White Paper on Clean Energy Standard Procurements to Implement New York's Climate Leadership and Community Protection Act

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CASE 15-E-0302

JUNE 18, 2020

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I. INTRODUCTION

On July 18, 2019, Governor Cuomo signed the Climate Leadership and Community Protection Act (CLCPA), which went into effect January 1, 2020, and represents the most ambitious and comprehensive climate and clean energy law in the Nation. The economy-wide decarbonization called for by Governor Cuomo – and codified in the CLCPA – requires that New York harness a power generation sector that no longer emits greenhouse gases and provides electricity for a greater proportion of the overall economy. Both strategies, decarbonization of the generation sector and electrification of other sectors – all while ensuring efficiency and cost-effectiveness – must be carried out simultaneously and vigorously. To advance the first strategy, the CLCPA requires the establishment of a renewable energy program, as now codified in the Public Service Law (PSL). In particular, Section 66-p of the PSL directs the New York State Public Service Commission (Commission) to "establish a program" whereby: (1) jurisdictional load serving entities (LSEs) have secured adequate amounts of renewable energy resources to serve at least 70% of load in 2030 (referred to as the "2030 Target" or "70 by 30 Target"), and (2) there are zero emissions in 2040 associated with electrical demand (referred to as the "2040 Zero Emission Target").[1] Beneath the sector-level goal, the CLCPA directs the establishment of programs for the procurement of specific technologies, including the deployment of 6 GW of photovoltaic solar generation by 2025, 3 GW of energy storage resources by 2030, and at least 9 GW of offshore wind by 2035.[2]

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1 PSL §66-p(2).

2 PSL §66-p(5).

The New York State Energy Research and Development Authority (NYSERDA) and the staff of the New York State Department of Public Service (DPS or Staff) developed this White Paper to identify a proposed regulatory structure to address the CLCPA requirements for a renewable energy program. This White Paper is being presented for public notice and comment, as well as the Commission's consideration. In sum, the White Paper proposes to: (1) use the existing regulatory and procurement structure established under the Commission's Clean Energy Standard (CES) to meet the 70 by 30 Target and set the state on a rapid and irreversible path to achieve the 2040 Zero Emission Target, and (2) adopt policy changes and other modifications to the CES in order to align with the CLCPA and meet this Target.[3] Specifically, this White Paper:

- Addresses key provisions in the CLCPA relating to the 70 by 30 Target, including the role of jurisdictional LSEs and the definition of "renewable energy systems";
- Projects the quantity of renewable energy that must be deployed to achieve the 70 by 30 Target;
- Identifies average annual procurement targets for the Tier 1 program adopted under the CES (Tier 1) and recommends changes to the Tier 1 procurement process;

[3] The Commission adopted the Clean Energy Standard in furtherance of the 2015 State Energy Plan, which set a target that 50 percent of electricity used in New York by 2030 be generated from renewable sources. See, Case 15-E-0302, et al., Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, Order Adopting a Clean Energy Standard (issued August 1, 2016)("2016 CES Order").

- Proposes a procurement trajectory for offshore wind renewable energy credits (ORECs) intended to meet the 9 GW by 2035 requirement;
- Proposes the creation of Tier 4 of the CES for the procurement of environmental attributes associated with renewable energy deliveries into New York City (Zone J);
- Proposes a methodology for extending Tier 1 eligibility to renewable energy facilities that undergo repowering; and
- Addresses the actions already taken, and those that will be taken, to ensure that disadvantaged communities realize the benefits which result from achieving the 70 by 30 Target.

The policies and procurement targets proposed in this White Paper implement the requirements of the CLCPA, including the 70 by 30 Target. Achieving the 70 by 30 Target is a necessary and foundational precondition for achieving the 2040 Zero Emission Target. The investment and procurement commitments for 70 by 30 are needed now in order drive the availability of the quality and quantity of renewable resources required. These polices and procurement targets will be updated and adjusted over the course of the next decade. The CLCPA requires the Commission to undertake a biennial review of the program adopted to meet both the 2030 and 2040 Targets,[4] so that the Commission can adjust Program requirements as necessary. This White Paper anticipates that, in making such adjustments, the Commission will be in position to benefit from technology

and market developments and from information about such developments.

With respect to generation, New York State should actively pursue programs and policies that accelerate the development and adoption of advanced technologies that improve the functionality and economics of clean resources, including novel flexibility resources and new zero-emission solutions that may take advantage of the repurposing of existing facilities. With respect to load, the implications of the increasing energy efficiency in, and electrification of, buildings, transportation, and certain industrial processes will also be clarified over time. Moreover, the regulatory landscape is likely to evolve. Potential future regulations may be promulgated by federal and state energy and environmental regulators – especially as regards any electricity or emissions limitations, respectively and the wholesale electricity markets similarly may evolve to reflect regulatory developments and objectives. This White Paper acknowledges the need to track such developments so as to best update the procurement and related goals to achieve the 2030 and 2040 Targets.

Finally, this White Paper recognizes that achieving the 2030 and 2040 Targets relies on the foundational contribution of existing renewable resources already in place, including the State's hydroelectric facilities. The ability of these resources to make this contribution relies on their continued financial viability and competitiveness in the energy markets administered by New York Independent System Operator, Inc. (NYISO). In certain cases, the Commission has already acted to establish programs that provide economic support to classes of existing resources whose financial viability is at risk, such as the CES Maintenance Tier (Tier 2), which is designed to ensure financial viability for small hydroelectric, wind and biomass

resources with demonstrated need; and CES Tier 3, which is designed to preserve the nuclear unit's environmental attributes through the purchase of Zero Emission Credits (ZECs) from qualifying nuclear facilities.

On January 24, 2020, recognizing the contributions and ongoing issues with the financial viability of the existing renewable baseline delivering to New York, NYSERDA filed a petition (Tier 2 Petition)[5] proposing a Competitive Tier 2 Program for baseline renewable generation. In the Tier 2 Petition, which is discussed further in Section II.C.4, NYSERDA proposed to advance a three-year Competitive Tier 2 program to support certain wind and hydropower facilities through standard 3-year contracts. Competitive Tier 2-eligible facilities would be existing non-state-owned run-of-river hydropower and existing wind generators located within the State.

In its comments on the Competitive Tier 2 Program, the New York Power Authority (NYPA) noted the significant amount of baseline renewable resources that the State relies on for its energy and climate goals from NYPA's fleet of hydroelectric generators, which account for approximately 55% of the baseline amount of renewable generation resources. The ability of NYPA hydroelectric resources to contribute their full baseline output to the achievement of State energy and climate objectives, and to CLCPA goals, depends in part upon each resource's continued financial viability. It is proper to consider the process by which the treatment of NYPA's hydroelectric resources will be

[5] Case 15-E-0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, Petition Regarding Clean Energy Standard, Competitive Tier 2 Program for Baseline Renewable Generation (filed January 24, 2020).

evaluated in the future given the extent to which they contribute to New York's baseline of renewable generation.[6]

Of near-term relevance, given the existing policy proposal before the Commission for a Competitive Tier 2 program, as discussed further in Section II.c.4, this White Paper invites comments on whether, and the extent to which, the attributes associated with baseline generation from NYPA's hydroelectric resources should be used by NYPA as a self-supply option under the proposed Competitive Tier 2 program.

Given the comprehensive nature of the changes needed to update the CES to ensure consistency with the CLCPA, NYSERDA and Staff recommend that the Commission issue one comprehensive order that addresses all renewable energy tiers, including the new Competitive Tier 2 proposed by NYSERDA to address the environmental attributes of existing renewable energy resources, discussed further below.

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6 If a NYPA hydroelectric resource becomes financially unviable so as to face sustained, reduced generation, it may be necessary to evaluate actions necessary to retain this baseline hydroelectric generation.

II. DISCUSSION AND PROPOSALS

II.a CLCPA Requirements

The CLCPA requires the Commission to establish a Program to require that:

> (a) a minimum of seventy percent of the state wide electric generation secured by jurisdictional load serving entities to meet the electrical energy requirements of all end-use customers in New York state in two thousand thirty shall be generated by renewable energy systems; and
>
> (b) that by the year two thousand forty (collectively, the "targets") the statewide electrical demand system will be zero emissions.
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> In establishing such program, the Commission shall consider and where applicable formulate the program to address the impacts of the program on safe and adequate electric service in the state under reasonably foreseeable conditions. The [C]ommission may, in designing the program, modify the obligations of jurisdictional load serving entities and/or the targets upon consideration of the factors described in this subdivision.[7]

Further, by July 1, 2024, and every two years thereafter, the CLCPA requires the Commission to issue, for notice and comment, a "comprehensive review" of the program that considers "(a) progress in meeting the overall targets for deployment of renewable energy systems and zero emission sources, including factors that will or are likely to frustrate progress toward the targets; (b) distribution of systems by size and load zone; and (c) annual funding commitments and expenditures."[8]

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[7] PSL §66-p(2).

[8] Id. at §66-p(3).

The CLCPA provides the Commission with authority to "temporarily suspend or modify" the obligations created by the Program if, after conducting a hearing, it finds that the Program: "impedes the provision of safe and adequate electric service"; "is likely to impair existing obligations and agreements"; and/or is related to "a significant increase in arrears or service disconnections."[9]

This section addresses three statutory issues relevant to the Commission's development and continued oversight of its program: (1) the status of non-jurisdictional load-serving entities (LSEs); (2) the definition of "renewable energy systems"; and (3) requirements related to disadvantaged communities.

II.a.1 Non-Jurisdictional LSEs

With respect to the 2030 Target, the CLCPA describes the program the Commission must establish as applying to "electric generation secured by jurisdictional load serving entities."[10] The CLCPA defines the term "jurisdictional load serving entity" as "any entity subject to the jurisdiction of the [C]ommission that secures energy to serve the electrical energy requirements of end-use customers in New York [S]tate."[11] The focus on jurisdictional LSEs means that the 2030 Target is aimed at all entities serving retail load within a regulated utility territory. This includes investor-owned distribution utilities (IOUs), energy service companies (ESCOs), Community Choice Aggregation programs (CCAs) not served by ESCOs, jurisdictional municipal utilities, and any retail customers self-supplying

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9 Id. at §66-p(4).

10 Id. at §66-p(2)(a).

11 Id. at §66-p(1)(a).

through the NYISO. The term would not include NYPA or the Long Island Power Authority (LIPA).

In the 2016 CES Order the Commission explained that, as part of State's goal that 50% of electricity be generated from renewable sources by 2030 (the 50 by 30 goal), NYPA and LIPA "will participate in the CES not only to conform to a carbon requirement but to engage in an integrated statewide policy."[12] As NYSERDA described in its most recent CES Annual Progress Report, NYPA and LIPA have committed to adopting renewable targets that achieve the CES mandate.[13]

The ambition of the CLCPA's 70 by 30 Target makes the need for an "integrated statewide policy" even more acute than it was for the 50 by 30 goal. In particular, it will be important to ensure ongoing coordination with NYPA and LIPA with respect to their participation in NYSERDA's procurements of environmental attributes. As an initial step, NYSERDA and DPS consulted with NYPA and LIPA on certain aspects of this White Paper that relate to their respective participation. NYSERDA and Staff expect that NYPA and LIPA will participate in the 70 by 30 Target, subject only to minor modifications as may be appropriate. As discussed further in Section II.c.1 below, NYPA and LIPA have agreed to notify NYSERDA annually by sending a report on how they have contributed to the achievement of the CLCPA Targets in the prior year, along with a notice indicating the extent to which they intend to participate in NYSERDA's annual CES procurements and/or fund their *pro rata* share of attributes procured by NYSERDA in the coming year. This information will

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12 Case 15-M-0302, supra, Order Adopting a Clean Energy Standard, p. 6 (issued August 1, 2016) ("2016 CES Order").

13 NYSERDA, Clean Energy Standard Annual Progress Report: 2018 Compliance Year (December 2019) at 6 - 8("2018 Progress Report").

be integrated into NYSERDA's public reporting as described below.

II.a.2 Definition of "Renewable Energy Systems"

For purposes of the 2030 Target, the CLCPA defines "renewable energy systems" as "systems that generate electricity or thermal energy through use of the following technologies: solar thermal, photovoltaics, on land and offshore wind, hydroelectric, geothermal electric, geothermal ground source heat, tidal energy, wave energy, ocean thermal, and fuel cells which do not utilize a fossil fuel resource in the process of generating electricity."[14] The CLCPA's definition of renewable energy systems differs in three notable ways from Appendix A of the 2016 CES Order, which listed the technologies eligible under the Renewable Energy Standard (RES) and which has guided NYSERDA's Tier 1 procurements.

