan and looks forward to working with the Council and the state agencies to support implementation of the CLCPA, while maintaining electric system reliability for all New Yorkers.

Respectfully submitted,

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