Department of Public Service

STAFF WHITE PAPER ON CLEAN ENERGY STANDARD

CASE 15-E-0302

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I. INTRODUCTION, OBJECTIVES, AND SUMMARY OF PROPOSAL

A. Introduction

The 2015 State Energy Plan (SEP) states that 50 percent of all electricity used in New York State by 2030 should be generated from renewable energy sources (the 50 by 30 goal).[1] The SEP goal for electricity is in the context of some of the nation's most ambitious clean energy targets: 40% reduction in greenhouse gas emissions from 1990 levels by 2030; 50% of electricity generation coming from renewable energy resources; and 600 trillion Btu in energy efficiency gains, which equates to a 23% reduction from 2012 in energy consumption in buildings. These targets put the State on a path to achieve its longer-term goal of decreasing carbon emissions 80% by 2050.

By letter of December 2, 2015, Governor Andrew Cuomo directed the Department of Public Service (DPS) to develop a Clean Energy Standard (CES) that converts the SEP targets to mandated requirements that will ensure their achievement, and present the program to the Commission at its June 2016 session. On January 21, 2016, the Commission expanded the scope of the ongoing large-scale renewables (LSR) proceeding to encompass the CES. The Commission ordered Staff to develop a white paper on CES and set forth a process designed to allow for Commission consideration of a CES at the June 2016 session.[2]

The aggressive 50 by 30 goal requires concerted action across a range of issues. In considering the design of the CES, a number of competing interests are encountered, which are resolved in a

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[1] The Energy to Lead, 2015 New York State Energy Plan, p. 112.

[2] Case 15-E-0302, In the Matter of the Implementation of a Large Scale Renewable Program, Order Expanding Scope of Proceeding and Seeking Comments, issued January 21, 2016.

manner consistent with the Commission's policies and with the paramount concern of maintaining customer interests.

B. Objectives

This White Paper addresses four principal policy objectives of the CES:

1. *Increase renewable electricity supply to achieve the 50 by 30 goal.* The SEP includes some of the nation's most ambitious clean energy targets for 2030: 40% reduction in greenhouse gas emissions from 1990 levels; 50% of electricity generation coming from renewable energy resources; and 600 trillion Btu in energy efficiency gains, which equates to a 23% reduction from 2012 in energy consumption in buildings. These targets put the State on a path to achieve its longer-term goal of decreasing carbon emissions 80% by 2050.

2. *Support construction of new renewable generation in New York State.* Clean and renewable energy sources are not only required to reduce carbon emissions; they represent the future of the electric industry and should be a critical component of economic development strategy. As the Commission has explained in its Reforming the Energy Vision (REV) Framework Order, a modern electric system will integrate clean generation at the bulk level with distributed generation and dynamic load management at the customer level.[3] Economic benefits will come from new construction and maintenance jobs as well as from optimizing system efficiency.

3. *Prevent premature closure of upstate nuclear facilities.* In his instructions to DPS, the Governor stressed the importance of ensuring that emission-free sources of electricity

[3] Case 14-M-0101, Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision, Order Adopting Regulatory Policy Framework and Implementation Plan (issued February 26, 2015).

remain operational: "Specifically, elimination of upstate nuclear facilities, operating under valid federal licenses, would eviscerate the emission reductions achieved through the State's renewable energy programs, diminish fuel diversity, increase price volatility, and financially harm host communities." He noted that support of these carbon-free resources should be separate and distinct from the renewable energy 50 by 30 goal.

4. *Promote the progress of REV market objectives.* In the Clean Energy Fund order (CEF Order), the Commission noted that the first pillar of industry transformation is the articulation of clear and ambitious targets.[4] REV and the CES will promote each other's achievement. REV will not only cause an expansion of distributed resources but also will enable their integration with bulk systems in a way that decreases system costs and facilitates renewable generation. The CES, by clearly stating both an absolute mandate and interim targets, will support the development of a vibrant clean energy market and provide the scale and certainty necessary for broad competition that encourages private investment and reduces costs.

The White Paper incorporates the Commission's policies to ensure that all initiatives are designed to achieve REV's basic principle of a consumer-oriented market that encourages innovative, market-based solutions that reduce costs while meeting critical environmental needs. Specifically, the CES program features that Staff recommends are designed to meet the outcome objectives articulated in the CEF Order in the following ways:

1. **Manage Energy Costs** - The CES program approach will promote cost-effective renewable energy development and acquisition

[4] Case 14-M-0094, Proceeding on Motion of the Commission to Consider a Clean Energy Fund, Order Authorizing the Clean Energy Fund Framework, issued January 21, 2016.

through multiple aspects of its design including the application of competitive procurement, long-term certainty and compliance flexibility.

2. **Protect Consumers and Ensure No Consumer Class Is Left Behind** - The CES program will include rigorous tracking and certification processes and promote solutions that enable all consumers to participate in affordable clean energy solutions to achieve the renewable goal.

3. **Promote Capital and Operating Efficiencies** - The CES program will create competitive markets with capital deployed by third parties, both on the wholesale grid and behind-the-meter. This will be necessary to achieve capital and operating efficiencies throughout the electric system. These qualities are the hallmarks of and the essential elements for a well-designed competitive market.

4. **Drive Business Model and Service Innovation** - The CES program will encourage promotion of new market models that encourage and incent individual consumers to accelerate and exceed the State's goals and support innovation throughout the sector.

5. **Assure timely and Appropriate Investment in Infrastructure and Grid Modernization** - The CES program will be designed to appropriately integrate new generation supply in strategic locations that will ensure that the system remains reliable, secure and cost effective.

6. **Achieve Greenhouse Gas Reductions** - A fundamental goal of the CES program, as articulated in the SEP and all regulatory REV-initiated actions, is to reduce harmful Greenhouse Gas (GHG) emissions in response to the risk of climate change.

B. Summary of the Proposal

A number of options are available as New York State looks to evolve from its past unique approach of supporting Large Scale Renewables (LSR) through the Main Tier of the Renewable Portfolio Standard (RPS) program. This White Paper provides a foundation for policy and program design considerations and recommendations for New York's future approach to support LSR as well as behind-the-meter renewable resources.

In preparing this White Paper, Staff consulted best practices of renewable standard programs across the country, with an emphasis on neighboring states that will have a strong effect on New York markets for renewable resources.[5]

The White Paper also addresses the current wholesale electricity market conditions affecting the fleet of upstate nuclear facilities and provides recommendations for keeping these emission-free plants in operation to ensure the State does not backslide on its efforts to meet its ambitious GHG emission reduction goals.

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[5] See The State/Federal RPS Collaborative, "Recommended Principles and Best Practices for State Renewable Portfolio Standards," January 2009; Grace C. Robert, Donovan A. Deborah, and Melnick L. Leah, "*When Renewable Energy Policy Objectives Conflict: A Guide for Policymakers,*" National Regulatory Research Institute and Sustainable Energy Advantage, LLC, October 2011, Progress Report; Warren Leon, "*The State of State Renewable Portfolio Standards,*" Clean Energy States Alliance, June 2013, Progress Report (Prepared for the State-Federal RPS Collaborative); Warren Leon, "*Designing the Right RPS: A Guide to Selecting Goals and Program Options for a Renewable Portfolio Standard,*" Clean Energy States Alliance, and National Association of Regulatory Utility Commissioners, March 2012, Progress Report (Prepared for the State-Federal RPS Collaborative and NARUC).

The White Paper also provides a discussion of the need for more detailed program implementation prior to the CES launch in 2017, and party participation in developing schedules for program targets. Estimated program costs will be provided in a supplemental filing by Staff, to be issued well in advance of due dates for party comment.

In consideration of the above, Staff recommends that the Commission establish the following elements for the CES design framework:

- All electric retail load serving entities (LSEs) share the obligation of the CES mandate in proportion to their annual retail electricity sales. This includes 'jurisdictional' LSEs, subject to the Commission's authority and all 'non-jurisdictional' LSEs (the New York Power Authority, or NYPA, and the Long Island Power Authority, or LIPA);
- Establishment of CES tiers to support a growing quantity of new renewable generation, as well as continued contribution of existing renewables and zero emission resources;
- Specification of eligibility requirements for resources within each tier (Resource type, Vintage, Geographic, Other);
- For each tier, a firm set of requirements through 2020, with targets through 2030 to be developed in an implementation plan;
- Demonstration of compliance through the use of tradable renewable energy credits (RECs) for renewable energy purchases, and zero emission credits (ZECs) for qualified nuclear generation purchases, both as created and tracked within a newly designed New York Generation Attribute Tracking System (NYGATS);

- Use of an alternative compliance payment mechanism for each CES tier to cap REC and ZEC prices and provide for a flexible alternative means of compliance;
- Competitive long-term procurements by NYSERDA and utilities, as needed, for specific tiers to support project financing, reduce compliance costs, and provide both generators and customers with price stability;
- A method for disposition of procured RECs and ZECs;
- Triennial program assessments by the Commission; and
- Development of an Implementation Plan.

II. DISCUSSION AND PROPOSALS

A. Renewable Energy

1. 50 by 30 Goal, Obligation, and Compliance Mechanism Calculating the 50 by 30 Mandate

As discussed, the Governor has directed the Department to develop a plan to achieve the SEP 50 by 30 goal. Staff has initially determined that in order for this goal to be met, slightly more than 33,700 GWh of incremental renewable generation must be added to the State's fuel mix.