First, the CLCPA's definition of "renewable energy systems" does not include biomass or biogas, which are currently eligible under the RES. Therefore, it is recommended that the Commission align future procurements conducted by NYSERDA with the eligible technologies defined under the CLCPA.[15] NYSERDA will, however, continue to perform under its existing biomass and biogas contracts, as obligated. Further, this White Paper recommends

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[14] PSL §66-p(1)(b).

[15] The Commission similarly rejected requests for utilities to continue entering into contracts for fuel cell projects disqualified under the CLCPA. See Case 15-E-0751, The Value of Distributed Energy Resources, Order Regarding Value Stack Compensation for High-Capacity-Factor Resources (issued December 12, 2019) (finding that "[i]t would be unreasonable and create additional costs for ratepayers to make additional commitments now that new overarching rules have been established.").

that the Commission determine that the Renewable Energy Credits (RECs) produced by biomass and biogas facilities subject to existing contracts continue to be eligible to satisfy LSEs' Tier 1 compliance obligations through 2029.

Second, Appendix A limited the hydroelectric resources eligible under Tier 1 of the RES to (i) the incremental production associated with upgrades to existing facilities without new storage impoundments, and (ii) low-impact run-of-river projects. The CLCPA, by contrast, includes all hydroelectric resources as "renewable energy systems." For future Tier 1 procurements, which are targeted to new projects, this White Paper proposes that NYSERDA continue to impose the same eligibility restrictions on hydropower that appear in Appendix A of the 2016 CES Order. However, as explained in Section II.c.3 below, this White Paper also proposes that the Commission authorize NYSERDA to procure RECs from certain types of hydropower under a new Tier 4, so long as the associated energy does not involve new impoundments and is shown to be additional to the supplier's baseline production of renewable energy.

Third, Appendix A included fuel cells as eligible technologies without regard to fuel source. The CLCPA includes fuel cells as "renewable energy systems," but only to the extent that they "do not utilize a fossil fuel resource in the process of generating electricity."[16] Therefore, this White Paper proposes that fuel cells be ineligible under the CES except when they utilize a non-fossil fuel resource, such as hydrogen (or other fuel) that has been produced using a "renewable energy system" as a primary energy source. For example, fuel cells that use hydrogen produced from natural gas or grid power would

[16] PSL §66-p(1)(b).

not qualify as renewable under the CES. However, hydrogen produced from an electrolyzer that demonstrates it is powered by renewable generation through a behind-the-meter facility, bilateral agreement, or other verifiable arrangement and that is ultimately used as a fuel to produce electricity (either through a fuel cell or via direct combustion) would be eligible to generate RECs. RECs generated in that manner should carry the environmental attributes of the electricity used to produce the hydrogen in the first instance, whether that is Tier 1, Tier 2, etc.

As stated above for biomass and biogas, although fuel cells that use hydrogen produced from natural gas should not be procured going forward, NYSERDA will continue to perform under all active fuel cell contracts. As with biomass and biogas, this White Paper proposes that RECs produced from fuel cells subject to existing contracts that do not qualify under the CLCPA should continue to be eligible for Tier 1 compliance through 2029.

II.a.3 Disadvantaged Communities

The CLCPA directs the Commission to design the programs for achieving the 2030 and 2040 Targets "in a manner to provide substantial benefits for disadvantaged communities . . . including low to moderate income consumers, at a reasonable cost while ensuring safe and reliable electric service."[17] The CLCPA defines "disadvantaged communities" as "communities that bear burdens of negative public health effects, environmental pollution, impacts of climate change, and possess certain socioeconomic criteria, or comprise high-concentrations of low- and moderate- income households, as identified pursuant to

[17] PSL §66-p(7).

section 75-0111 of this article."[18] Section 75-0111 in turn creates a process through which the Climate Justice Working Group will establish criteria for identifying disadvantaged communities.[19]

Achieving the 70 by 30 Target will benefit disadvantaged communities in a number of important ways. Most notably, due to historic inequalities, disadvantaged communities are likely to bear the worst consequences of air pollution from fossil fuel-fired generation. This is true for criteria pollutants such as nitrogen oxides (NO_x), sulfur oxides (SO_x), and particulate matter. It is also true with respect to the effects of climate change, to which disadvantaged communities are often most vulnerable and least able financially to adapt. The steps that will be undertaken to reach the 70 by 30 Target will markedly reduce fossil fuel-fired generation in the State. The environmental and health benefits of reducing pollution from fossil fuel-fired generators will be shared broadly, but will likely have its greatest benefit in those communities that disproportionately bear the burden of that pollution today. In particular, because many of the communities experiencing the worst impacts of fossil fuel-fired generation are located downstate, the increased penetration of offshore wind energy and, if approved, energy from Tier 4 resources, will result in substantial public health benefits.[20]

In addition to the widely-shared benefits that will come from increasing the penetration of renewable energy statewide,

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[18] Environmental Conservation Law §75-0101(5).

[19] Id. at §75-0111.

[20] See e.g., NYSERDA, Offshore Wind Policy Options Paper at 113 (January 29, 2018) (detailing reductions in NO_x, SO_x, and particulate matter that will result from introduction of offshore wind energy into the downstate area).

the CLCPA requires the Commission to take steps to ensure reductions in emissions from peaker plants, many of which are located in low-income communities. The CLCPA states that the Commission shall: "[t]o the extent practicable, specify that a minimum percentage of energy storage projects should deliver clean energy benefits into NYISO zones that serve disadvantaged communities . . . and that energy storage projects be deployed to reduce the usage of combustion-powered peaking facilities located in or near disadvantaged communities."[21] The work to achieve this goal began before it was a legislative requirement and is in progress. In the 2018 Energy Storage Order, the Commission adopted a statewide energy storage goal of installing up to 3,000 MW of qualified storage energy systems by 2030, with an interim objective of 1,500 MW by 2025.[22] To advance this goal, the Commission directed the State's IOUs to issue Requests for Proposals (RFPs) to procure dispatch rights from bulk-level energy storage systems sited within their service territories. The Commission further required the IOUs, in evaluating storage bids, to consider local environmental benefits derived by reducing use of peaking units. Those RFPs were issued in 2019 and, per the Energy Storage Order, must result in minimum quantities of operational resources by December 2022.[23]

The CLCPA also ensures that disadvantaged communities and low-to moderate-income (LMI) consumers will be explicitly

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21 PSL §66-p(7)(a).

22 Case 18-E-0130, In the Matter of Energy Storage Deployment Program, Order Establishing Energy Storage Goal and Deployment Policy (issued December 13, 2018).

23 Id. at 55 (directing Con Edison to procure 300 MW of bulk dispatch rights from resources that will be operational by December 2022 and the State's other IOUs to each procure at least 10 MW.)

considered in receiving the benefits of energy efficiency programs and distributed renewable energy located in their communities. Although distributed energy and energy efficiency programs are not the subject of this White Paper, these programs bear mention here in considering the Commission's overall approach to ensuring that disadvantaged communities and LMI consumers benefit from the energy transition. Regarding distributed solar, the CLCPA requires that NYSERDA "consider enhanced incentive payments for solar and community distributed generation projects, focusing in particular but not limited to those serving disadvantaged communities . . . which result in energy cost savings or demonstrate community ownership models."[24] In a petition recently addressed by the Commission, NYSERDA proposed an expansion of the NY-Sun program intended to fulfill this requirement and to "dramatically advanc[e] access to solar energy for LMI customers, environmental justice communities and disadvantaged communities."[25] In its May 14, 2020 Order Extending and Expanding Distributed Solar Incentives, the Commission approved NYSERDA's proposal to allocate $135 million for additional incentives for projects benefitting LMI customers, affordable housing, and environmental justice and disadvantaged communities as well as at least $65 million of MW Block and Community Adder incentives supporting the projects that receive those additional incentives.[26]

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[24] PSL §66-p(7)(b).

[25] See, Case 19-E-0735, Proceeding on Motion of New York State Energy Research and Development Authority Requesting Additional NY-Sun Program Funding and Extension of Program Through 2025, Petition of New York State Energy Research and Development Requesting Additional NY-Sun Program Funding and Extension of program Through 2025 (filed November 25, 2019.

[26] See, Case 19-E-0735, supra, Order Extending and Expanding Distributed Solar Incentives, (issued May 14, 2020).

With respect to energy efficiency, the CLCPA requires the Commission to "include mechanisms to ensure that, where practicable, at least twenty percent of investments in residential energy efficiency, including multi-family housing, can be invested in a manner which will benefit disadvantaged communities . . . including low to moderate income consumers."[27] In its January 16, 2020 Order Authorizing Utility Energy Efficiency and Building Electrification Portfolios through 2025,[28] the Commission authorized substantial new utility investments in energy efficiency, incorporating the requirement that no less than 20% of incremental funding go to dedicated LMI programs, and authorizing NYSERDA to allocate $30 million to LMI heat pump programs.[29] Further, the State's IOUs and NYSERDA were directed to develop a statewide LMI portfolio, to include the incremental energy efficiency funding and investments in energy affordability and access through the Clean Energy Fund. The IOUs and NYSERDA will soon file with the Commission an LMI Portfolio Implementation Plan that provides a comprehensive view of the LMI program goals and implementation strategies.

With respect to electric vehicles, the State is likewise committed to ensuring that the benefits extend to disadvantaged communities. In a January 2020 White Paper, DPS Staff proposed a DC Fast Charger program. The proposal would guarantee that 20% of each utility's budget under the program is directed to deployment of charging infrastructure within 10 miles of a disadvantaged community, to increase access to EV charging

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[27] PSL §66-p(6).

[28] See Case 18-M-0084.

[29] Id. at 47 & 83.

infrastructure and to increase electric miles driven by ride-hailing services in and around those communities.[30]

The CLCPA also includes a mechanism for tracking progress toward ensuring that LMI and disadvantaged communities share the benefits of the clean energy transition. The CLCPA requires the Commission to direct NYSERDA and IOUs to "develop and report metrics for energy savings and clean energy market penetration in the low and moderate income market and in disadvantaged communities . . . and post such information on the authority's website."[31] NYSERDA will work with DPS over the course of 2020 to develop a framework for tracking market penetration and energy savings associated with the allocation of ratepayer funds in the LMI market, building on the data that is currently available in the Clean Energy Dashboard. Upon the establishment of criteria for disadvantaged communities by the Climate Justice Working Group, NYSERDA will incorporate disadvantaged communities into the metrics tracking and reporting framework. Achieving the 70 by 30 Target also creates a vast economic opportunity. According to NYSERDA's 2019 Clean Energy Industry Report,[32] New York has created nearly 159,000 clean energy jobs across the State since 2016, representing an 8.9% increase in this sector (more than double the job growth in the State's overall economy). Getting to 70 by 30 will require still further investment and job growth throughout the renewable energy supply chain.

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30 See Case 18-E-0138, Proceeding on a Motion of the Commission Regarding Electric Vehicle Supply Equipment and Infrastructure, (filed January 13, 2020 at 56).

31 PSL §66-p(7)(c).

32 NYSERDA, 2019 New York Clean Energy Industry Report at 3.

New York State's clean energy strategy has and will continue to take steps to ensure that these new investments result in jobs for New Yorkers that provide family-sustaining wages and benefits. In addition to a $70 million commitment to fund clean energy workforce development, NYSERDA has structured its CES procurements to promote sound employment practices. As a current practice in its large-scale renewables procurements, NYSERDA requires contractually that construction work on selected projects pay the prevailing wage. And, through its selection process, NYSERDA rewards bidders that invest in workforce development. Further, beginning in its 2020 Tier 1 and offshore wind solicitations, NYSERDA will explicitly incorporate community engagement and prioritization of benefits to disadvantaged communities into its selection process. Bidders will be required to describe impacts to disadvantaged communities associated with their proposals and NYSERDA will reward those proposals that will confer benefits to disadvantaged communities, including economic benefits and job creation. As additional opportunities are identified to bring benefits to disadvantaged communities, NYSERDA intends to further advance and evolve this approach.

II.b Meeting the 70 by 30 Target

This section estimates the quantity of new renewable energy required to meet the 70 by 30 Target, which is derived by estimating statewide electric load in 2030 and subtracting the contribution of currently-operating and already-contracted renewable energy projects. The purpose of this section is to provide initial targets in energy terms (GWh) that can guide procurement, principally through the Tier 1 and offshore wind programs. These initial estimates will be updated, and the procurement targets refined, as the decade progresses.

i. Electric Load Forecast

Statewide load in 2030 will be influenced in countervailing ways by the CLCPA's wider greenhouse gas reduction targets. At the same time that the State decarbonizes electric generation, it will be ambitiously pursuing electrification of heating and transportation, as well as energy efficiency. The 2030 load projection, therefore, incorporates decarbonization measure estimates across all sectors at levels necessary to achieve the CLCPA requirements. The resulting statewide electric load in 2030 is forecast to be 151,678 GWh of wholesale energy requirements. This total adjusts for line losses and includes load served by behind-the-meter resources such as rooftop solar. This total includes (1) 10,334 GWh of additional load associated with new demand from air- and ground-source heat pumps, which equates to 21% of primary building heating system stocks by 2030, and (2) 9,048 GWh of additional load from electric vehicles and electric load, which equates to 17% of on-road vehicle stocks by 2030. In comparison to the 2019 NYISO Gold Book topline forecast (excluding load impacts of electric vehicles, storage and energy efficiency), this projection

includes 40,865 GWh of demand reduction from energy efficiency. This energy efficiency projection reflects annual adoption rates of efficient lighting, Heating Ventilation Air Conditioning (HVAC), and non-HVAC appliance equipment at the end of the useful life of existing, less-efficient stock reaching 100 percent by 2025, with that rate being sustained through 2030. In addition, annual adoption by 2030 of efficient building shell measures is projected to reach 85% of all annual turnover, including retrofits and new construction (assuming an effective 20-year building shell lifetime).

This White Paper proposes to use the 2030 load projection of 151,678 GWh as the initial basis for formulating procurement targets. As with any projection, the 151,678 GWh projection at issue here is subject to substantial initial uncertainty, and will be updated annually through the Divergence Test process as described below.

ii. 70 by 30 Target Quantification

Multiplying the 2030 load projection of 151,678 GWh by 70% yields an estimated 106,174 GWh of renewable electricity that must be operating in 2030 to meet the Target. As Table 1 below shows, of that 106,174 GWh, 63,317 GWh is already either in operation, under contract, or – in the case of the 2025 6 GW photovoltaic solar requirement – separately determined by statute.

Table 1

70 by 30 Target Contributions from Commitments to Date

(GWh/ year)

2018 renewable generation[33]	39,013
Contracted and constructed Tier 1 RES projects[34]	8,952
Contracted offshore wind projects[35]	7,985
NY-Sun 6 GW target by 2025[36]	7,366
Total	**63,317**

Subtracting the 63,317 GWh total in Table 1 from the 2030 target of 106,174 GWh yields 42,858 GWh. That is the incremental quantity of renewable energy that must be deployed through the Offshore Wind and RES Standards collectively.

As detailed in Section II.c.2 below, this White Paper proposes an offshore wind procurement schedule that averages

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33 The figure shown reflects generation from CLCPA eligible sources, see 2018 Progress Report at 12, less distributed solar PV (which is accounted in the NY-Sun 6 GW target), adjusted for estimated attrition or degradation of generation by 2030. No adjustment has been made to reflect potential future weather-related fluctuation of generation levels by 2030; as and when such fluctuation may occur, the RES flexibility mechanisms can be employed to adjust targets as needed.

34 Reflects contracts issued to Tier 1 projects to date by NYSERDA and NYPA, adjusted for an assumed 20% attrition rate; includes operational Tier 1 projects.

35 Includes projected generation from the Empire Wind and Sunrise Wind projects procured by NYSERDA in 2018 as well as the South Fork offshore wind project contracted by LIPA in 2017.

36 NY-Sun encompasses both community-scale projects and on-site, "behind the meter" generation. Because target calculations are expressed at the generation level before transmission losses, the behind-the-meter component was grossed up by a 7.2% line loss factor to reflect its contribution in terms equivalent to other generation sources.

just under 1 GW annually through 2027. This schedule is designed to meet the CLCPA requirement of 9 GW of offshore wind operating by 2035, and includes time for make-up procurements should one or more selected project fail to develop as proposed. NYSERDA and Staff estimate that, adhering to this schedule, an appropriately conservative estimate of total offshore wind capacity that will be online by 2030 is 5.8 GW, producing an estimated 17,868 GWh/year incremental to the projects already contracted.

Subtracting the estimated 17,868 GWh/year of additional offshore wind energy from the overall total of 42,858 GWh/year, yields an estimated balance of 24,990 GWh/year that must be realized through other RES programs, chiefly Tier 1. As explained below, this White Paper proposes the creation of Tier 4 of the CES for the environmental attributes of renewable energy delivered to zone J. Any amounts procured through Tier 4 would reduce the amount that must be procured through Tier 1. Likewise, distributed solar will continue to deploy after the 2025 6 GW goal is achieved, which would also reduce the total amount needed through Tier 1.

Table 2

Estimated 70 by 30 Target Contributions

	GWh/ year	% of 2030 Load
2018 renewable generation	39,013	25.7%
Contracted and constructed Tier 1 RES projects	8,952	5.9%
Contracted offshore wind projects	7,985	5.3%
NY-Sun 6 GW target by 2025	7,366	4.9%
New offshore wind procurements	17,868	11.8%
Remaining RES procurements	24,990	16.5%
Total	**106,174**	**70%**

iii. Cost and Benefit Analysis

NYSERDA has conducted an analysis of the costs and benefits of the incremental Tier 1 and offshore wind procurements discussed above. NYSERDA estimates that the proposed Tier 1 procurements, as set out in Section II.c.1 below, – from 2021 to 2026 – would lead to a levelized impact on electricity bills of less than 0.5% (or $0.35 per month for the typical residential customer). Taking into account the value of the avoided carbon emissions, these procurements are estimated to yield a net benefit of around $7.7 billion over the lifetime of the projects. Factoring in reductions in other types of air pollutants, not quantified here, would further increase the net benefits of these procurements.

NYSERDA has also analyzed the costs and benefits of the incremental offshore wind procurements from 2021 required to reach the 2035 9 GW goal. NYSERDA estimates that these proposed procurements would lead to a levelized impact on electricity bills of less than 1.1% (or $0.81 per month for the typical residential customer). Taking into account the value of the

avoided carbon emissions, these procurements are estimated to yield a net benefit of almost $9.6 billion over the lifetime of the projects. Of these offshore wind procurements, an incremental 3 GW procured from 2021 is projected to be installed in time to contribute to the 70 by 30 goal. This is estimated to lead to a levelized electricity bill impact of less than 0.9% (or $0.68 per month for the typical residential customer) and a net benefit after accounting for carbon value of around $4.0 billion.

This analysis was conducted in accordance with the Commission's 2016 Benefit Cost Analysis (BCA) Framework Order,[37] which directs taking account of electric system values as well as carbon externalities. The BCA Framework Order also discussed non-carbon externalities by noting that reduction in pollutants such as SO_x, NO_x and PM 2.5 are certain to provide meaningful and positive health benefits. The Commission elected not to attempt to monetize those non-carbon externalities in the BCA Framework Order at that time, but plans to return to the issue for later consideration.

In this instance, the evidence indicates that there are meaningful benefits, especially health benefits, from the proposed level of renewable energy deployment, above and beyond the positive BCA analysis performed here. Burning fossil fuels results in air pollutants that are responsible for many adverse impacts, including health effects. Any and all renewable energy generation that reduces the burning of traditional fuels avoids such negative effects. Especially as relates to downstate, offshore wind and other zero-emission energy located proximately

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[37] See Case 14-M-0101, Proceeding on a Motion of the Commission in Regard to Reforming the Energy Vision, Order Establishing the Benefit Cost Analysis Framework, (issued January 21, 2016).

to the two largest load pockets in the State — New York City and Long Island — could cause significant improvements local air quality and public health. Reducing emissions is particularly important for the New York City metropolitan area, which has a high population and high density of emissions sources.

NYSERDA and Staff believe that these key findings reaffirm the positive impact of the CLCPA targets. Further details on inputs, methodology, and results from NYSERDA's analysis are set out in Appendix A.

II.c Proposed Reforms to the CES

II.c.1 Tier 1 Procurements

To meet the 70 by 30 Target while ensuring reliability and protecting consumers, the process for procuring Tier 1 RECs must adapt in three fundamental ways. First, while it remains uncertain precisely how much renewable energy must be procured through Tier 1, NYSERDA must prepare for the possibility that procurement volumes will increase substantially. As explained in Section II.b above, meeting the 70 by 30 Target will require on the order of 24,990 GWh from new Tier 1 resources beyond those already procured.[38] To ensure that selected projects are operating in 2030, these amounts should be procured in total no later than 2026. Assuming a 20% attrition rate for selected Tier 1 projects, statewide procurement totals will need to average almost 4,500 GWh annually over the 2021 to 2026 period in order to meet the 2030 Target.[39] While both jurisdictional LSEs and non-jurisdictional entities may self-procure a portion of this amount, to the extent the full procurement role would be fulfilled by NYSERDA, this would constitute a roughly 40% increase over procurement levels over the past three years, during which NYSERDA has averaged about 3,200 GWh/year.

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[38] These procurement totals include the loads served by NYPA and LIPA. See Section II.a.

[39] This figure assumes that NYSERDA's 2020 Tier 1 solicitation will result in a procurement volume roughly equivalent to that of the following years.

Table 3

Recent Tier 1 Procurement Totals

	Anticipated Target (GWh)	Procured Qty. (GWh)
2017	1,443	3,283
2018	1,483	3,873
2019	1,524	2,557

Second, meeting the 70 by 30 Target increases the importance that contracted projects are truly viable. While some project failure is inevitable, it will not be possible for the Tier 1 procurements to play their necessary role in getting to 70 by 30 without comparatively low and predictable rates of attrition, along with timely project development and construction. As noted above, the 4,500 GWh/year average annual procurement estimate assumes an attrition rate of 20%. Meeting that rate while simultaneously procuring greater volumes will require heightened emphasis on project viability.

Third, as the penetration of Tier 1 resources increases cumulatively, NYSERDA will need to pay increased attention to the interactive effects among them, including the potential for curtailment,[40] the need for dispatchable resources within the system mix, complementary transmission development, and local reliability dynamics.

With these three basic shifts in mind, this White Paper recommends that the Commission authorize the following adjustments to the Tier 1 procurement process:

[40] Of particular concern is the prospect for renewable generation to cause the curtailment of, or to be itself curtailed by another renewable resource.

i. *Annual Procurements with Flexible Targets*

This White Paper recommends that the Commission authorize NYSERDA, beginning in 2021, to conduct annual Tier 1 procurements in amounts necessary to achieve the 70 by 30 Target, but with neither minimum nor maximum quantity limitations in any given year. NYSERDA should have the flexibility to respond to market conditions, which may mean procuring substantially more or less in any given solicitation than the currently-estimated statewide quantity of 4,500 GWh/year. Instead of the currently-required Minimum and Anticipated Procurement Targets, this White Paper recommends a process in which, by means of the Divergence Test process, NYSERDA annually revises the average annual amount required to reach the 70 by 30 target based on the latest data.

The first step in this annual process will be to take account of the participation of LSEs in the NYSERDA procurement process. As noted above, NYPA and LIPA have agreed to notify NYSERDA annually with respect to the their intent to participate in NYSERDA's upcoming annual Tier 1 CES procurements, or whether they intend to self-procure, as well as to report on how they plan to meet their respective shares of the statewide CLCPA goals. Likewise, jurisdictional LSEs that intend to meet their Tier 1 compliance obligation through self-supply should notify NYSERDA in writing, with sufficient detail to provide NYSERDA assurance that the self-supply strategy will succeed.

Having assessed LSE participation, this White Paper proposes that NYSERDA next revise the average annual procurement target through the Divergence Test.[41] This analysis will adjust

[41] The topics covered in this White Paper include those that would otherwise be addressed through the annual Tier 1

the procurement totals based on new information regarding attrition among selected projects, changes in load, and project development under other programs, such as the Offshore Wind Standard, NY-Sun, and Tier 4, if approved. Due to the depth of analysis that will be required annually to ensure progress toward the CLCPA goals and the newly required biennial review process, the current Triennial Review process will become both duplicative and untimely. Accordingly, this White Paper recommends ending the Triennial Review process after 2020.