Staff arrived at this calculation by determining projected 2030 load statewide. Staff adjusted the projected load growth for expected energy efficiency gains. We then noted that in 2014 the State had approximately 26% renewable energy in its power generation mix, net of exports, or 41,300 GWh of renewable energy. We then calculated that the CES program will be required to add an additional 33,700 GWh of renewable energy to meet the 50% by 2030 mandate.

The details of this calculation, including the amount of renewable energy currently consumed within the State and the method

for forecasting load (inclusive of projected energy efficiency achievements), are provided in Appendix B.

Incremental Renewable Energy Needed to Reach the 50% by 2030 Goal

As described in Appendix A, Staff developed a load forecast in order to determine the level of total renewable generation required in 2030. To ensure that progress towards the 50 by 30 mandate is being accomplished, Staff proposes that triennial reviews be established so that the program can be adjusted as needed and all market participants have certainty on program goal and target levels. This certainty will help provide stability in market demand for project developers. Within the framework of triennial reviews and updates, annual targets will be developed and included in the Implementation Plan addressed later in the White Paper.

Staff recommends that the Commission establish the first goal for 2017, the expected first year of the CES. Subsequent triennial goals are recommended for 2020, 2023, 2026 and 2029. The standard will conclude with achievement of the 2030 goal. At this time, only the 2017 and 2020 goals will be set. Each incremental triennial goal will be established well in advance of the end-date of the previous goal to provide continuity and visibility for market participants. Staff recommends against establishing interim targets between 2020 and 2030 at this time. Rather, Staff recommends that the Commission establish a process whereby the next interim target will be set some time before 2020. This will give the Commission a better opportunity to establish a trajectory based on the experience of the markets and, at the same time, do so in sufficient time to avoid market uncertainty. The overall trajectory for achieving the 2030 goal will be the subject of further comment and party participation.

Triennial Renewable Energy Goals

The following table depicts the first two triennial statewide renewable energy goals, as well as the 50 by 30 Goals.

Statewide Triennial Renewable Energy Goals

Year	Statewide Energy Need after Energy Efficiency (GWh)	Renewable Energy (GWh)	Percent of Load that is Renewable
2017	159,894	42,832	26.8%
2020	158,597	46,761	29.5%
2030	150,017	75,008	50.0%

The Role of Energy Efficiency

The load forecast, developed to determine the incremental renewable generation required to meet the 2030 goal, reflects specific targets for the deployment of energy efficiency derived from the SEP. In addition to its impact on the baseline, energy efficiency will play an important role in compliance, because LSEs that can assist their customers in reducing usage will thereby reduce the overall load for which the LSE must demonstrate compliance.

In its energy efficiency Orders, the Commission makes clear that programs developed through these policy frameworks have an overall objective to drive delivery of energy efficiency and other distributed energy resources at scale to help achieve the 50 by 30 mandate along with other REV-driven clean energy policies. The Commission, in the CEF Order, has called for the creation of a Clean Energy Advisory Council (CEAC), co-chaired by DPS Staff and NYSERDA. The CEAC has among its primary objectives developing recommendations as to how the CEF and CES initiate activities leading to and supporting a sustainable market for procuring energy

efficiency as a demand reducing resource. Staff anticipates that as part of this inquiry the CEAC will explore multiple alternatives, including consideration of whether there should be a separate Tier or carve-in approach for energy efficiency in the CES or a distinct or compatible market. As noted in the CEF order, this proposal is due to the Commission by December 2016.

The Obligation on Load Serving Entities

The proposed CES will have a structure similar to RPS mandates in other competitive electric market states throughout the northeast. All LSEs will be responsible for compliance. Specifically, the obligation to comply will encompass all LSEs serving retail load in electric distribution company (EDC) territory, including all investor-owned EDCs (serving in their role as electric commodity supply service supplier of last resort), jurisdictional municipal utilities, and all competitive energy service companies (ESCOs). For each CES tier, each LSE will be responsible for supplying a defined percentage of retail load with supply derived from eligible resources during each calendar year (Compliance Year).

Although there are numerous alternative approaches to structuring a renewable energy standard,[6] this approach is consistent with the RPS market structures in neighboring states and aligns with the best practices in those states. Consistency with neighboring states will help developers to participate efficiently in multiple jurisdictions and will enable trading to reduce overall program costs, as discussed below.

The LSE mandate approach serves several important policy goals. It places compliance costs primarily in the generation supply charges where they are most appropriately applied. Since

[6] See note 5, above.

emissions result from generation, emission reductions can best be achieved when their cost is reflected in energy prices. The LSE requirement reduces the need for charges on the delivery bill, while assuring that progress towards meeting targets is not constrained by the availability of CEF funding or previously designated collections of distribution charge dollars. This approach promotes equity by requiring all users of energy to bear costs and participate in solutions. The benefits of the CES will accrue to all energy customers and the public at large.

The LSE obligation also promotes the REV objective of developing markets at the distribution level, as it encourages ESCOs to develop innovative products to reduce customer costs. An LSE obligation in tandem with a REC-based compliance mechanism, discussed below, increases market liquidity, with multiple buyers for RECs and ZECs enabling regular opportunities for generators to seek REC revenue, and promoting new and innovative retail products. With alternative mechanisms available to comply, LSEs will have significant flexibility to optimize their business strategies.

Each LSE will be required to meet its CES obligation for each tier[7] within each Compliance Year. For each LSE, each tier's CES obligation would be determined by multiplying the LSEs load obligation by the percentage CES target for that year. Calculation of the load obligation would be measured at the wholesale level (i.e., retail metered load as grossed up to reflect aggregate delivery losses on the system, the energy obligation as measured by the New York State Independent System Operator) so as to be measured on a comparable basis to the quantities generated.[8]

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[7] For a discussion of tiers, see below.

[8] Otherwise, if measured at retail, since creation of RECs is measured at the generator busbar, it would take less than 50% of energy in the system to provide RECs equaling 50% of the total load obligation.

Existing State-controlled renewable generation (i.e., New York Power Authority hydropower) will be included in the baseline and thereby will reduce the total obligation on all other LSEs.

Retail load is also served by NYPA, LIPA, and New York's rural electric cooperatives and municipal electric corporations who are supplied entirely by NYPA. These non-jurisdictional entities are expected to adopt renewable and non-emitting energy percentages for their served load and Staff will confer with NYPA and LIPA regarding their plans.[9]

Direct customers of the New York Independent System Operator (NYISO) purchase power directly from the NYISO and are customers of the distribution system, but generally not of an LSE. Because the CES obligation is primarily recovered through LSE commodity charges, and not delivery rates, direct NYISO customers will be treated as comparable to LSEs and must make compliance showing fulfillment of the REC obligation or the Alternative Compliance Mechanism (ACM).

A principal challenge of the LSE approach is that long-term contracts will be needed to facilitate the financing of new renewable construction, while LSEs lack the certainty of long-term load commitments in New York's competitive retail markets. Exposure to customer migration risk is a strong disincentive for LSEs to enter long-term commitments. This will be particularly challenging for many ESCOs who will be reluctant or unable to enter into long-term contracts. Staff recognizes that long-term contracting will be necessary to enable a sufficient level of development of certain new renewable generation; for that reason, program options are presented below that will allow long-term contracts for generation developers to be converted into shorter-

[9] See discussion of compliance mechanisms, below.

term offerings for non-utility LSEs, thus enabling all LSEs to comply with the mandate.

Certain types of market developments and program initiatives will have the effect of reducing total carbon emissions while increasing electricity demand. These include electric vehicles and geothermal heat pumps. If the adoption of these technologies has the effect of increasing the compliance obligation under the CES, then the CES could potentially have the inadvertent effect of deterring the adoption of beneficial technologies. Parties are encouraged to comment on the treatment of electric vehicles and geothermal heat pump conversions under the CES obligation.

Compliance Mechanism

Renewable Energy Credits

LSE compliance will be accomplished via tradable RECs, to promote liquidity, transparency, ease of verification and administration, and the most efficient use of resources. One REC will be created for each CES-eligible MWh generated; this is the universal unit of measure in states with REC markets. The REC feature is essential for New York's market-based CES obligation to have compatibility across systems, policies (i.e., Environmental Disclosure Label Program) and markets. Generation owners will be able to certify projects for eligibility in multiple states to facilitate their access to the highest value markets.

LSEs may purchase tradable RECs or, if an LSE owned or controlled the RECs from eligible generation, at the LSEs option a portion could be self-supplied. RECs may be traded in spot markets and through longer-term transactions. Different CES tiers will have different supply-demand dynamics, so RECs for each tier will have their own market prices at any time. Prices incurred by LSEs will be effectively capped by an Alternative Compliance Payment (ACP) price (see below).

Each LSE will demonstrate compliance through an annual compliance filing. To achieve this, LSEs will be able to purchase RECs directly from generators, or through a myriad of intermediaries (NYSERDA, power marketers, brokers, traders, and aggregators) or even other LSEs as they manage their REC positions. There is a thriving bilateral (over-the-counter) REC market, with liquidity aided by a robust community of brokers, already actively trading in all RPS compliance markets in the northeast. In addition, futures contracts for some deep and actively traded state compliance market RECs (MA, CT, NJ, TX) are traded on the Intercontinental Exchange (ICE).