Finally, this White Paper proposes that NYSERDA no longer be required to conduct make-up solicitations if the average target is not met.[42] As described, to be useful the annual targets must be subject to periodic change. Make-up solicitations, if required, would threaten NYSERDA's ability to prepare the required analyses for each solicitation in a timely fashion and would compromise the efficacy of portfolio-level assessments. Instead, the following year's regular solicitation would provide the opportunity to address any shortfall.

ii. Removal of Projects Not Presently Viable

Presently, project viability receives a 10% weight in the Tier 1 bid evaluation process. In this and the following subsection, this White Paper recommends two changes to the way project viability is considered. First is the recommendation

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Divergence Test, namely review and publication of procurement targets and LSE compliance targets. Accordingly, the 2020 Divergence Test is subsumed within this White Paper and will not be published separately.

[42] The 2016 CES Order included both anticipated and minimum annual targets, and required NYSERDA to conduct a second solicitation in any year during which procurement under the first solicitation fell below the minimum. 2016 CES Order at 16, 113.

that the Commission authorize NYSERDA to reject a proposal outright upon a unanimous determination by the Technical Evaluation Panel (TEP) that the project is not presently viable. The TEP will be instructed to make that determination if it finds that (i) the project is in such a state of immaturity that it is impossible to ascertain whether it is viable, or (ii) the project appears to be predicated on unrealistic economic or regulatory assumptions, or faces serious economic or regulatory risks for which the project developer has not provided satisfactory mitigation plans.

In making this judgment, the TEP may be guided by each solicitation's Threshold Eligibility Criteria, which NYSERDA has been authorized to update from time to time.[43] But if the TEP members unanimously find that a project is not presently viable, they should not be constrained by the possibility that the project has met the letter of the Threshold Eligibility Criteria. The TEP members that NYSERDA engages to evaluate proposals are highly qualified individuals with extensive experience in the financing, development, and risk analysis for renewable energy projects. The Threshold Eligibility Criteria are not exhaustive and are not intended to displace the TEP's professional judgment. If the TEP reaches such a decision, the project would be removed from consideration without completing the scoring process and the applicant would be notified. Applicants rejected in this manner would be free to re-apply in future RES solicitations, and would be evaluated again without prejudice.

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[43] See Case 15-E-0302, supra, Clean Energy Standard Final Phase 1 Implementation Plan at 17 – 22 (filed March 24, 2017) ("Final Phase 1 Implementation Plan").

This White Paper recommends this change on the grounds that, while the 10% weight allocated to project viability is sufficient for differentiating among projects that have a reasonable likelihood of success, it is inadequate for screening out projects unlikely to succeed. For such projects, a binary determination will better serve program goals. For instance, under the current scoring rubric, a project that offers a very low, perhaps an unrealistically low REC price could score well enough on the price criterion to be selected, despite receiving the lowest possible score on the project viability criterion, and despite a consensus by the TEP that the project has no prospects for success. Selecting projects for award in such circumstances – at the expense of viable projects – would frustrate the State's ability to meet the 70 by 30 Target. Finally, NYSERDA and Staff note that the Commission recently authorized a similar approach to project viability in offshore wind procurements.[44]

iii. Consolidate Project Viability, Operational Flexibility and Peak Coincidence Evaluation Factors

Currently, in Tier 1 solicitations NYSERDA assigns a 10% weight to project viability and a 10% weight to "operational flexibility and peak coincidence." This White Paper proposes that these two categories merge into a single category, called "Project Viability, Operational Flexibility and Peak Coincidence," weighted at 20%. The reason for the proposed change is that the considerations in the "operational flexibility and peak coincidence" category will be increasingly intertwined with project viability as the penetration of

[44] See Case 18-E-0071, In the Matter of Offshore Wind Energy; Order Authorizing Offshore Wind Solicitation in 2020 (issued April 23, 2020) at 18 & fn 16 (2020 Offshore Wind Order).

renewable energy increases. Projects that are operationally flexible (dispatchable) and peak coincident will also be those mostly likely to avoid curtailment, local reliability constraints, and burdensome interconnection requirements. Consolidating these categories will allow evaluators to better reward projects that are truly exceptional across these metrics.

iv. Broaden Portfolio Risk Factors

The CES Final Phase 1 Implementation Plan, approved in connection with the 2016 CES Order, includes a portfolio risk assessment to be performed after the TEP has produced a preliminary ranking of bid facilities. The Implementation Plan authorizes NYSERDA and DPS to direct the TEP to apply limits to the portfolio as a whole, so long as those limits do not increase the generation-weighted average cost of the portfolio by more than 10%.[45] Those limits are: an 80% limit on any one technology type, an 80% limit on any one project owner (including affiliates), and a limit on specific project owners such that no project owner may be awarded a capacity more than five times greater than the renewable capacity that the owner has successfully brought to commercial operation in the past.[46]

This White Paper recommends that the Commission permit NYSERDA to develop new portfolio risk factors[47] intended to take account of the interactive effects caused by the increasing penetration of renewable energy resources on the grid. These risk factors cannot be addressed by individual proposers because they generally lack comprehensive knowledge of other proposed

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[45] Id. at 26 – 27.

[46] Id.

[47] Along similar lines, NYSERDA's 2018 Offshore Wind RFP included a portfolio evaluation and the consideration of program policy factors. See NYSERDA, Request for Proposals ORECRFP18-1 §5.2.

projects. These new portfolio risk factors would include, but not be limited to: the geographic concentration of projects with similar generation profiles; portfolio-wide dependence on particular technology types; anticipated impacts of curtailment portfolio-wide; and impacts on network upgrade costs, congestion, and transmission development in general.

NYSERDA would develop any new portfolio risk factors in consultation with Staff, and would consult NYISO or utility staff as applicable. NYSERDA and Staff expect that the transmission development encouraged through the Accelerated Renewables Energy Growth and Community Benefit Act (Accelerated Renewables Act) will help to alleviate some of these concerns, and also that the transmission study required by that Act will provide helpful context for both developers and NYSERDA going forward.[48] Nevertheless, in light of the significant penetration of renewable energy to be deployed in coming years, this White Paper proposes that NYSERDA have the flexibility to consider these portfolio-level impacts.

For any new portfolio risk factor adopted, NYSERDA would publish a description in its RFP at a sufficient level of detail to allow bidders to make any responsive adjustments to their projects that may be possible. NYSERDA would also publish a description of how the portfolio risk factor would be used in the selection process.

Finally, as noted above, NYSERDA and Staff believe that achieving the 70 by 30 Target will require regulatory structures that give renewable generators the appropriate incentives to design projects in a manner that avoids curtailment and other negative impacts among generators. To that end, this White

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

Paper has proposed the reforms to the Tier 1 solicitation process described above. Further, this White Paper solicits public comment on whether additional measures to achieve these ends may be necessary. Such additional measures may include, but are not limited to, a procurement policy that, in agreements resulting from future procurements, NYSERDA would acquire without compensation any REC generated in hours and at locations where the applicable real-time LBMP is negative.

v. Clarification of CES Delivery Requirements

The CES Framework Order provided guidance on the ability of out-of-state intermittent renewable generators to participate in the Tier 1 solicitations and the requirement to ensure a contract path into the New York Control Area (NYCA). This guidance was based on experience from earlier Renewable Portfolio Standard programs. The CES Framework Order provided that out-of-state intermittent renewable generators that participate in Tier 1 solicitations may sell and transmit energy as it is generated into the spot market of the control area of its location without simultaneous transmission into the New York Control Area, so long as an equal quantity of energy is transmitted out of the affected spot market into the NYCA for end-use during the same hour as the renewable generation is produced (hourly matching). Under that approach, contractual deliveries associated with the out-of-state resource are recognized in each hour as the lesser of actual hourly metered energy production by the renewable generator or actual hourly energy delivered to the electric energy purchaser in the NYCA for end-use. In addition, if the control area of origin has a system to account for and track attributes or an environmental

disclosure program, it is required that such system and/or program recognize hourly-matched transactions without double counting the attributes in any jurisdiction.

In an effort to effectuate the Commission's stated objective that the State benefit environmentally from these imports, NYSERDA and Staff, with the advice of APX, Inc., the firm that administers the New York Generation Attribute Tracking System (NYGATS), have implemented a detailed hourly approach.[49] For these renewable generators located in a control area adjacent to the NYISO, the electricity associated with the RECs must be scheduled, transmitted, delivered, and settled in the NYISO energy market in each hour, and must be accompanied with documentation of a unit-specific contract path between the injection point in the control area of origin to the delivery point in New York. The documentation must include the provision of transmission rights for delivering the generation via the NYISO using the North American Electric Reliability Corporation (NERC) tag fields Sending and Receiving Control Areas and Purchasing/Selling Entity Name and Number. For imported RECs to be flagged as eligible for Tier 1, projects located in an adjacent control area will need to continuously demonstrate the delivery of energy and RECs into New York State through the requirements laid out in the Final Phase 1 Implementation Plan. Tier 1 eligible energy scheduled and delivered from external control areas must be accompanied by the NERC tag information from an outside organization such as the Open Access Technology International (OATI) System identifying the importing project as

[49] The above-described process is from the New York State Clean Energy Standard RES Tier 1 Certification, Submission Instructions and Eligibility Guidelines (May 2019), and is currently utilized by NYSERDA to qualify out-of-state intermittent renewable generators for Tier 1 status.

the source for the scheduled and transmitted electricity into the NYISO. NYSERDA uses the information from OATI or a similar system to ensure that the requirements set forth in the Final Phase 1 Implementation Plan have been satisfied. This White Paper proposes to continue using this approach to CES delivery requirements going forward.

II.c.2 Offshore Wind Procurements

i. Current Status

To date, NYSERDA and LIPA have together entered contracts for 1,826 MW of offshore wind. In 2017, LIPA entered a power purchase agreement with the South Fork Offshore Wind Farm. LIPA and the project developer subsequently agreed to expand that project from its initial design of 90 MW to 130 MW. In 2018, acting pursuant to the Commission's Phase 1 Order,[50] NYSERDA conducted its first solicitation for ORECs. From this solicitation, NYSERDA entered into contracts with Equinor Wind US LLC for the environmental attributes associated with its 816 MW Empire Wind Project and with Sunrise Wind LLC (a joint venture of Ørsted A/S and Eversource Energy) for its 880 MW Sunrise Wind Project. NYSERDA filed a report with the Commission detailing those procurements on October 23, 2019.[51]

In January 2020, NYSERDA submitted a petition with the Commission requesting authority to conduct a 2020 solicitation for at least 1,000 MW of ORECs, with flexibility to accept bids up to 2,500 MW. On April 23, 2020, the Commission granted NYSERDA's petition and issued an Order that extended the principles of the Phase 1 Order while recognizing the program's evolution.[52] Specifically, the 2020 Offshore Wind Order acknowledged the market's acceptance of the Index OREC pricing structure and directed NYSERDA to use a procurement mechanism

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[50] Case 18-E-0071, supra, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement (issued and effective July 12, 2018) ("Phase 1 Order").

[51] Case 18-E-0071, supra, Launching New York's Offshore Wind Industry: Phase 1 Report (filed Oct. 23, 2019) ("Phase 1 Report").

[52] See 2020 Offshore Wind Order.

consistent with the Commission's January 2020 Order governing procurements under the RES.[53]

ii. Requested Authorization to Procure up to 9 GW

NYSERDA has requested and received discrete authority from the Commission for each offshore wind procurement to date. Piecemeal regulatory approval was necessary while the offshore wind program was in its initial stages. Following the Phase 1 Order, however, NYSERDA conducted a successful solicitation in 2018 that validated the Index OREC mechanism and other aspects of its procurement approach.[54] Further, the CLCPA has established the requirement to develop at least 9 GW of offshore wind by 2035, codifying the overall size and end date goal of the offshore wind standard.

Accordingly, this White Paper recommends that the Commission formally adopt the CLCPA's minimum statewide goal of 9 GW of offshore by 2035 and grant NYSERDA authority to procure the remaining amount of ORECs necessary to achieve that goal. With 1,826 MW under contract statewide, approximately 7,200 MW remains to be procured to meet the CLCPA target. This remaining amount could be reduced up to 2,500 MW depending on the outcome of NYSERDA's 2020 solicitation, still leaving a significant amount left to meet the CLCPA's 9 GW requirement. This White Paper proposes that NYSERDA conduct offshore wind procurements in a manner that ensures, at a minimum, cumulative contracted capacity equivalent to between roughly 750 MW and 1,000 MW per year through 2027. Completing this planned procurement schedule by 2027 will ensure adequate time to meet the 9 GW goal,

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53 Case 15-E-0302, supra, Order Modifying Tier 1 Renewable Procurements ("Index REC Order") (issued January 16, 2020).

54 Phase 1 Report.

including an allowance of time for any supplemental procurements that may be necessary to replace previously selected projects that have not gone forward. This White Paper proposes that NYSERDA conduct these procurements annually, but with enough flexibility in timing to respond to market and regulatory dynamics, as well as to make adjustments based on its past record of procurements. For instance, if NYSERDA selects more than one large project in a single solicitation, there may be reason to cancel or delay a later solicitation.

In conducting its procurements, it is recommended that NYSERDA retain flexibility to respond to market conditions. Therefore, this White Paper proposes that NYSERDA have no minimum or maximum procurement requirements for any one solicitation. NYSERDA should be free take a long-term view and evaluate each contract award decision with focus on both ensuring CLCPA compliance and obtaining the best overall value.

By authorizing NYSERDA to proceed on this schedule, the Commission would provide a clear investment signal to the offshore wind industry. As the Commission has emphasized since the Phase 1 Order, the development of an offshore wind supply chain in New York State will be critical to reducing project costs while also delivering economic benefits to the State.[55] NYSERDA and Staff believe that an order from the Commission authorizing the schedule proposed above will provide the certainty that members of the offshore wind industry and supporting infrastructure need to invest in the State at scale.

[55] Phase 1 Order at 52.

iii. Transmission

In the Phase 1 Order, the Commission identified the "major strategic question" of "whether transmission facilities should be individually built to support single projects ('direct radial'), or developed via a shared radial 'backbone' to accommodate multiple projects."[56] The Commission explained that the "former approach . . . is simpler, more commonly used in offshore wind, and less risky to the timetable of initial projects; while the latter approach offers potential economies but at the cost of uncertainty and potential delay."[57] For the 2018 and 2020 solicitations, the Commission determined that NYSERDA should proceed with the radial approach.[58]

For the time being, the potential for backbone networks or other non-radial solution options remains speculative. The Bureau of Ocean Energy Management (BOEM) has yet to lease additional wind energy areas (WEAs) where eligible projects could be built, and it appears that no new WEAs will be available for lease until 2021 at the earliest. Without known locations for new lease areas, coordinated transmission solutions cannot be reasonably designed, proposed, or evaluated with any certainty.

Even so, NYSERDA and its State partners continue to study the potential for alternative transmission networks. This analysis includes detailed consideration of the views of industry and other stakeholders, state and federal permitting considerations, and an examination of the current constraints posed by the State's electrical grid. NYSERDA and its State

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[56] Id. at 54.

[57] Id.

[58] Id. at 56.

partners are also studying onshore transmission upgrades that will be necessary to accommodate 9 GW of offshore wind. Further, the recently-enacted Accelerated Renewable Act requires DPS, in consultation with NYSERDA, LIPA and NYPA, to undertake a "comprehensive study for the purpose of identifying distribution upgrades, local transmission upgrades and bulk transmission investments that are necessary or appropriate to facilitate the timely achievement of the CLCPA targets."[59] The initial report resulting from the study is due within 270 days of the Act's effective date. If warranted, NYSERDA would seek Commission approval to pursue alternatives to radial transmission through its offshore wind procurements.

iv. Other Offshore Wind Projects

To the extent that other offshore wind projects, like the South Fork Offshore Wind Project, are developed for delivery into the NYCA without NYSERDA's involvement, NYSERDA will reduce its own procurement targets accordingly. In this regard, this White Paper recommends that the Commission make clear that LSEs are free to procure ORECs directly for compliance and need not obtain them from NYSERDA. This White Paper also recommends that the Commission grant NYSERDA authority to re-sell ORECs to non-LSE buyers, provided that it do so at a cost no less than it sells to LSEs.

v. Great Lakes Wind

In recent years, offshore wind developers and/or energy regulators in Ohio, Illinois, and Michigan have taken steps to explore the potential of offshore wind in the Great Lakes,

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[59] Accelerated Renewable Energy Growth and Community Benefit Act §19(2).

primarily in relatively shallow Lake Erie. Renewable development in the Great Lakes, if feasible, could also play a key role in New York's path to a diversified clean energy economy.

This White Paper therefore proposes the development of a feasibility study for Great Lakes wind. A New York State Great Lakes Wind Feasibility Study would provide a broad assessment that considers wind energy development in Lake Erie and Lake Ontario through a framework that is sensitive to environmental, maritime, economic, and social issues while considering market barriers and costs. A feasibility study would also provide an appropriate level of data collection, analysis, public input, and strategic forethought that would allow all stakeholders and New York policymakers with the opportunity to consider the resource, its characteristics, and its potential contribution to achievement of the CLCPA goals.

The feasibility study would seek to identify areas offering the greatest opportunity and lowest risk for Great Lakes Wind development to characterize the technical and economic potential generation resource opportunity. To determine the actual generation potential, a new assessment of constraints will be critical. The feasibility study would provide an understanding of the overall value and viability of Great Lakes Wind and identify potential pathways for New York to realize its full potential.

An effective feasibility study would consist of three primary components: Stakeholder Outreach, Analysis, and Policy Options. Stakeholder outreach and engagement are critical components of an effective planning process. Outreach activities would include multi-modal interactions with a wide variety of governmental entities, industry, nonprofit and for-profit organizations, indigenous nations, and other communities,

groups and individuals that may, initially, be supportive or adversarial to the development of Great Lakes Wind projects. Engagement and input of this nature contributes to a more balanced evaluation of potential sites, potential opportunities, risks and the responsible development of potential projects.

An effort must be undertaken to gather and analyze existing data on environmental, social, economic, regulatory and infrastructure issues relevant to Great Lakes Wind development. These studies would assess the opportunities and challenges to advance this resource toward the achievement of the State's clean energy goals and cover a wide variety of topics. Existing data and resources pertaining to the Great Lakes would be aggregated and analyzed to characterize the resource and opportunity. Potential chapters of the study could include: Resource Characterization (e.g., wind resource assessment, generation potential, technology options), Planning Considerations (e.g., physical constraints, environmental/wildlife concerns, visual issues, environmental justice), Costs and Benefit (e.g., estimated energy and project costs, health and safety, greenhouse gas reduction), and Economic Development Considerations (e.g., supply chain, workforce opportunities).

At present, Great Lakes wind projects are eligible to compete in Tier 1 solicitations. At a future date, it may also be desirable to seek Commission authorization to allow Great Lakes wind projects to compete in OREC solicitations or consider other, more tailored procurement approaches or the advancement of demonstration projects. In the near term, however, Great Lakes wind projects are unlikely to be cost-competitive in either a Tier 1 or OREC procurement. Moreover, given that such projects would interconnect in the region of the State with the greatest proportion of renewable energy development relative to

native load, NYSERDA and Staff do not propose at this time to establish a separate tier to support Great Lakes wind over land-based or oceanic offshore wind projects. However, given the ambitious targets of the CLCPA, NYSERDA and Staff believe that a feasibility study to explore and confirm the potential long-term benefits of this resource is warranted.

II.c.3 Proposed Tier 4

A central challenge in achieving the 70 by 30 Target will be increasing the penetration of renewable energy consumed in the downstate region of the State. As NYISO has detailed in its "Tale of Two Grids" analysis, the upstate region, defined as NYISO load zones A – E, is supplied by 88% zero-emission resources, but accounts for only one third of statewide load. By contrast, the downstate region (zones F- K) accounts for roughly two thirds of statewide load but is supplied by 69% fossil fuel-fired generation.[60]

For New York City, this disparity is even more stark. New York City (Zone J) consumed 52,003 GWh in 2019, roughly a third of the statewide total of 155,832 GWh.[61] At the same time, nearly all of the roughly 22,500 GWh of electricity generated within New York City was from fossil fuel-fired generation.[62] Without displacing a substantial portion of the fossil fuel-fired generation currently operating within Zone J, the statewide 70 by 30 Target will be difficult to achieve. The location of fossil-fueled generation of this magnitude in the most densely populated area of the State only accentuates the need for change.

A key question arising from this challenge is whether existing programs under the CES will be sufficient to address it. Due to various factors, including the availability of developable sites, the Tier 1 program for new land-based renewable generation has, to date, resulted principally in upstate development. These projects increase the percentage of

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60 NYISO, Power Trends 2020 at 9.

61 NYISO, 2020 Load and Capacity Data: Gold Book at 19 ("Gold Book").

62 Id. at 94.

renewable energy imported into New York City. But, without new transmission capacity, the addition of new upstate renewables will not on its own increase the penetration of renewable energy consumed in the New York City to a level that enables statewide compliance with the 70 by 30 Target.

The NY-Sun program will continue to increase the deployment of distributed solar in New York City. Distributed solar is an effective tool for decarbonizing the New York City electric system, but on a limited scale. NYISO estimates that 213 MWdc of Solar PV was operating in zone J in 2019,[63] responsible for offsetting less than one percent of zone J load.[64] NYSERDA and Staff expect these quantities to increase several times over during the 2020 to 2030 period.

Of all existing programs, the Offshore Wind Standard has the greatest potential to increase the penetration of renewable energy in New York City. For example, the 816 MW Empire Wind project, which entered into an OREC contract with NYSERDA in 2019, will interconnect directly into zone J and will likely supply approximately 3,500 GWh/year, equivalent to roughly 7% of New York City load. As the State approaches the 9 GW target, the amount of offshore wind delivered into New York City will continue to increase. However, it is unclear at present how much offshore wind will be delivered to zone J as opposed to other zones. Further, resource diversity concerns may limit the extent to which New York City can rely solely on offshore wind to achieve the CLCPA requirements.

These concerns about the challenge of increasing the penetration of renewable energy in New York City lead NYSERDA and Staff to propose the creation of a new Tier 4 within the CES

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[63] Id. at 34.

[64] Id. at 35.

which is proposed to be distinct from the Offshore Wind Standard. Tier 4 would confront this challenge directly by extending financial support for renewable energy delivered into zone J and would be procured through a separate process than the procurement of offshore wind attributes. This White Paper is not recommending a separate tier with respect to Long Island at this time.

The following sections detail specific aspects of the Tier 4 proposal:

i. Resource Eligibility

The challenge of decarbonizing New York City's electric system warrants consideration of the broadest possible scope of renewable resources. This White Paper therefore proposes that any resource that qualifies as a "renewable energy system" under the CLCPA should be eligible under Tier 4, subject to the conditions below.

Like Tier 1, the proposed Tier 4 seeks to facilitate the delivery of additional renewable energy to New York. In Tier 1, additionality is ensured through the vintage requirement: an eligible project's date of commercial operation must be on or after January 1, 2015.[65] For all non-hydropower eligible resources under the CLCPA, this White Paper proposes to ensure additionality through a Tier 4 vintage requirement that an eligible project's date of commercial operation must be on or after the date of any Commission order that may result from this White Paper.

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[65] NYSERDA, Clean Energy Standard RES Tier 1 Certification: Submission Instructions and Eligibility Guidelines at 13 (May 2019).

As discussed in section II.a above, the CLCPA's definition of renewable energy systems includes any hydropower resource. Therefore, unlike Tier 1, under which only hydroelectric upgrades and "low-impact run-of-river" resources are eligible,[66] Tier 4 would be open to a broader set of resources. While NYSERDA and Staff believe that a broader set of hydropower resources should be eligible under Tier 4, this White Paper recommends that hydropower's eligibility under Tier 4 should be limited in two ways. First, as the Commission has explained previously, new hydropower impoundments can cause negative environmental impacts, including methane emissions that may undermine their efficacy as a mitigation tool.[67] Therefore, this White Paper recommends that Tier 4 be closed to any hydropower impoundment not already in existence or under construction as of the date of issuance of this White Paper.

Second, it is essential that the generation associated with Tier 4 RECs be additional to the supplier's baseline production. Nothing would be gained from purchasing the renewable attributes of energy that, absent the Tier 4 program, would have simply been delivered to a different buyer who would instead resort to reliance on fossil fuel-fired generation. This White Paper proposes an additionality requirement for Tier 4 that consists of two components, each of which must be satisfied: (i) a supplier energy baseline requirement, and (ii) a supplier Greenhouse Gas baseline requirement.

The supplier energy baseline requirement holds that Tier 4 RECs would only be compensated if and to the extent renewable generation is delivered to the NYCA that exceeds the historical baseline of renewable energy that the supplier and its

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[66] 2016 CES Order at Appx. A.

[67] Id. at 105 – 106.

affiliates have historically delivered to the NYCA. The purpose of this requirement is to ensure that Tier 4 deliveries are not met through re-directing the use of existing resources in a way that provides no net benefit to the State. NYSERDA and DPS recommend that the historical baseline for this requirement would be calculated using the average of the three most recently reported years prior to the establishment of Tier 4, and seek comments on this proposal.