Alternative Compliance Mechanism

An ACM uses the remittance of Alternative Compliance Payments, at payment levels established in advance by the Commission, as an alternative means of demonstrating compliance by LSEs. An ACP is not a penalty for non-compliance. Rather, it is a discretionary alternative avenue to compliance for the LSE. The ACP also serves as a cost cap, because LSEs will have no need or incentive to incur costs higher than the ACP.

The ACM approach is used widely and successfully throughout competitive market states that use an LSE obligation model for RPS. When supply of RECs is short, LSEs will typically rely on the ACM, rather than paying a higher price for RECs. Also, experience in other states has shown that small ESCOs with limited load may find it more cost-effective to pay the ACP for low volumes of compliance obligation rather than bearing the administrative cost involved in procuring RECs.

The ACP levels will be established by the Commission based on forecasted REC prices, system needs, and other relevant factors. Changes to the ACP schedule should be reviewed periodically, but not more than once every 3-5 years, and changes should be moderate

in magnitude and graduated over time, to provide stability and investor confidence. Appendix C contains detailed recommendations for the method of establishing ACPs for different types of eligible resources. Staff seeks comment on a schedule for ACP and frequency of review.

Disposition of Alternative Compliance Payments

There are several options for the disposition of ACP payments collected by NYSERDA from LSEs. Other states using ACPs employ payment funds to serve any combination of the following purposes:

- Fund additional long-term contract procurements; and/or
- Be refunded to ratepayers to offset the cost impacts of shortage to ratepayers while maintaining beneficial market price signals;
- Fund activities and programs to facilitate renewable energy development or siting or financing;
- Provide a supplemental source of funds for targeting preferred or emerging technologies or deployment in preferred locations that would not otherwise result from the CES market.

Staff recommends that ACP payments should not be oriented toward research and development but rather should be directly applied to reducing the costs of in-state renewable development in furtherance of the 50 by 30 goal. NYSERDA can use the CEF programs to prioritize the use of these proceeds.

2. Eligibility and Tiers

The Commission will need to determine eligibility criteria for resources to meet the mandate. Eligibility criteria will need to include decisions on specific technologies; fuel feedstock; size; vintage (new or existing plants); location of generation and other policy considerations. Because the variety of potentially eligible resources reflect a wide range of circumstances, the Commission should also consider creating separate compliance tiers.

Theory of Tiers

In many states with RPS or CES programs, it is typical to establish distinct tiers to accomplish specific state policy objectives. Particularly in restructured RPS markets, such tiers have often been defined by either technology and/or vintage into growth tiers (designed with increasing targets over time to drive investment in incremental supply) and maintenance tiers (designed with stable targets to maintain economically viable operation and limit attrition of the state's existing renewable energy fleet). The establishment of tiers allows for distinguishing between different technologies or types of projects, and setting different targets for each.[10]

Characteristics such as vintage, size, emissions, and technology, along with overriding policy objectives will dictate whether a facility is eligible for a particular tier. In addition, states have increasingly adopted targeted sub-tiers, sometimes referred to as carve-outs or set-asides, to encourage specific target technologies or applications.[11] Such approaches have most often been applied to distributed generation or more specifically solar electric, but have also been used for offshore wind in New Jersey and Maryland.[12] The overriding objectives and considerations associated with the establishment of tiers include the following:

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[10] R. Wiser, K. Porter, and R. Grace, "Evaluating Experience with Renewables Portfolio Standards in the United States," Ernest Orlando Lawrence Berkeley National Laboratory, March 2004.

[11] Barbose, Weaver, Darghouth, "Tracking the Sun VII, A Historical Summary of the Installed Price of Photovoltaics in the United States from 1998 to 2013," September 2014.

[12] N.J. P.L. 2010, c. 57 (2010); Maryland Offshore Wind Energy Act (2013).

Targeted approaches. Different approaches and separate targets, designed to work within a state's specific circumstances, can be considered for supporting development of incremental renewables as well as supporting continued operation and/or contribution of already operating renewable energy generators. Providing this distinction is intended to result in lower cost to ratepayers than combining different resources or vintages in a single tier, where pricing necessary to attract RECs from supply that has other potential markets (subject to competition) would otherwise result in over-paying for supply that does not require such payments.

The establishment of tiers will allow the Commission to distinguish among different technologies or types of projects, and set different targets for each. To acknowledge that some of the technologies or types of projects will be more expensive than others, any cost control mechanisms, such as alternative compliance payments, can be set at different rates for the different technologies or types of projects.

Preserve existing clean energy generation. States may seek to protect existing clean energy generators, either because of the environmental benefits that those generators provide or because the power plants are perceived to be valuable local businesses that provide jobs and other economic benefits.

Preservation of flexibility. While program requirements and procedures are designed to drive the market towards continually increasing renewable energy generation, programs should be sufficiently flexible to allow LSEs to respond to changing market conditions or other matters outside of their control. Therefore, the Commission may deem it appropriate to provide LSEs tractability in meeting the CES by promoting broad applicability in the eligible renewable technologies that are chosen to meet the mandate within each established tier. Doing so enables the development of a

competitive renewable energy market, and also provides LSEs with the flexibility to construct their own business models and compliance portfolios.

Competition. Combining several categories of renewables in a single tier drives head-to-head competition among all eligible renewables, including both mature and emerging technologies.

Co-Incentive Programs. Staff recognizes that the State may want to provide support for particular technologies due to their ability to advance a public policy interest, such as economic development. One approach that some states have applied is the creation of set-asides or carve-ins for these technologies. Another approach is to create greater REC value for certain attributes.

In order to facilitate implementation, maximize liquidity and minimize REC costs, the tier obligation should be as broad as possible. To the degree that it is desired to support specific types of new generation, or further support generation in particular locations or technological configurations (such as offshore wind or co-located energy storage), targeted co-incentive programs may be applied. These could be programs supported by the Clean Energy Fund, including NY-Sun and the Green Bank, for example. Given the magnitude of potential off-shore wind development, additional policy support mechanisms may be required. For distributed energy resources (DER), the need for future co-incentives may be complemented, or superseded entirely, by the locational and temporal full valuation mechanism that is being developed in REV. Numerous examples of such support programs

within the context of a broad new renewable tier can be found throughout the region.[13]

Staff Proposal for Tiered Approach to Meet Annual Obligation

Specific to New York's CES, options for treatment of new generation as well as supporting continued operation and/or contribution of already operating renewable energy generators (including those currently under contract to NYSERDA, and the pre-restructuring fleet) will be designed to work within the CES guiding principles. In structuring tiers, program design will seek to balance the conflicting objectives of (i) minimizing complexity of compliance and administration by minimizing the number of tiers, while (ii) striving to meet specific State policy objectives at minimum cost, which necessitates a degree of differentiation between resources and vintage.

In keeping with the CES guiding principles, Staff recommends providing LSEs flexibility in meeting the mandate by promoting broad applicability in the eligible renewable technologies that are chosen to meet the mandate. Therefore, Staff recommends the incorporation of a limited number of tiers within the CES program. Staff proposes that Tier 1 be established for all new incremental renewable generation and Tier 2 for certain existing renewable generation, but subdivided into sub-tiers as described below to minimize ratepayer cost. A Tier 3 will be designated to maintain existing eligible nuclear facilities. The use of these three tiers will allow for clear connectivity among CES program elements and desired outcomes.

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[13] Examples include Connecticut's ZREC, LREC and SHREC programs; a suite of incentive programs offered by the Massachusetts Clean Energy Center to targeted eligible resources; Rhode Island's Renewable Energy Growth program; and Maine's Community Renewable Energy Pilot Program, to name a few.

Geographic Eligibility

Adopting a 50 by 30 renewable requirement requires consideration of the eligibility of out-of-state energy facilities. Until 2013, out-of-state facilities were eligible with hourly scheduling and delivery requirements, similar to those in place in other regional markets. Adopting such an eligibility provision would expand supply options and provide enhanced competition leading to reduced compliance costs (relative to in-state-only eligibility) for the CES. However, these benefits could come with the possibility of reduced direct economic growth of the New York's renewable energy industry.

Drawing upon collective U.S. experience and best practices with RPS implementation, along with New York's previous approach to geographic eligibility for its RPS, Staff recommends that geographic eligibility and associated delivery requirements be instituted in a manner whereby renewable generation located in control areas adjacent to the NYISO control area will be eligible so long as the generation is accompanied with documentation of a contract path between the generator and the purchaser that, among other things, includes provision of transmission or transmission rights for delivering the generation via the NYISO. The deliverability requirement best ensures that the resource has the ability to provide supply to the New York consumption point. To count towards the CES goal, it is important that the eligible resource is one that can actually physically supply into the New York market.

Including more eligible resources can only serve to reduce the compliance cost for LSEs and, thus, impacts on consumers. Although this design element may have the result of reducing the construction of in-state resources, that impact should be mitigated by the other complementary programs the State has adopted or will

adopt, including NY-Sun and other co-incentive programs funded through the CEF.

Allowing deliverable out-of-state resources to participate is also consistent with the Commerce Clause of the Constitution. As CES is proposed to be a requirement on all LSEs, restricting these entities to in-state resources could invoke Commerce Clause concerns. The deliverability requirement, however, is consistent with both the goal of reducing State GHG emissions and the Commerce Clause.[14]

Tier 1 - New Renewable Resources

Tier 1 will be dedicated to new eligible energy facilities, beginning commercial operations on or after January 1, 2015, with targets that will escalate over time in order to advance the total to 50% by 2030. The technology and fuel feedstock eligibility will largely mirror that of the current RPS Main Tier program.[15]

Tier 1 is proposed to include no sub tiers or other limitations on facility size such that a wide range of system capacities and configurations are eligible to participate. The availability of co-incentives such as NY-Sun supports the recommended approach of not having Tier 1 sub-tiers. Eligibility of distributed generation within Tier 1 is without prejudice to the various ongoing proceedings to consider the future of net metering.[16]

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[14] Case 03-E-0188, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, Order Regarding Renewable Retail Portfolio Standard (issued September 24, 2004), pp. 58-64.

[15] See Appendix C.

[16] Case 15-E-0751, In the Matter of the Value of Distributed Energy Resources.

Tier 2 - Existing Renewable Resources

Staff proposes the establishment of Tier 2 to support the substantial fleet of non-State owned or contracted renewable energy generators already in operation and available to meet New York's CES targets from within New York or adjacent control areas. To support continued contribution of these resources toward meeting the CES targets, Tier 2 is proposed as an existing renewables tier, with overall targets that are stable over time, and designed to support continued contribution of operating resources. Tier 2 will be divided into two sub-tiers, Tier 2A and Tier 2B, described further below. Tier 2 is distinct from Tier 1 as it is designed to support operating renewable energy facilities, which do not need the same level of support to attract financing to build new generation facilities. Resources and technologies listed in Appendix B will be eligible for Tier 2 as long as plant operations begin before January 1, 2015 and specific sub-tier 2A or 2B eligibility criteria is met.

Since the cost structures, alternative revenue opportunities, and ownership of the existing fleet of renewables serving New York varies significantly, it is important to distinguish these projects from each other. The existing renewables fleet consists of four main categories: (1) projects from which New York State controls some or all of the RECs by virtue of ownership or contractual rights, (2) projects for which RECs are not controlled by New York State and that have alternative markets for their RECs with material revenue opportunities, (3) projects for which RECs are not controlled by New York State which have limited alternative markets for their RECs and whose RECs have limited demand and market value, and (4) imports of renewables located outside of New York.

Staff proposes that Tier 2 be subdivided into sub tiers, described below as Tier 2A and Tier 2B, to account for market dynamics; opportunity costs/alternatives and market values; and REC

ownership. Subdividing this tier is intended to result in lower cost to ratepayers than combining all of these resources in a single tier, where pricing necessary to attract RECs from supply that has other potential markets (subject to competition) would otherwise result in over-paying for supply that does not require such payments.

Tier 2A: Competitive Sub-Tier

This sub-tier is intended to provide sufficient revenue to attract supply for which New York must compete with other states, and may be critical to keeping all or most of the supply rolling off NYSERDA Main Tier projects from seeking higher revenues for provision of RECs in neighboring markets.

Tier 2A Eligibility

Staff proposes that eligibility for this tier would include the following subsets of resources described above:

- RECs from merchant projects without current state support (i.e., ownership or current Main Tier contracts), such as projects whose first date of commercial operation is prior to January 1, 2015, are eligible for "growth tier" RPS obligations (e.g., Class I or Tier I RPS obligations) in states within control areas adjacent to New York;
- RECs associated with expired NYSERDA RPS Main Tier contracts; and
- RECs associated with the portions of projects with Main Tier RPS contracts still in effect that are not currently purchased by NYSERDA.

Tier 2B: Non-Competitive Sub Tier

This sub-tier is intended to provide sufficient revenue to maintain New York's renewable baseline which is not eligible for

"growth tier" RPS obligations in states with control areas adjacent to New York. For example, existing small hydro facilities may not be able to meet access or eligibility requirements for markets outside of the New York control area. All other renewable supply described above not eligible for Tier 2A would fall under Tier 2B.

3. Cost Management

As a condition for approving the CES, the Commission will need to evaluate an estimated range of costs. Cost projections will occur in a range depending on numerous assumptions, including the penetration of energy efficiency, the cost of new renewable generation projects, the market price trends of electric energy and capacity, and the types of procurement used. Staff will present a range of cost estimates, in a time frame that allows for consideration and comment by parties well in advance of a Commission decision.

Cost Control Measures

There are several CES design features that can be implemented to control costs. The most direct control feature is the Alternative Compliance Mechanism, discussed above. Others include adjustment of targets pursuant to triennial review, providing long-term clarity on CES targets, and adopting flexibility mechanisms such as banking excess compliance as further discussed below. More widely, Staff will continue to consider how to maximize the cost-effectiveness of the CES through design features such as differentiation by technology.

Adjustment of Targets

The triennial review will review load forecasts, compliance performance, and the adequacy of projected renewable energy supplies to meet the increase in the Tier 1 percentage requirement.

If the Commission finds that there has been (or there may be) an accelerated development of resources or an inadequacy of supplies, it may adjust the implementation of the scheduled percentage increase accordingly. Alternatively, a feature could be implemented that would stop the obligation level from rising more than a determined quantity above current actual renewable generation levels on an annual basis. Either approach could provide a safety valve in case of divergence of supply and demand (allowing supply to catch up to demand) without undermining the development community's confidence in the market or the Commission's long-term commitment to the targets. To that end, it is important to confirm that conditions under which such an option would take effect are carefully limited to objective measures.

Long-Term Clarity on CES Targets (after 2030)

The CES target is designed to incentivize investment in capital-intensive, long-lived renewable energy generators. Financing terms will be more attractive if there is clarity that the ultimate targets, once reached, will be maintained for a sufficient period to allow investors to amortize their investments and realize expected returns on their investments over a number of years. Such clarity could be provided by specifying that in 2031 and each year thereafter, the minimum target established in 2030 or in such year that the ultimate target is reached (if deferred under the provisions described above) will be maintained (at a minimum) for a specified number of years (e.g., 20) unless the Commission determines that such maintenance is no longer necessary for either amortization of investments in CES resources or for maintaining the CES targets and objectives.

Banking and Borrowing

Many states with RPS policies include provisions that allow flexibility to compliance entities for meeting their RPS requirements. Two primary flexibility provisions are the banking of excess compliance, and borrowing. If permitted, LSEs can bank RECs from one year and use them in a subsequent year, usually subject to a time limitation (e.g., two or three years) and a percentage of RPS compliance obligations (e.g., 30 percent). Banking greatly reduces the uncertainty for LSEs to predict exactly how many RECs will be needed, and helps smooth the fluctuations of REC supply between shortages of RECs in one year or excess RECs in another year. It provides LSEs with the ability to effectively buy insurance (in years of adequate supply) against possible future shortages. Banking may also have the beneficial effect of encouraging earlier installation of RPS-eligible facilities (and creating a market outlet for RECs from such earlier construction), as well as building larger plants in order to take advantage of banking.

Compliance borrowing is the opposite. Here, LSEs can postpone any shortfall of RECs to the following year by applying (for example) RECs from the first quarter of the following calendar year to the current year's obligation. As with banking, there is typically a time limitation on borrowing, such as one or two calendar quarters. REC borrowing also smoothes the year-to-year fluctuation of REC supply but also allows LSEs to avoid or defer alternative compliance payments or noncompliance penalties.

Staff recommends that, at a minimum, banking be allowed and seeks comments on a term limitation and percentage of allowed obligation, as described above. Staff also seeks comments on the provisions of borrowing and whether or not it would likely be needed in the near-term, and how default by an LSE should otherwise be addressed.

Distribution-Level REV Implications

As described in the objectives above, the CES must be considered in a broader context than the details of the program and its specific goals. The REV Framework Order identified impending carbon reduction requirements as a major driver of the need for REV reforms. REV reforms will reduce the costs of compliance with the CES by greatly expanding the scope and applicability of dynamic load management at the distribution level. Along with accurate pricing and the market facilitation of utilities acting as integrators, load management will reduce capacity needs and facilitate economic balancing of a bulk system that is more reliant on weather-variable generation. Equally important, the CES framework will be a driver of progress toward REV objectives. The CES will properly value the environmental attributes of clean distributed resources and thereby enhance their market penetration.

B. Nuclear Facilities

1. Nuclear Market Conditions

New York's carbon reduction strategy relies on robust energy efficiency and significant expansion of renewables, but forward progress in reducing carbon also requires steps to ensure that existing, safe emissions-free sources of electricity remain operational. The State's largest zero-emission source of electricity is currently nuclear power plants. In 2014, nuclear generation accounted for approximately 30% of New York's consumed electricity. New York's nuclear power generating stations have produced on average over 46,000 GWh of emission-free power per year over the past five years.

Over the past several years, New York's consumers have benefited from low natural gas prices, helping to lower both retail electric and gas utility bills. Natural gas prices have decreased from the $6-$9 per dekatherm (Dth) range experienced from 2003-2008

to below $4 per Dth for the past few years. However, nuclear generation stations in upstate New York now find themselves facing challenging market conditions.

The low natural gas prices and the concomitant low electric wholesale energy market prices have led to lower revenues for all generators. This is an especially significant problem for upstate nuclear plants, which rely heavily on energy revenue margins to maintain their financial viability. The current market environment has resulted in multiple nuclear plant closure announcements in upstate New York and New England.