The supplier Greenhouse Gas (GHG) baseline holds that Tier 4 RECs would only be compensated so long as the associated energy represents a net increase in the supplier's total renewable energy generation as compared to a baseline. The purpose of the supplier GHG baseline is to ensure that the energy associated with the Tier 4 RECs is not being backfilled by fossil fuel-fired resources supplied to the historic recipient of such energy. The supplier GHG baseline would be calculated, in MWh generated from renewable energy resources, using the average of the three most recent years prior to the establishment of Tier 4.[68]

This White Paper proposes that, to implement these additionality requirements, NYSERDA require that any entity seeking certification to create Tier 4 RECs in NYGATS (i) provide the detailed historical data necessary to determine the supplier energy baseline and supplier GHG baseline, and (ii) consent to the use of any tracking system and/or auditing regime that – in NYSERDA's judgment based on the circumstances of the

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[68] As of this writing, it appears that the impact of COVID-19 may render the year 2020 an anomaly for generation and emissions data. This White Paper therefore propose that NYSERDA be granted discretion to determine, in consultation with DPS staff, any corresponding adjustments to the baseline period necessary to formulate representative generation and emissions baselines.

individual supplier – may be necessary to verify continued compliance with the delivery and additionality requirements over the contract performance period.

ii. Delivery Requirement

Because the purpose of the Tier 4 program is to increase the penetration of renewable energy within zone J, the only environmental attributes that would create Tier 4 RECs would be those associated with demonstrable increased delivery of renewable energy into zone J. Applicants may satisfy the delivery requirement in two ways: by locating a utility-scale eligible resource directly in zone J, or by demonstrating that the eligible resource will be delivered using a new transmission interconnection into zone J. A transmission interconnection into zone J will be considered "new" if it electrically interconnects into zone J after the date of any Commission order authorizing Tier 4. Suppliers seeking to qualify under Tier 4 may demonstrate that their resource is deliverable into Zone J through documentation derived from the appropriate NYISO process. A determination by NYISO that the resource qualifies as a capacity resource for zone J would satisfy this requirement, but need not be the only basis upon which a resource may establish its ability to deliver renewable energy into zone J. And, to be clear, a resource need not participate in the zone J capacity market to generate Tier 4 RECs.

It bears emphasis that the purpose of this delivery requirement is to ensure that the State achieves its environmental goals, and not to direct any particular transmission development, siting, or cost allocation. The Tier 4 generators would bear all financial and regulatory responsibility for obtaining a zone J site or the necessary

transmission capacity to satisfy the delivery requirement. Moreover, this White Paper proposes that the NYSERDA procurement process described below should be neutral with respect to evaluating proposed transmission solutions, so long as the applicant demonstrates its ability to achieve the fundamental requirement of increasing the delivery of renewable energy into zone J, and that the applicant can or will comply with all state and federal regulatory requirements. Of note, the clarification regarding Tier 1 delivery requirements described in Section II.c.1 above that should be considered equally applicable to the proposed Tier 4.

iii. Pricing and Cost Containment

In the Index REC Order, the Commission authorized the Index REC procurement mechanism on the grounds that it may lower overall procurement costs.[69] For that same reason, this White Paper proposes that the Commission grant NYSERDA authority to solicit both Fixed and Indexed REC bids under Tier 4, using the same methodology described in the Index REC Order, with one exception noted below.[70] As it will do under Tier 1, in evaluating the price criterion, NYSERDA would compare Fixed and Index REC bids on a levelized net cost basis.[71]

This White Paper further proposes that the Commission direct NYSERDA to include a provision in any agreement with Tier 4 generators that would acquire without compensation any RECs generated in hours in which the real-time zone J energy price averages below zero. Further, as a consequence of this

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[69] Index REC Order at 3.

[70] Id. at. 21 – 26.

[71] Id. at 20 – 21.

provision, it is recommended that the Index REC reference energy price formula exclude any such negative LBMP hours.

This White Paper also proposes that any Tier 4 procurement authorized by the Commission be subject to a price cap. The purpose of this proposal is to increase the penetration of renewable energy in zone J by broadening the set of eligible resources, not by increasing REC prices. Accordingly, for generation projects that do not directly pay the cost of new transmission facilities, and therefore bear transmission costs comparable to projects typically selected under Tier 1, this White Paper proposes to cap the expected cost of any Tier 4 RECs at an amount benchmarked to prevailing Tier 1 REC prices. This White Paper solicits comment both on the most appropriate mechanism and/or formula for benchmarking the Tier 4 REC price cap to Tier 1 REC prices and, further, on whether a different price cap may be appropriate for projects that bear the cost of merchant-funded transmission, and thus avoid the need for socialized cost allocation.

iv. Procurement Quantity

This White Paper recommends that the Commission grant NYSERDA authority to procure environmental attributes from up to 3,000 MW of Tier 4 resources, through one or more solicitations, before seeking additional approval from the Commission. This White Paper also recommends that NYSERDA not be subject to any minimum Tier 4 purchase requirement. Having never undertaken a solicitation with these requirements, it remains uncertain whether viable, cost-competitive applications will be received. NYSERDA should be free to evaluate proposals without any obligation to enter a procurement transaction.

v. Solicitation Process and Contracting

This White Paper proposes that Tier 4 follow the same solicitation and contracting process established for Tier 1, subject to the few differences identified below. The Tier 4 solicitation process would begin with an open RFP accompanied by a standard form contract for the purchase and sale of Tier 4 RECs. Applications would be reviewed by NYSERDA and DPS Staff using the same evaluation criteria and weighting factors used for Tier 1 (including any changes to the Tier 1 evaluation criteria approved in response to this White Paper).

Once a bid is conditionally selected for award, NYSERDA and the applicant would negotiate final agreement terms. Given that Tier 4 applications may be beholden to relatively uncertain siting or transmission development timelines, this White Paper recommends that NYSERDA have the flexibility to negotiate commercial operation dates in Tier 4 agreements on an *ad hoc* basis depending on the applicant's documented project schedule. Further, as in the offshore wind context, this White Paper recommends that NYSERDA have authority to enter a contract with a tenor up to 30 years.

Alternatively, the price for the Tier 4 REC could be set via standard offer or directly negotiated between NYSERDA and a potential developer. Under this approach, the price for the Tier 4 REC could be set at a pre-determined or negotiated rate that takes into consideration relevant factors such as project-specific financial needs, costs, and benefits. However, this approach would maintain the cost containment mechanism proposed above by capping the payments at the Tier 1 REC price. This White Paper solicits comment on the process, parameters and pricing that the Commission may set by Order to guide such an approach.

vi. Joint Purchasing and Resale of Tier 4 RECs

For large projects involving new transmission facilities, it may be necessary for NYSERDA to enter into transactions involving more than one purchaser and/or to re-sell some of the Tier 4 RECs it has procured. There are two potential aspects of a multi-party arrangement that should be considered separately. First, a new transmission project delivering renewable energy into New York City may be of commercial interest to New York City LSEs or other large buyers, such as the city government itself. This White Paper therefore recommends that NYSERDA have discretion to purchase any percentage or fixed quantity of RECs delivered by a selected project, and to enter contractual arrangements with more than one entity as may be necessary. Further, if a seller has obtained fixed PPA pricing with a zone J LSE or end-user for some but not all of the energy from a project, this White Paper recommends that NYSERDA have authority to procure both Fixed and Index RECs separately from the same project, if doing so results in the lowest levelized net cost. To be clear, were NYSERDA to enter a multi-party transaction, its purpose would be to advance the statewide aims of the CLCPA by realizing economies of scale through the collective purchasing power of state and municipal agencies, not to provide any subsidy or local benefit to any individual LSE or New York City.

Second, RECs delivered to zone J may be eligible for compliance with New York City's Local Law 97.[72] That law requires reductions in building emissions, but authorizes the use of RECs delivered to zone J as an alternative means of

[72] Local Laws of the City of New York For the Year 2019, No. 97 ("Local Law 97").

compliance.[73] New York City building owners may also, therefore, have an interest in purchasing Tier 4 RECs. To help defray the cost of the Tier 4 program, this White Paper recommends that the Commission grant NYSERDA authority to re-sell the Tier 4 RECs it procures through an open offer in which any purchaser, including Local Law 97 compliance entities, may participate. This White Paper recommends that NYSERDA price such offers competitively, subject to a price floor set at its own net levelized procurement costs (including administrative costs). NYSERDA and Staff seek public comment on whether re-sales of Tier 4 RECs should be subject to an additional price floor calculated based on the social cost of carbon.[74] Further, NYSERDA and Staff seek comment on whether, if NYSERDA receives revenue from the re-sale of Tier 4 RECs that exceed its procurement costs, how such excess revenues should be directed.

This White Paper further recommends that NYSERDA have authority to conduct such sales annually through compliance year 2029. For 2030 onward, NYSERDA and Staff recommend that renewed Commission approval be required based on a finding that continuing such sales is consistent with the public interest and the purposes of the CLCPA.

vii. LSE Compliance

This White Paper proposes that, because Tier 4 is an integral component of achieving the statewide 70 by 30 Target, it should be the financial responsibility of all LSEs serving retail load in the territory of electric distribution companies

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[73] Id. (adding Administrative Code § 28-320.6.1).

[74] See Environmental Conservation Law § 75-0113(2) ("The social cost of carbon shall serve as a monetary estimate of the value of not emitting a ton of greenhouse gas emissions.").

(EDCs). These LSEs encompass investor-owned distribution utilities, ESCOs, CCAs not served by ESCOs, jurisdictional municipal utilities, and any retail customers self-supplying through the NYISO. Other non-jurisdictional LSEs, such as LIPA and NYPA, would be expected to adopt Tier 4 targets that are proportional to their load and reflect the Statewide goal. As part of NYPA and LIPA's annual report to NYSERDA, they will also report on their intent to participate in NYSERDA's upcoming annual Tier 4 CES procurements.

As proposed, NYSERDA would purchase Tier 4 RECs from eligible suppliers, on behalf of LSEs. After selling a portion Tier 4 RECs as described above, NYSERDA would sell the remaining Tier 4 RECs to the LSEs for compliance with the LSEs' obligation. Each LSE would be obligated to purchase qualifying Tier 4 RECs in proportion to its overall share of statewide load. The program would be administered in a manner similar to the process approved by the Commission for the zero emissions credit program.[75] The contracts between NYSERDA and the LSEs for Tier 4 would be based on forecasts of load, and would utilize a balancing reconciliation at the end of each program year such that each LSE will have purchased the correct proportion of Tier 4 RECs on an annual basis.

NYSERDA would sell Tier 4 RECs to LSEs at a price that reflects its net procurement costs – including a deduction of any revenue received from the sale of Tier 4 RECs through an open offer as described above. This White Paper further recommend that any LSE that has obtained Tier 4 RECs independent of their statewide obligation may retire those Tier 4 RECs and reduce their pro-rated Tier 4 purchase obligation commensurately.

This White Paper proposes that NYSERDA file an implementation plan for stakeholder comment, that will include a description of the compliance obligation calculations, process and structure, as well as a standard purchase agreement for ultimate Commission approval.

II.c.4 Tier 2

Tier 2 of the RES is presently governed by the Commission's Baseline Order issued March 16, 2018.[76] The Baseline Order refined the project-specific mechanism for awarding three-year support contracts for "baseline resources," which are renewable resources that commenced operation prior to January 1, 2015. Providing a means to ensure that economic baseline resources continue to operate and that their energy continues to serve New York load will grow in importance over the next decade as numerous ten-year RES contracts entered in the 2010s expire.

On January 24, 2020, recognizing the contributions and ongoing issues with the financial viability of the existing renewable baseline delivering to New York, NYSERDA filed a petition (Tier 2 Petition)[77] proposing a Competitive Tier 2 Program for baseline renewable generation. Eligible resources under NYSERDA's proposal would be non-state-owned run-of-river hydropower and wind generators that entered commercial operation prior to January 1, 2015. Existing resources that do not fall within the CLCPA's definition of "renewable energy systems" would be ineligible. Funding for the Competitive Tier 2 Program, which would be capped at $200 million across the three proposed annual solicitations, would be recovered through a new Tier 2 REC obligation imposed on LSEs.

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[76] Case 15-E-0302, supra, Order Adopting Measures for Retention of Existing Renewable Baseline Resources (issued and effective March 16, 2018) ("2018 Baseline Order").

[77] Case 15-E-0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard, Petition Regarding Clean Energy Standard, Competitive Tier 2 Program for Baseline Renewable Generation (filed January 24, 2020).