Specifically, the Robert Emmett Ginna (Ginna) nuclear power plant, in Ontario, New York, recently announced plans to close due to uneconomic operating conditions. Even though the plant is fully licensed by the Nuclear Regulatory Commission (NRC) to operate through September 2029, the low energy market revenues available to it due to the state of the natural gas market have meant that the plant would be operating at a loss without an additional source of revenue. In response to this closure announcement, to maintain system reliability, Rochester Gas & Electric Corporation, the investor-owned utility where Ginna is located, agreed to a Reliability Support Service Agreement (RSSA) with Ginna designed to provide payments to the plant owner (Exelon Corporation) through April 2017. The RSSA provides the plant with out-of-market payments, and in turn customers get the reliability benefits of the plant continuing to operate.[17]

In November 2015, Entergy Corporation (Entergy) announced its plan to close the James A. FitzPatrick (FitzPatrick) nuclear power plant in Scriba, New York by early 2017. The company cited

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[17] Case 14-E-0270, Petition Requesting Initiation of a Proceeding to Examine a Proposal for Continued Operation of the R.E. Ginna Nuclear Power Plant, LLC., Reliability Support Services Agreement (filed February 13, 2015).

"continued deteriorating economics" for the plant, and intends to close it at the end of its current fuel cycle. The plant is fully licensed by the NRC to operate until October 2034.

It is not only nuclear plants in upstate New York feeling this market pressure. Entergy shut down its Vermont Yankee nuclear plant in December 2014 due to these concerns, and has announced plans to close the Pilgrim nuclear power plant in Massachusetts by June 2019.

The economic pressures facing Ginna and FitzPatrick also apply to the Nine Mile Point 1 and 2 plants. In total, these upstate plants provide approximately 16% of the State's energy. Their closure would have dramatic impacts on New York, in particular on the State's effort to lower GHG emissions.

New York has been active in pursuing lower emissions of GHG and other pollutants. For the electric industry, this has included participation in the Regional Greenhouse Gas Initiative, Inc. (RGGI). The closure of the upstate New York nuclear plants due to the current natural gas market prices, and concomitant electric prices, would have a large negative impact on the State's ability to meet its carbon reduction goal. If the upstate New York power plants were to close in the near-term, New York would have to procure more of its electricity from fossil fuel generating plants, primarily those burning natural gas, resulting in significant increases in carbon dioxide (CO_2), nitrogen oxide, and other air pollutants.[18] For CO_2 alone, this would mean over 15.5 million metric tons of additional emissions each year.[19]

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[18] "New York Nuclear Power Plants' Contribution to the State's Economy," The Brattle Group, September 2015 (Brattle Report).

[19] The upstate New York nuclear power plants account for approximately 60% of all New York nuclear generation. The Brattle Group estimated New York's GHG emissions would rise by approximately 26 million tons if all of the State's nuclear plants were to close (Brattle Report, p. 10).

2. Nuclear Tier

The State can lower GHG emissions by installing new renewable energy generation so that a growing percentage of the State's electricity needs are met by a zero-emission source. Concomitantly maintaining currently operating zero-emission sources that face financial difficulty, thus avoiding using additional fossil generation, helps avoid an increase in GHG emissions.

Staff proposes that a Nuclear Tier be created to ensure that emission-free power from eligible operating nuclear generating plants is properly valued. This tier will prevent backsliding from the State's efforts to limit GHG emissions. The goal of New York is not just to have a certain lower level of GHG emissions in any given year (e.g., 2030), but also to limit emissions as much as possible in interim periods as well, keeping in mind that this limitation is further restricted by reliance only on those emission-free resources that are eligible, as described below. The nuclear tier supports a smooth emission-free transition from nuclear to non-nuclear resources in the event that energy prices are not able to support the continued financial viability of the plants during their license lives.

3. Nuclear Zero Emission Credits (ZECs)

A separate obligation not associated with the renewable mandate will be reflected in Tier 3. This tier is created to facilitate a market to recognize the value of fully licensed nuclear power plants that face financial difficulties, as a source of zero-emission electric generation, something which is not adequately captured in the energy market today. Similar to the Ginna RSSA, ZECs are an opportunity to provide qualifying nuclear plants with support payments, reflective of their going forward costs of operation, to ensure they continue to operate, to assist

the State in maintaining low GHG emissions and to continue to provide fuel diversity and price stability.

As with RECs, all LSEs will be required to procure ZECs from qualifying resources. ZECs are not eligible to demonstrate compliance with the renewable energy mandate, but are rather, as discussed above, a bridge to the State's renewable energy goals.

LSEs could procure ZECs either through direct purchases from qualified resources, purchases through an established ZEC marketplace or direct arrangements with an entity that has surplus ZECs, or through innovative bilateral transactions such as bundled energy and ZEC arrangements.

ZEC payments will be made to the qualifying resources based upon the MWhs which are produced. If output of the qualifying resources is below the level of the associated ZECs target, then the statewide ZEC requirement will be lowered to match the MWh output level.[20]

4. Nuclear Eligibility

In order to qualify as a resource eligible to sell Tier 3 ZECs, nuclear facilities must have an in-service date of January 1, 2015 or earlier, be facing financial difficulty as determined by a Staff examination of the books and records of the facility, operating pursuant to a fully renewed license by the NRC until 2029 or beyond, and consistent with any other federal and state

[20] The ZEC mandate should begin on April 1, 2017, as this is approximately the date when the Ginna RSSA expires and when FitzPatrick has announced it will be closing. Thus, the ZEC requirement for 2017 will be based on only a partial year.

authorizations.[21] This requirement will allow support to be provided to existing zero-emission plants whose closure would lead to an increase in GHG emissions from current levels. Eligibility of a nuclear facility under this program will expire upon the expiration of its current license term.

These eligibility criteria reflect the State's interest in minimizing the level of customer support for ZECs to only those facilities that are currently experiencing, as well as forecasted to experience, financial difficulty. In addition, it is important that these nuclear generating units are operating pursuant to full federal and state permits and authorizations. Requiring LSEs to procure ZECs from entities that may not be allowed to operate would cause inefficiency in the marketplace and possible unwarranted costs to consumers. As to demonstrating financial need, any participating resource must make financial information available to Staff so that estimates of the level of support payments required to maintain continued operation can be derived.

5. Tier 3 ACP

Due to the limited number of qualified sellers of ZECs, in order to protect ratepayers from the exercise of market power, the maximum price that would be paid per ZEC should be administratively set by the Commission and should be updated every year based upon the difference between the anticipated operating costs of the units and forecasted wholesale prices. In this manner the Commission will be only setting an appropriate and fair value of the environmental

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[21] The quantity of ZECs the White Paper recommends is based on the assumption that FitzPatrick and Ginna are continuing to operate. The initial levels of support are designed to assist these units, which have announced their planned retirements for early 2017. Should it become apparent that those plants likely will not be operating, the Commission should re-evaluate the quantity of ZECs which will be mandated.

attribute and will be acting independent of the actual wholesale prices for energy and capacity in the NYISO administrative market.

C. The Role of Long-Term Contracting Mechanisms

1. The LSR Options Report

In the REV Framework Order, the Commission called on Staff and NYSERDA to evaluate a range of LSR procurement structures and designs that could increase LSR generation in New York, while also continuing to competitively and cost-effectively achieve the primary objectives of the REV framework. In view of the expiration of the existing RPS program, on June 1, 2015, the Commission instituted a new LSR Proceeding with Notice of the filing of the Options Report, soliciting comments, and provided for a technical conference.[22]

The LSR Options Report and the comments that were received from parties comprise a valuable resource.[23] The Options Report explored a range of policies, frameworks and structures for procuring and enabling cost-effective financing for LSR resources. It presented criteria and economic analysis for evaluating the various options based on the goals articulated in the REV regulatory proceeding, most notably: assisting the creation of sustainable markets; developing new value-added options for electricity customers; maximizing value to the electricity system; maximizing generation; and minimizing costs.

The Options Report identified several mechanisms for long-term procurements as a means of enabling cost-effective financing of new

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[22] Case 15-E-0302, et al. In the Matter of the Implementation of a Large-Scale Renewable Program, Notice Instituting Proceeding, soliciting comments and Providing for a Technical Conference (June 1, 2015).

[23] Case 15-E-0302, supra, Large-Scale Renewable Energy Development in New York: Options and Assessment (June 2015) (Options Report).

LSR generation at a scale contemplated by the SEP. Key elements considered included how procurements are structured, who conducts the solicitation and evaluation, what project types are eligible to compete, what commodities are procured, and who serves as the counterparty to these long-term contracts. Within the range of development options described in the report, three primary structures with a series of variants emerged as key options:

Option 1: NYSERDA conducts solicitations and enters into long-term contracts with renewable energy developers for either a fixed price REC (the Status Quo), or a variable priced (V-REC) contract.[24]

Option 2: A state entity conducts solicitations and enters into long-term "bundled" energy and REC (and possibly capacity) power purchase agreements (PPAs) with renewable generators.[25]

Option 3: The electric distribution company conducts solicitation for long-term bundled PPAs (Option 3A) or, alternatively, there is an open-source solicitation that allows head-to-head competition between proposals for PPAs and utility-owned generation (Option 3b).

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[24] In its simplest form, a variable contract would consist of a "strike price" minus an "energy index price" for all the MWh produced by a project in an applicable period. Generators would have two revenue streams: (a) payments from the NY ISO for energy (and possibly capacity) and (b) attribute payments, with the attribute payment being the difference between the "strike price," designed to cover a project's revenue requirements, and an energy index. Periodically, payments would be made based on the difference between this fixed strike price and an energy index, with the energy index usually having a strong degree of correlation with the energy LBMP for the generator's node.

[25] This entity could be existing or newly created by the State. Legislative authority may be required to pursue certain options.

Several strategies to ensure fair competition and evaluation (particularly between PPA proposals and utility-owned generation) were identified in the Options Report. Based on detailed financial analysis, a V-REC or variations of Options 2 or 3 were expected to contribute to enhanced financial efficiency relative to the Status Quo.

The Options Report found that State policy objectives articulated through REV and the SEP would be best accomplished through a combination of near- and long-term steps that leverage existing programs and authority, provide revenue certainty for project developers, advance new contracting and ownership models for renewables, and create new opportunities for large end users to buy the renewable energy products their shareholders may demand.

In considering these objectives and options, the Options Report recommends several options for consideration:

- Bundled PPAs that include both RECs and energy (and perhaps capacity), to reduce costs and electricity price volatility.
- Flexible procurements to foster competition and ensure the selection of the lowest-cost projects.
- Centralized project solicitation/evaluation by a third party.
- Procurements conducted for quantities to meet a planned budget, system needs, and other considerations.
- New mechanisms to facilitate voluntary market activity.
- Securitization to lower the cost of project debt.
- Long term commitment to stimulate greater investment in New York and put LSR resources on a path to grid-parity.

Stakeholder Feedback

Substantial stakeholder feedback was provided in the LSR proceeding in general, and specifically on the Options Report. Environmental advocates, renewable trade associations, utilities,

customer representatives, developers and technology advocates, municipalities, and others provided various views on procurement options and program design elements. While no single program or method of procurement identified in the Options Report was overwhelmingly preferred by all stakeholders, the large majority of comments supported all of the recommendations above. These comments assisted with Staff's recommendations for development of long-term procurement mechanisms, as further discussed below.

2. Consideration of the LSR Options Report in the Context of a CES

The Options Report was developed prior to the CES mandate. Operation of a CES as described herein or any CES must be aligned with the development of a distinct procurement or development obligation that best minimizes the long-term cost to consumers. For the reasons set forth below, Staff supports a requirement on EDCs to procure an appropriate percentage of the REC target through long-term contracts with renewable generators. However, in keeping with the Commission's policy favoring market solutions as opposed to regulatory solutions, we propose that this obligation must be complimented with opportunities to incent a fully functioning self-initiated and competitive renewable energy market for both suppliers and consumers.

The Commission should require a designated level of EDC procurement via long-term REC and power purchase agreements. The crux of the analysis in the Options Report is that a bundled long-term power purchase agreement between a developer and a credit-worthy counter party is the least expensive way to develop new renewable resources in the near-term. Developers of new projects, whether renewable or non-renewable, face multiple risks in a competitive market. First is demand risk; developers must assume that there will be willing counterparties during the life of the

generating facility. The CES mitigates this demand risk for renewables since the mandate itself creates a market.

Even with the presence of a mandate, risk remains. First, because technology prices are dropping, developers take the risk that purchasers will be able to buy RECs from newer, more cost effective resources. Second, to the extent the developers are reliant on the NYISO spot energy and capacity markets to cover the difference between the REC revenues and their costs, they confront the risk of a revenue shortfall should energy or capacity prices drop below forecasted levels.

These risks are in reality similar to the risk of any generator in a competitive market. The difference for renewable projects, however, is that in the competitive market, generators are able to choose the technology and fuel source that they independently determine will clear the market and thereby mitigate their risk.

One of the key objectives of the proposed CES design is to minimize the cost of the mandate to consumers, by minimizing the price of RECs. However, in a REC-only market, it should be anticipated that developers will transfer the energy price and demand risks described above to consumers. Developers will require higher REC prices to help them manage these risks. As discussed at length in the Options Report, bundled long-term PPAs between the developers and credit-worthy counter parties are an obvious solution for developers. Like any long-term output agreement, PPAs provide the developers with energy price and demand certainty, which in turn will have the effect of reducing prices of RECs in a liquid REC market.[26]

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[26] For purposes of this paper, unless noted otherwise, "PPA" should be read as bundling RECs with energy and/or capacity.

New York has first-hand experience with the benefits of long-term contracting as a mechanism to enable the development of renewable energy. For example, the successful development of distributed PV is based in part on the use of PPA where the developer is able to obtain long-term commitments for the sale of electricity and the monetization of RECs. Similarly, the Main Tier solicitations have successfully relied on long-term contracts for the purchase of RECs.

This experience is not unique to New York. The most common form of procurement of large-scale renewable resources in the restructured Northeastern United States is for utility contracting of energy and RECs (and sometimes capacity) under 15 to 20-year PPAs for at least a portion of a State mandate.[27] In other parts of the country that have either partially, or not at all, restructured, new renewables are built either through competitive utility procurements and PPAs or utility ownership.

In order to achieve the State's renewable development and cost minimization goals, the Commission should ensure that EDCs procure an appropriate portion of the REC target obligations via long-term contracts including energy and/or capacity.[28] To further improve the opportunity for cost containment, Staff also recommends a central procurement that is accomplished by the utilities, as a group, with clear financial responsibility under a long-term PPA to third parties.

While the use of PPAs has the potential to reduce effective REC prices and lead to more cost effective renewable development, they are not without risk to consumers and REV's outcome-based

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[27] Massachusetts, Connecticut, and Rhode Island have these types of long-term utility contracting programs.

[28] Currently NYSERDA uses a 20-year term for RECs. As part of the implementation process, the Commission should solicit further comment on the ideal term length for a bundled product.

objectives. To the extent that technology costs are falling, or if commodity prices fall below forecasts, mandatory fixed priced PPAs could cause consumers to pay more for than necessary to achieve the CES. The recent history of restructuring reveals the challenges of fixing prices in a declining cost market. Moreover, a key objective of REV is to allow for, and encourage, business model innovation and self-initiated markets.

Mandates that impose costs directly through delivery rates are inconsistent with this objective. We note also that throughout the country many consumers, commercial, institutional and residential have expressed a preference for clean energy as a partial, primary or total source of their supply. Requiring mandatory purchases for all of the CES compliance obligations would no doubt have adverse consequences to the development of these markets. Indeed, to the extent consumers wish to move to clean energy as the source of their supply, the State has the opportunity to more than exceed New York's ambitious goals.

To reconcile these objectives, utilities should be required to purchase an appropriate portion of the REC target via long-term PPAs but should further be allowed to resell the procured RECs and/or energy to third parties, for shorter terms, when the utility can receive a higher value than it paid to the renewable generator. To provide an incentive to the utility to maximize such opportunities and minimize costs to ratepayers, utility shareholders should be allowed to keep an appropriate portion of the profits from such transactions. Utilities will perform this function in their capacity as EDCs and not in their capacity as commodity providers of last resort. When there are procurement costs (including RECs, energy, and capacity) that are not recovered through sales as described above, RECs can be subtracted from the REC obligations of all LSEs with cost recovery through the delivery charge.

The level of required EDC procurement of PPAs should be set at an amount that serves the objective of reducing compliance costs while leaving room for the development of a self-initiated market. NYSERDA will be available to administer the auction of PPAs on behalf of the EDCs. Staff seeks comments on the percentage of the REC obligation that should be purchased via utility PPAs and the specific incentive mechanisms for the utilities to minimize ratepayer costs.

3. Use of Central Procurement

For over ten years, NYSERDA has been the central procurement entity in New York conducting competitive solicitations for renewable generation attributes (equivalent to a REC) from new renewable generation projects. The NYSERDA RPS Main Tier procurement program was initiated in 2004 as the vehicle to facilitate financing of new renewable generation as the primary tool for implementation of New York's RPS. These contracts have been for fixed prices for attributes (and in the future, once NYGATS is up and running, RECs). Contract durations were originally for terms up to ten years, with the maximum term length extended in 2014 to 20 years. The Options Report details the advantages of central procurement from a cost minimization perspective. Staff agrees with this perspective. The use of central procurement of the RPS Main Tier by NYSERDA has historically helped reduce the cost of acquired resources.[29]

[29] NYPA has suggested that it could serve as a voluntary buyer against all sellers, but noted it would require legislative authority to accomplish this purpose. Staff appreciates NYPA's offer and stands ready to further explore the legislative and legal issues associated with NYPA's participation in CES. At this time, however, Staff's proposal is structured without use of NYPA as a voluntary buyer of renewable resources.

Staff proposes that NYSERDA should continue to issue solicitations for contracts to purchase RECs during the initial years of the CES. These RECs can then be allocated or sold to LSEs toward the fulfillment of their CES obligation. In an Implementation Plan, Staff and NYSERDA will identify a method for ultimate REC disposition and for financially securing NYSERDA's role as a central procurement agent. While this activity of NYSERDA will be designed to be revenue neutral, some degree of assurance against risk will be needed. The Implementation Plan will include a provision for EDCs to serve as a financial guarantor. The continuing need for NYERDA's role in procurement should be evaluated in the Commission's triennial reviews.

Central procurement can also be efficient in the context of utility procurements. The Commission should require utilities to participate in a common solicitation for PPAs as discussed above. As part of its implementation and to facilitate the market, Staff will work with the utilities and NYSERDA to develop standardized contracting arrangements and procurement methodologies to ensure that the solicitations result in the best outcomes for consumers.

4. Utility Ownership and Self-Initiated Market Development

One of the most contested issues in the LSR proceeding is whether the Commission should allow distribution utilities to participate as owners in a competitive procurement for new renewable resources. In this context, the debate is with respect to activities of the utilities' regulated distribution companies, not their non-regulated affiliates.