The Tier 2 Petition proposed to size the overall program to include the majority of eligible generation, but to limit annual procurement volumes so as to promote competition and lower cost bids. In each year of the proposed three-year program, NYSERDA would issue RFPs for approximately one third of the total eligible generation. This approach was designed to give most eligible resources an opportunity to receive an award in each three-year cycle. Unpurchased RECs would be available for voluntary market purchase by CCAs, ESCOs, or any other interested entities. This White Paper seeks comments on whether NYSERDA should also be authorized to resell Tier 2 RECs to such entities.

Further, this White Paper seeks comments with respect to NYPA's participation under the proposed Competitive Tier 2 program. Specifically, NYPA through its comments addressing the Tier 2 Petition, stated that, as part of its voluntary compliance with the CES goals, if the baseline generation from its hydroelectric resources is deemed Tier 2-eligible, it would retain and retire sufficient environmental attributes from its existing hydroelectric resources (self-supply) to meet the Tier 2 program targets in accordance with its share of statewide load.

With respect to a new Tier 2 obligation for LSEs, NYSERDA and DPS recommend that additional consideration be given to the role NYPA will play, if any, in procuring Tier 2 RECs – presuming the Commission ultimately approves a new Competitive Tier 2 Program. Because NYPA has characteristics of a utility that provides transmission services, procures energy and capacity pursuant to contracts on behalf of its customers, while also owning resources that could potentially generate Tier 2 RECs, NYPA is in a unique position in relation to other LSEs. Since the Tier 2 Petition did not address NYPA's participation

in the proposed competitive Tier 2 program, NYSERDA and Staff seek stakeholder input regarding NYPA's proposal to satisfy its own Tier 2 obligation through self-supply, acquisition of RECs, or alternatively, through another compliance mechanism.[78]

[78] Given that comments have already been received on the Tier 2 Petition, this White Paper seeks input on the discrete issue of NYPA's role in the Competitive Tier 2 program, as noted above.

II.c.5 Repowering

Under the 2018 Baseline Order, a repowered facility may be eligible for Tier 1, but only as an "upgrade" to an existing facility.[79] Under this existing approach, only incremental production is eligible for Tier 1. Incremental production from "upgrades" is calculated as the production that exceeds the facility's historic generation levels.[80]

This White Paper proposes that the Commission amend the requirements for repowered facilities to be eligible for Tier 1. The goal of this proposal is to ensure that existing facilities see the correct price signal for repowering, while avoiding any duplicative expenditure of ratepayer funds for facilities that have already received support and have yet to reach the end of their useful lives. For purposes of this proposal, the useful life of wind and solar facilities shall be deemed to be 20 years, and for hydroelectric facilities shall be 50 years.

This White Paper propose that for a repowering to qualify under Tier 1, the following conditions must be satisfied:

1. The project must be a qualifying technology and meet all other requirements of the Tier 1 solicitation.
2. Until the end of the facility's useful life, generation in excess of the facility's projected generation, rather than its historic production, will be eligible for Tier 1. Generation up to the projected amount may be eligible for Tier 2, but in any case must be delivered for end use to the NYCA. A third-party engineering report will be required to verify the projected generation through the Tier 1 certification process.

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[79] 2018 Baseline Order at 31.

[80] See Final Phase 1 Implementation Plan at 3 – 4.

Generation from the repowered project that occurs after the useful life of the existing facility would be fully Tier 1-eligible.

3. The repowering must include, replacement of each prime mover. Replacement of the prime mover must result in an overall increase of 15% or more in the production of the generation unit compared to its projected future output. For purposes of this requirement, "prime mover" shall be defined as follows: for wind facilities, the wind turbine, including the generator, gearbox (if any), nacelle, rotor and blades; for solar PV facilities, the modules and inverters; and for hydroelectric facilities, the generator, the entire turbine and structures supporting the turbine, but not the building housing the turbine.
4. The repowering must have the result that 80% of the tax basis per Generally Accepted Accounting Principles (GAAP) from the completed Repowered Facility (not including its property and tangible assets) is derived from capital expenditures made on or after the date of a Commission order implementing this proposal. Independent audit and verification will be required. Certification will be required and submitted at the time of the resource eligibility determination under Tier 1 of the RES.

The following example may help to illustrate: Fifteen years into commercial operation, a 100 MW wind facility replaces each prime mover. The repowering results in a 20% increase in the annual production of the facility, and satisfies the 80% tax basis requirement. For years 16 through 20, the production projected from the original 100 MW facility (which would be

projected to decline over time) may be eligible for Tier 2 but would not be eligible for Tier 1, while the incremental production would qualify under Tier 1. From year 21 on, the entire output of the repowered facility would be eligible for Tier 1.

Capital improvements to existing resources that increase production but that do not meet the above definition of "repowering" will continue to be eligible for Tier 1 as "upgrades." Under the proposal in this White Paper, NYSERDA will continue to treat upgrade applications as it currently does. The principal distinction between "upgrades" and "repowerings" is that for upgrades only the incremental production is *ever* Tier 1-eligible, whereas for repowerings the facility's entire production becomes Tier 1-eligible at the end of the initial useful life.

II.d LSE Obligations

The CES includes a Renewable Energy Standard (RES), a Zero-Emissions Credit (ZEC) requirement, and, as of July 12, 2018, an Offshore Wind Standard (OSWS). The ZEC requirement consists of an obligation that LSEs purchase ZECs from NYSERDA in proportion to their load served. The RES consists of an obligation on every LSE to serve their retail customers by procuring new renewable resources, evidenced by the procurement of qualifying Tier 1 RECs or by making Alternative Compliance Payments (ACPs). The LSE obligation approach under the OSWS is comparable to the one under the ZEC requirement.

The CES Framework Order acknowledged that additional measures would be necessary to fully implement the CES, to be addressed through a series of Commission actions in successive orders. Those additional measures were to be determined in an implementation phase. To date, NYSERDA and Staff have filed and executed four implementation plans; the Phase 4 Implementation Plan was filed April 16, 2020. In part, the various implementation plans have impacted LSEs and their obligations under the CES, such as NYSERDA's move to selling Tier 1 RECs through a quarterly sale process, and having LSEs make their ZEC payments to NYSERDA using a pay-as-you-go model.

i. LSE obligations to achieve 70 by 30 Target

LSEs play a key role in the "integrated statewide policy" to achieve the 70 by 30 Target. LSEs pass the cost of meeting their obligations onto their retail energy customers. The various LSE obligations as defined under the CES and the OSWS and refined through the implementation plan process have led to

a well-functioning market with a high degree of compliance.[81] This White Paper does not recommend any changes, in general, to the currently approved approaches regarding LSE obligations or the Phase 4 Implementation Plan filed with the Secretary.

NYSERDA and Staff have consulted with NYPA and LIPA in formulating this White Paper to ensure proper coordination and to identify a mechanism whereby NYPA and LIPA will provide annual updates on their progress towards meeting their respective shares of the Statewide CLCPA Targets. In addition, the annual report to NYSERDA will provide notice regarding the extent to which NYSERDA should adjust its CES procurements to reflect those shares.

To date, LIPA has procured solar and offshore wind resources through its own programs and RFPs to provide local reliability, environmental and economic benefits; though it has indicated an interest in participating in future NYSERDA procurements to achieve economies of scale. With respect to ZECs, LIPA has been participating in NYSERDA's program as a voluntary LSE.

While NYPA has signaled its intention to meet the renewable targets through independent efforts, unilateral action is not possible with respect to ZEC procurement as NYPA must contractually negotiate such purchases directly with its customers. NYPA continues to make progress in addressing the quantity of "uncollectible" load as those contracts are renegotiated. The current ZEC payment deficit is approximately $34 million and must eventually be resolved through some mechanism. The CES Order anticipated that deficits may occur over the life of the program and directed that NYSERDA would

[81] 2018 Progress Report at 21, 24.

seek to cure any such deficits through an IOU "backstop" mechanism.

Given the current situation, NYSERDA and DPS propose that the ZEC deficit be cured through the use of existing, uncommitted and unspent Energy Efficiency Portfolio Standard (EEPS)/Renewable Portfolio Standard (RPS)/Systems Benefit Charge (SBC) funds rather than through the backstop mechanism. Resorting to the backstop mechanism would necessitate new collections from ratepayers at this inopportune time, while use of the uncommitted and unspent EEPS/RPS/SBC funds would not impact customer bills.

Going forward, NYSERDA and DPS propose to exclude the "uncollectable" portion of load when determining the various LSE obligations. This reduction of load would be included when determining the total statewide load for the various obligations and reporting considerations. NYPA and LIPA have indicated that they will each provide an annual report to NYSERDA of their intentions to contribute to the ZEC program, at least six months prior to the start of any compliance year, which would allow NYSERDA to recalculate the obligations of the jurisdictional LSEs. NYPA and LIPA will also provide to NYSERDA an annual report on its independent progress in pursuit of the statewide goals for integration into NYSERDA's overall reporting requirements described herein.

ii. LSE Annual Tier 1 Compliance Targets

Tier 1 RES compliance targets obligate LSEs to procure a certain number of Tier 1 RECs each year. The annual compliance targets are set three years in advance on a rolling basis in the annual Divergence Tests, by reference to the expected level of available RECs throughout each three-year period.

This White Paper incorporates LSE compliance targets for the period to 2023, rather than using the Divergence Test as prescribed in the Final Phase 3 Implementation Plan.[82] This proposal is administratively more efficient because this White Paper encompasses similar topics such as future load forecasts and Tier 1 procurement results.

NYSERDA and Staff used a process for doing so consistent with the CES Framework Order and the Commission's November 2016 Clarification Order.[83] LSE percentage compliance obligation targets are derived based on (1) the sum of Tier 1 RECs expected to be generated in each year from projects under contract under RPS Main Tier solicitations conducted through 2016 plus expected Tier 1 RECs procured through RES solicitations by NYSERDA, as they become operational, plus those behind-the-meter RECs from new distributed renewable energy resources that are deemed eligible (facilities receiving Tier 1 RECs under the Value of Distributed Energy Resources),[84] divided by (2) the forecasted aggregate jurisdictional load. Forecasted load is based on the load forecast developed in the NYISO Gold Book, adjusted for projections of additional beneficial electrification and energy efficiency (beyond those contemplated by NYISO in its forecast).

Based on this analysis, this White Paper recommend that the mandated LSE Tier 1 REC obligations for 2021 through 2022 be revised. This revision is based on the fact that projects

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82 Case 15-E-0302, supra, Clean Energy Standard Final Phase 3 Implementation Plan at 15 (filed January 11, 2019).

83 Case 15-E-0302, supra, Order Providing Clarification (issued November 17, 2017).

84 Renewable facilities that receive compensation for the environmental component of the value stack in VDER (the "E-value"), are required to assign the RECs generated by such facilities to the interconnecting utility. The utility may use such RECs to satisfy the Tier 1 obligation.

awarded under the CES Tier 1 solicitations have been delayed in permitting and construction and that quantities of available RECs during these years are thus expected to be lower than was the case when the targets for these years were set originally. The proposed reduced LSE compliance targets for 2021 and 2022, as well as the target for 2023, are as set out in Table 4 below.

The expected project delays revealed by the most recent data, while also attributable in part to impacts of the current COVID-19 pandemic, stress the importance of addressing deployment barriers in particular related to siting procedures. It is anticipated that the Accelerated Renewables Act will provide significant relief and a reduction in the time necessary to permit and ultimately begin commercial operation of projects awarded under the Tier 1 solicitations.

Table 4
LSE Tier 1 Compliance Obligations]

	Current LSE Tier 1 Obligation	**Proposed LSE Tier 1 Obligation**
2020	2.84%	
2021	4.20%	2.04%
2022	8.40%	5.61%
2023		8.20%

II.e Administrative Funding

i. Background

The Commission designated NYSERDA as the administrator of both the RES and ZEC programs in the 2016 CES Order. Each year NYSERDA files a Petition seeking to recover the funds necessary to cover its costs for the Compliance Period. In July 2019, NYSERDA filed a Petition for Compliance Year 2020. The Commission approved NYSERDA's Petition, with modifications, on November 14, 2019.[85] That Order approved the use of existing unspent, 2018 compliance period funds, System Benefits Charge (SBC), Energy Efficiency Portfolio Standard (EEPS), and Renewable Portfolio Standard (RPS) funds for Compliance Year 2020 12-months administrative costs for both the RES program beginning on January 1, 2020, and the ZEC program beginning on April 1, 2020.[86]

NYSERDA was initially authorized to expend up to $9,797,000 for the OSWS[87] associated with the administration and development costs of the offshore wind platforms and systems. This funding allowed NYSERDA to continue the work begun under the original $15 million in offshore wind-related funding authorized under two Clean Energy Fund investment plans that was used to fund the Offshore Wind Master Plan and other pre-development activities. In April 2020, NYSERDA was further authorized to expend up to an additional $4,414,461 to cover administrative costs from July 2020 through December 2020, related to an additional 2020

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85 Case 15-E-0302, supra, Order Approving 2020 Clean Energy Standard Administrative Budget (issued November 14, 2019).