The arguments the Joint Utilities (JU) offer in favor of allowing utility ownership are that the regulated utilities have a lower cost of capital and, because they also have more flexibility relative to recovery, their participation can help minimize the

risk to consumers. The JU also objected to the risk to their shareholders of long-term PPAs with no guaranteed recovery and noted that, in any event, shareholders should be compensated for any balance sheet impairment.

Arguments by IPPNY, ACE and others pointed to the fact that allowing utilities entry into the market would impair competitive market development since it would deter third-party entry. Further, it was argued that because their costs are not fixed, utilities could expose consumers to greater price risk from cost overruns than third party fixed price PPAs.

In some states, utilities have the opportunity to solicit for the purchase of renewable generating development assets, including the associated RECs, as opposed to a standard PPA where the ownership remains with the developer. These arrangements are known as utility-owned generation (UOG).[30] Even with utility ownership, the actual operation of the facilities remains in the hands of a third party under a contractual arrangement. Consequently, under this model the utilities' principal role is simply using its lower cost of capital as a mechanism to reduce costs and gain earnings from the project.

Staff acknowledges that utility cost of capital may be lower than the risk capital of third-party investors. Utilities may also have the ability to take advantage of federal tax credits, and allowing some level of utility ownership can inure to the benefit of consumers to the extent these credits and lower cost of capital reduce compliance expense.

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[30] These types of procurements have been conducted by a number of vertically integrated utilities, including Pacificorp (2009 Pacificorp RFP for Renewable Electric Resources, http://www.pacificorp.com/content/dam/pacificorp/doc/Suppliers/RFPs/RFP2009R_MainDocOnly_7-8-09.pdf, Renewable Energy RFP) and Oklahoma Gas and Electric Company (2009 Wind Energy RFP, http://imaging.occeweb.com/AP/CaseFiles/003FFDA2.pdf).

However, while the UOG model is prevalent in non-restructured or partially restructured states, it is not prevalent in the Northeast with very limited exceptions. Consequently, if New York permits utility ownership, third parties may choose not to enter the New York markets because of competitive risks. Allowing utilities as owners to reduce near-term costs may chill the market and the effect will be less rather than more competitive efficiency.

The question before the Commission is whether the potential advantages of UOG support an exception to the Commission's long-standing policy against regulated utility re-entry into the generation market. In the Track One Framework Order, the Commission found that allowing utilities as Distributed System Providers to own distributed generation would impose market power concerns and conflict with the desired business model of the DSP as a market enabler. The long-term inhibition of market efficiency outweighs the near-term advantages. The Commission noted, however, that a potential exception to this rule is where utility ownership serves a particular social objective, such as offering protections and the opportunity to participate to low-income consumers, or where there is a market failure.

Consistent with this policy, Staff concludes that it is not necessary or advantageous for utilities to participate in mandated PPA solicitations under the utility ownership model. Rather, participation in these solicitations should be reserved to third parties with the regulated utilities as counterparties.

At the same time, Staff agrees with the JU that an absolute prohibition of utility participation in the ownership structure may not be in the interests of consumers. We disagree with IPPNY and others who suggest that allowing any level of utility ownership at all will necessarily expose consumers to greater price risk or chill the development of competitive markets. Utility involvement

is not inherently uneconomic. Regulatory arrangements could be structured to require risk levelization between utility and non-utility procurements. The presence of a mandated PPA differentiates this situation where utilities are allowed to compete on a regulated basis with merchant generation in a competitive market.

Nonetheless, in the interest of encouraging competitive entry into New York markets, Staff recommends that the Commission adhere to the principles articulated in the Framework Order wherein utility ownership of generation is only permitted in exceptional circumstances where there are demonstrable consumer benefits that could not otherwise be achieved. Appropriate deployment of utility capital in collaboration with private developers, ESCOs, NGOs and other market participants that adhere to the Framework Order principles and drive down the cost of compliance should be entertained. In addition, an important driver of the CES will be the economic benefits of a market for clean energy projects built in New York. Utility-owned generation can serve as a correction to a potential failure of the market to develop sufficient levels of instate resources. The Commission should authorize innovative investments that allow for use of utility capital to lower costs of compliance with the CES while at the same time demonstrating how the utility investment will advance and not inhibit private investment.

D. Targets for Each Tier Through 2020

The following tables show illustrative annual statewide targets for each tier, to achieve an interim 2020 goal. Successful markets for renewable development will require clarity and predictability in the schedule of annual targets. Staff will work with parties and NYSERDA to develop schedules for the Commission to

adopt, which will be subject to triennial review to keep the CES on track to meet its 2030 goal.

Tier 1

Year	GWh Target	Mandate as a % of Forecasted Load
2017	1,536	0.9%
2018	2,446	1.5%
2019	3,465	2.1%
2020	5,465	3.4%

Tier 2A

Year	GWh Target	Mandate as a % of Forecasted Load
2017	1,931	1.2%
2018	2,472	1.5%
2019	3,198	2.0%
2020	3,198	2.0%

Tier 2B

Year	GWh Target	Mandate as a % of Forecasted Load
2017	15,330	9.5%
2018	15,374	9.6%
2019	15,423	9.7%
2020	15,423	9.7%

Tier 3

Year	GWh Target	Mandate as a % of Forecasted Load
2017	7,500	4.6%
2018	10,000	6.2%
2019	15,000	9.4%
2020	25,000	15.7%

E. Program Implementation

The CES will require detailed procedures prior to its launch in 2017. Therefore, Staff recommends that within 30 days after issuance of the Commission's initial CES order, that it provide, in consultation with NYSERDA, an Implementation Plan for review and comment. The Implementation Plan would address, at a minimum, the following details:

- Schedule of annual targets
- NYSERDA's administrative functions;
- Level of PPA procurements by EDCs;
- Procurements for RECs conducted by NYSERDA;
- Funding mechanisms;
- Disposition of RECs and ZECs;
- Schedule of ACP for each Tier;
- Payment structure to eligible facilities;
- Regulatory review processes; including details on monitoring and reporting requirements; and,
- Program Evaluation

APPENDICES

Appendix A: Regional Market Context

Other states in the Northeast[1] have established Renewable Portfolio Standards with common characteristics of obligations placed on the load serving entities and reliance on a REC market for demonstrating compliance. The majority of these states have established RPS 'growth' tiers, commonly labeled 'Class 1' or 'Tier 1', focused on increasing the quantity of new wind generation and other larger scale renewables. States with restructured electricity markets and a substantial pre-restructuring portfolio of renewables, have often focused on development of new renewable facilities by establishing a vintage date for incremental new renewables.[2] The New England RPS programs all allow imports of energy and RECs from control areas adjoining the ISO-New England control area, including the New York ISO, subject to delivery requirements; programs in PJM have slightly varying geographic eligibility but typically follow a similar requirement that energy be delivered to PJM for a generator to be eligible.

Since the inception of New York's RPS, several neighboring states - Massachusetts, Connecticut, Rhode Island, and Maine - have introduced renewable energy procurement/long term contracting policies for large-scale renewables alongside their RPS policies, whereby longer term utility PPAs for bundled RECs, energy, and

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[1] States with RPS obligations of this type include Maine, New Hampshire, Massachusetts, Connecticut, Rhode Island, Pennsylvania, New Jersey, Maryland, Delaware, as well as the District of Columbia. Vermont is in the process of implementing a Renewable Energy Standard to be effective in 2017.

[2] For example, built in 1998 or afterwards (Massachusetts and Rhode Island), 2006 or afterwards (New Hampshire and Maine), and without any vintage requirement (Connecticut).

sometimes capacity are offered that hedge energy price risk for renewable project developers.[3] In the PJM states, there has been less impetus to drive similar procurement policies in support of Tier I RPS policies due to a combination of factors including less aggressive RPS targets relative to available supply, access to a more robust supply base (including Midwest wind), and substantial volumes of excess RECs banked in the PJM REC tracking system against future compliance obligations. As a result, such long-term contracting has not been as ubiquitous in these states, instead limited to narrow instances targeting offshore wind or distributed generation. This situation may evolve in the near-future as increasing RPS targets are beginning to eat way at past surpluses.

These contracting policies offer substantial revenue certainty for generators, typically for 15 to 20 years, the majority of the economic life of the asset. This type of contract serves as an incentive to attract renewable energy project developers to develop and build LSRs in these states.

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[3] Procurement pursuant to:

Massachusetts: Green Communities Act (GCA), 2008 Mass. Acts c. 169, sec. 83; Sections 35 and 36 of Chapter 209 of the Acts of 2012, An Act Relative to Competitively Priced Electricity in the Commonwealth, amended GCA Section 83 and inserted GCA Section 83A which directed the Department of Energy Resources to adopt regulations regarding additional competitively solicited long-term contracts for renewable energy.

Connecticut: An Act Concerning Connecticut's Clean Energy Goals, Public Act 13-303, sec, 6, 7 and 8; and An Act Concerning Affordable and Reliable Energy, Public Act 15-107.

Rhode Island: 2009 Long-Term Contracting Standard for Renewable Energy (Chapter 39-26.1).

Maine: An Act to Enhance Maine's Energy Independence and Security, P.L. 2005, ch. 677(ME. REV. STAT tit. 35 § 3210-C 2014), as substantially modified since.

Maine's procurement policy initially included REC purchases but currently only allows for procurement of capacity and energy. New Hampshire and Vermont utilities have also engaged in long-term contracting for renewables on a more ad hoc basis, subject to regulatory approval.