86 The CES Order established the RES compliance period as January 1 to December 31 of each year and the ZEC compliance period as April 1 to March 31 of each year, beginning in 2017.

87 Phase 1 Order at 63.

offshore wind procurement, using existing unspent RPS funds to cover these incremental administrative costs.[88] The 2020 Offshore Wind Order required that administrative costs for January 2021 and beyond shall be built into a revised Clean Energy Standard and Offshore Wind Standard comprehensive budget.

This White Paper proposes that the administrative funding for all programs be combined into one comprehensive annual funding request. Under this proposal, NYSERDA would identify and quantify the funds to be used to cover NYSERDA's costs and fees to administer the RES, ZEC, and OREC programs for each calendar year. NYSERDA would also include the Competitive Tier 2 and Tier 4 programs in this CES budget, if adopted.

NYSERDA anticipates having an adequate quantity of Tier 1 RECs, ZECs, and Tier 2 RECs (if adopted) available for sale in 2021 and therefore proposes to fund its administration through an adder mechanism for these programs beginning in 2021, through which its administrative costs for the respective program(s) would be allocated across the attributes NYSERDA sells to LSEs in each year, via a commensurately-increased attribute price or an increased LSE rate, depending on the approach taken to attribute disposition, as described below. The respective adders would reflect the approved administrative costs for 12 months, shortfall or surplus from previous years and would be reduced by any revenues received in the previous years including bid fees, alternative compliance payments received, and interest income.

The 2021 administrative funds for the RES Program would be applied to the Tier 1 REC price in the 2021 RES compliance period beginning on January 1, 2021 through December 31, 2021.

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[88] 2020 Offshore Wind Order at 32.

As proposed in the Phase 4 Implementation Plan, if adopted, NYSERDA would inform LSEs of the price and quantity of the Tier 1 RECs plus any Commission-approved adder at the start of each quarterly sale.[89]

The 2021 administrative costs for the ZEC Program and shortfall for Year 3 (2019) outlined below would be applied to the 2021 ZEC compliance period beginning on April 1, 2021 through March 31, 2022.[90] As described in the ZEC Implementation Plan, NYSERDA would notify LSEs of the ZEC rate plus any Commission-approved adder at least 2 months before the commencement of a compliance year.[91]

For the competitive Tier 2 Program, if adopted, the 2021 administrative costs would be applied to the uniform Tier 2 rate for the 2021 compliance period. NYSERDA would publish on its website a Tier 2 rate plus any Commission-approved administrative adder for the applicable compliance period.

Given that offshore wind and Tier 4, if adopted, are not anticipated to produce attributes to sell in 2021, NYSERDA proposes to continue to utilize SBC, EEPS, and RPS uncommitted balances to cover administrative costs for the offshore wind program and Tier 4, if adopted.

As has been the case historically, NYSERDA will continue to file quarterly itemized reports on costs associated with the administration and the development of the programs, and will reconcile actual expenses with approved funding and collections and apply any differences to subsequent year collection amounts.

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89 Case 15-E-0302, supra, Clean Energy Standard Phase 4 Implementation Plan Proposal (filed April 16, 2020).

90 The CES Order established the ZEC compliance period as April 1 through March 31 of each year.

91 Case 15-E-0302, supra, Clean Energy Standard Final Zero Emissions Credit Implementation Plan (filed October 21, 2019).

The Commission specifically addressed the financial risk of the programs by providing that the EDCs could be authorized by a Commission Order to collect financial "backstop" collections for the REC, ZEC, and offshore wind programs. This White Paper proposes the Commission clarify that the backstop mechanism be provided for all programs under the CES based on the principles already approved by the Commission.[92]

ii. Reconciliation of Administration

NYSERDA has filed quarterly itemized reports on costs associated with the administration and the development of the RES and ZEC and offshore wind programs.[93] As is illustrated by Table 1, NYSERDA is projecting an overall shortfall in funding for Administrative Funds for the 2019 RES compliance year ending December 31, 2019 and the ZEC compliance year ending March 31, 2020. The variances in salary and overhead costs relate principally to differences between assumed and actual salary allocations, and the difference in NYS Costs Recovery Fee Expenses relate to differences between the program's proportionate share of expenses and those that were anticipated. As proposed above, the specific program administrative budget differences will be included in the amounts set for either the REC adder charges for 2021 compliance year ending December 31,

92 Case 15-E-0302, supra, Order Approving Administrative Cost Recovery, Standardized Agreements and Backstop Principles (Issued November 17, 2016).

93 Available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={3E917DFE-E96F-4684-9ECF-CDC84A5D1C77}, and http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={84C16545-FF44-4B9A-ABAE-7A45293F6851}.

2021 or ZEC adder charges for the 2021 compliance year ending March 31, 2022.

RES and ZECR Compliance Year Three Reconciliation			
Program Salary, Overhead and Cost Recovery Fee Expenses	**Year 3 Budget**	**End of Year 3 Committed**	**Unspent Funds**
RES Salary and Overhead	$1,820,389	$1,965,416	-$145,027
RES NYS Cost Recovery Fee Expenses	$142,284	$102,919	$39,365
ZECR Salary and Overheard	$390,025	$527,887	-$137,862
ZECR NYS Cost Recovery Fee Expenses	$4,349,499	$6,885,604	-$2,536,105
RES/ZEC Technical Support	$1,475,000	$1,400,081	$74,919
RES System Development	$425,000	$278,637	$146,363
Total	**$8,602,197**	**$11,160,544**	**-$2,558,347**

iii. 2021 Administration

NYSERDA's administrative budgets typically include NYSERDA staff direct and indirect salaries, fringe benefits, and other direct program operating costs and allocated general and administrative expenses as well as technical support for program and system development.

As described in Sections II.c.1 and II.c.2 above, the procurement volumes that must be achieved through the CES for RECs will increase substantially and require significant new efforts over a series of years to advance its timely and responsible achievement. NYSERDA is taking an even more active role in contributing to planning and project development processes for awarded projects with the aim to bring forth projects that are both cost-effective and responsibly developed. The resounding success of the previous solicitations and New York's significantly expanding large scale renewable market results in the need for NYSERDA to allocate an additional 1.5 FTE across the CES programs toward activities involving procurement, contact negotiations, contract management and

analysis as well as other related market development activities such as the administration of NYGATS.

Should the Commission adopt the Tier 4 proposal in this White Paper, NYSERDA would seek to cover the costs and fees it would incur in developing and administering the Tier 4 program. Those costs would be expected to begin in 2020 and continue through 2021, with the issuance of a Tier 4 RFP. The Tier 4 program would also require System Development funding for the issuance of RFPs and anticipated revisions to NYGATS and other systems as well as Technical Support for program design and review of proposals. Administration of the Tier 4 program would require an additional 1.25 FTE staff. Activities of this staff would be to issue at least one RFP, determine eligibility and actively manage any contract(s) resulting from the solicitation(s). Contract Management includes settlement and invoicing of contracts. In addition, staff would need to develop processes to collect and reconcile the LSE compliance obligations for Tier 4 RECs and integrate various financial, compliance and progress report activities into existing reports. NYSERDA would streamline and integrate existing business process in the most cost-effective manner.

As described in Section II.c.4 of this White Paper, NYSERDA requested authority to create a Competitive Tier 2 Program. Should the Petition be adopted by the Commission, NYSERDA seeks approval for the costs of the program, with the issuance of the first Competitive Tier 2 solicitation expected in 2021.[94] In the initial filing, NYSERDA included a proposal regarding NYSERDA's administration of the Competitive Tier 2 program for the period beginning in 2020 and through the reconciliation process in 2026. This White Paper proposes to modify that proposal to

request administrative funding associated with the administration and development of the program beginning in 2020 and through 2021, consistent with the other programs described herein.

Categories include "Technical Support" and "System Development." Technical Support includes costs associated with the on-going program consultant support and implementation for the CES programs; development and issuance of procurements and technical evaluation panels for proposal submission review. Further, this White Paper has proposed that the Commission provide $1,000,000 to support the execution of a Great Lakes Wind Feasibility Study, which is included in the Technical Support for the OREC program below. System Development includes costs for the administration, operation, and on-going maintenance of the Program databases and NYGATS. NYSERDA has a five-year agreement for the administration, operation and maintenance of NYGATS that is up for renewal in early 2021. NYSERDA will seek to renew the service contract for the operation, maintenance, and administration of NYGATS in 2021.

NYSERDA will allocate a proportionate share of the annual New York State Cost Recovery Fee (CRF) to the CES program. The CRF is a fee assessed to NYSERDA and other public authorities by New York State for an allocable share of state governmental costs attributable to the provision of services to public benefit corporations pursuant to Section 2975 of the Public Authorities Law. For the past four fiscal years, the CRF assessment has averaged about 1.18% of NYSERDA's annual expenses. NYSERDA has assumed an allocation of just under 50% of that amount to CES program costs.

Table 5 summarizes the anticipated calendar year 2021 administrative expenses across all existing and proposed programs.

Table 5
Anticipated 2021 Administrative Expenses

2021						
Program Salary, Overhead and Cost Recovery Fee Expenses	**RES**	**ZECR**	**OREC**	**Tier 2**	**Tier 4**	**Totals**
Salaries and Overhead	$4,495,607	$492,945	$2,806,800	$406,972	$406,972	$8,609,295
NYS Cost Recovery Expense	$632,473	$6,400,492	$102,799	$407,222	$18,962	$7,561,948
Technical Support	$3,175,000	$225,000	$5,685,000	$500,000	$900,000	$10,485,000
System Development	$340,000	$660,000	$220,000	$270,000	$300,000	$1,790,000
Total	$8,643,080	$7,778,436	$8,814,599	$1,584,193	$1,625,934	$28,446,243
Total FTE	14.80	1.35	8.60	1.25	1.25	27.25

II.f Reporting

Given the experience administering the CES program to date, including implementation of the reporting requirements, this White Paper proposes the adoption of the revised programmatic reporting schedule set forth in Table 6 below that combines and streamlines CES program reporting requirements and includes the new Tier 4 program, if adopted. In addition to the CES reporting requirements, LSEs are required to submit a report in NYGATS documenting their annual Tier 1 RES compliance activities. Table 6 below reflects the recommendation in Section II.c.1 of this White Paper that NYSERDA no longer publish Triennial Reviews after 2020.

Table 6
CES Reporting Requirements

Item	Type	Public	Frequency	Due Date	Purpose/ Implications
Open NY Reporting	Report	Yes	Quarterly		Indicates procurement results, contract status, potential supply of RECs and status of contracted baseline renewables
CES Financial Status Report	Report	Yes	Annual	Last Business day of March	ACP Disposition
Annual RES Compliance Report	Report	No	Annual	Last Business day of September	Summary data on how LSEs met Tier 1 obligation
Annual CES Compliance Report	Report	No	Annual	Last Business day of September	Summary data on how LSEs met OREC, Tier 2, Tier 4 obligations
Annual ZEC Compliance Report	Report	No	Annual	Last Business day of October	Summary data on how LSEs met ZEC obligation
Tier 1 REC and ACP Prices for upcoming CY	Filing, Other	Yes	Annual	Last Business day of December	Set Tier 1 REC price by vintage
CES Progress Report	Report	Yes	Annual	Last Business day of January	Progress towards overall 70 by 30 goal

Item	Type	Public	Frequency	Due Date	Purpose/ Implications
Divergence Test and Target Setting	Petition	Yes	Annual	Last Business day of September	Assess supply-demand balance; Set next year for LSE obligations and targets
Build-Ready Report	Report	Yes	Annual	First Business Day of April	
NYSERDA Administrative Funds (quarterly)	Report	Yes	Quarterly	Due 45 Days after end of each quarter	
CES Administrative Funding Petition	Petition	Yes	Annual	Last Business day of July	
CES Biennial Program Review	Petition	Yes	Biennial	No later than July 1, 2024	Comprehensive review of the program