New England REC Pricing

REC prices in neighboring RPS compliance markets in which New York renewable energy generators are eligible also provide important context to consider in exploring the approaches necessary to meet the CES targets. Market prices for Massachusetts, Connecticut, Rhode Island, and New Hampshire Class I RECs have traded in the $50 to $60 per MWh range during the past 3-4 years due to the market being either short of supply, or with very small surpluses, compared to RPS demand (See Figure 1). In contrast, current spot market and near-term forward market REC prices in neighboring PJM Tier I markets are in the $15 to $16 per MWh range.[4]

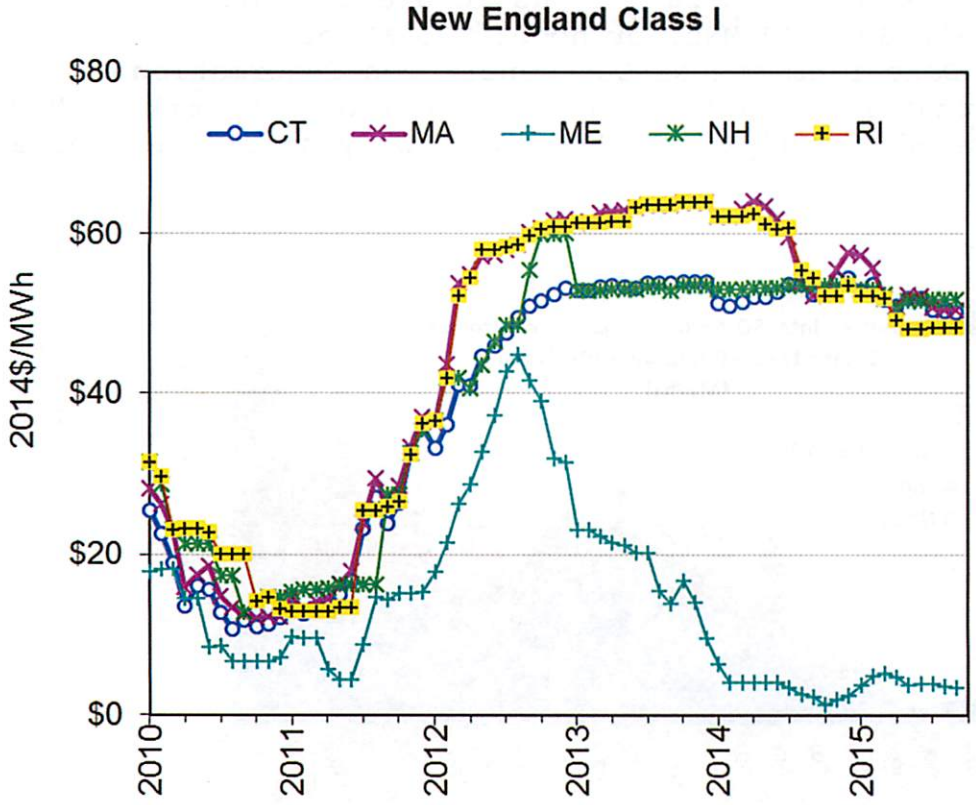

Figure 1: New England Class I REC Price History since 2010. (Sources: Lawrence Berkeley National Laboratory, Marex Spectron[5])

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[4] This price data is gleaned from recent REC broker daily price quote data widely available to market participants.

[5] Depending on the source used, plotted values are either the mid-point of monthly average bid and offer prices or the average monthly closing price, and generally refer to REC prices for the current or nearest future compliance year traded in each month.

These New England REC prices - often twice the level paid through NYSERDA long-term RPS Main Tier contracts - have attracted substantial exports from renewable generating facilities located in New York into New England. These exports have included generation ineligible for NYSERDA Main Tier RPS (landfill methane, wind and hydro facilities commencing operations before 2003), the uncontracted portion of energy production from projects with NYSERDA Main Tier contracts (NYSERDA purchases 95% or less of the RPS Attributes from most Main Tier projects), as well as a small number of new projects eligible for NYSERDA Main Tier contracts but which find the opportunities in New England sufficient to finance their construction. For example, in 2013, New York wind and landfill gas projects supplied 20% of Massachusetts RPS Class I demand—approximately 800,000 MWh, or about 275 MW of wind at a 33% capacity factor.[6] Data from the NEPOOL Generation Information System indicates that renewable energy flowing from New York to New England have exceeded 1 GWh/year in the last two years. (See Figure 2).

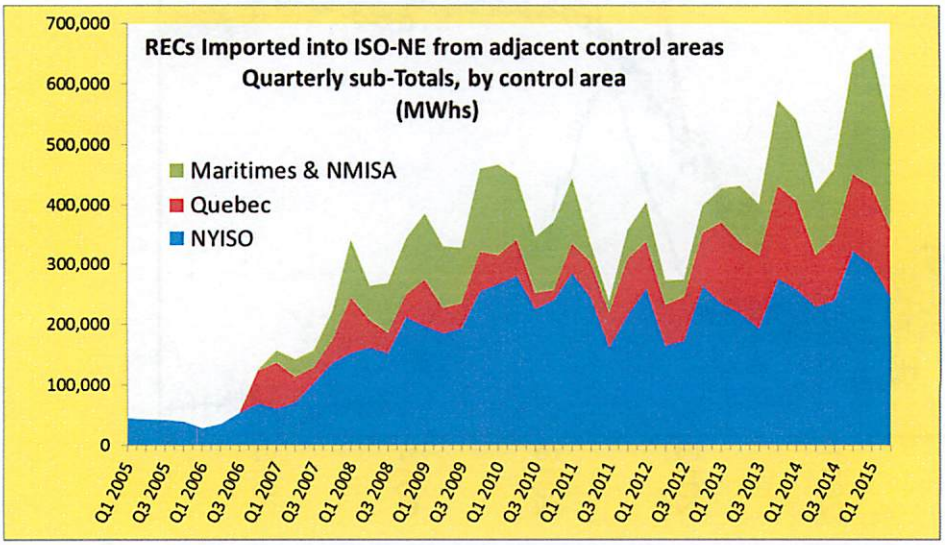

Figure 2: Recent Supply of New England Class I RECs from Generators Outside New England (MWh per Calendar Quarter). (Source: Sustainable Energy Advantage, LLC analysis of NEPOOL Generation Information System data)

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[6] Massachusetts RPS & APS Annual Compliance 2013 Report, http://www.mass.gov/eea/docs/doer/rps-aps/rps-aps-2013-annual-compliance-report.pdf.

New York's Legacy RPS Projects

Under existing New York State Main Tier RPS procurements, approximately 2,000 MW of renewable resources in New York have been placed under New York RPS Main Tier contracts to deliver RPS Attributes to NYSERDA. The vast majority of these contracts are for a 10-year duration and will come to an end as soon as January 2016, yet most have substantial remaining asset life (Legacy Projects). Under these RPS contracts, New York has no residual post-contract rights to the RPS attributes (RECs). In the absence of a New York policy that creates sufficient value for RECs from Legacy RPS Projects, the energy and RECs from most of these resources are likely to leave the market, most likely to the New England states, as their owners search to maximize revenues. This departure would preclude New York's ability to claim that renewable energy supply toward CES goals, as the right to make such claims accrues to the rightful purchasers of the associated RECs. It could also impact New York's method for compliance with Clean Air Act Section 111(d) targets, either directly (based on accounting procedures) or indirectly (because exported energy would need to be replaced by additional generation from resources including imports or in-state fossil-fueled generators).

Because of the way the New England RPS eligibility and REC markets are structured, existing Legacy Projects and some other generators[7] have the opportunity to compete in the New England market as "new" or Class I renewable resources and garner REC prices that are, at least, currently, at prices indicated above.

On the other hand, while the New England states have procurement programs for long-term contracts for energy and/or RECs from truly new renewable generation, there are few, if any procurement opportunities for contracts from existing renewable generators for terms exceeding one to three years,[8] and future REC prices are highly uncertain (they have been as low as $15). There are also significant costs and risks associated with exporting energy and RECs into New England, including meeting the stringent energy delivery requirements required under state's RPS programs, and

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[7] For example, any wind or landfill gas generation regardless of commercial operation date is eligible for the Connecticut Class I RPS. (Conn. Gen. Stat. §16-1(a)(20)).

[8] The lone material exception was Connecticut Public Act 13-303, Section 8, under which bundled PPAs between Connecticut electric distribution companies and two operating biomass plants were entered into pursuant to a competitive solicitation.

foregoing capacity revenues in NYISO markets (a Massachusetts requirement).

Historic New York Renewable Generation

In addition to the Legacy Projects rolling off of NYSERDA contracts, New York has a pre-2003 baseline mix of renewable generation supply consisting mostly of large state-owned or controlled NYPA hydroelectric generation. There is, however, an existing fleet of smaller non-NYPA-owned hydroelectric projects, biomass and small wind facilities that were in commercial operation prior to 2003.

As noted above, a subset of these generators is eligible for Class I RPS obligations in neighboring regions, while the remainder have limited options for REC revenues to supplement commodity revenues. While these generators have limited options to monetize their RECs for a material value, they are still eligible to sell their RECs into RPS markets for which they are eligible in several of the New England and PJM states, albeit for prices that are typically between $0.50 and $2 per MWh.[9] These market REC price levels have rarely (if ever) justified the transaction costs and risks necessary to export energy from such facilities to neighboring RPS markets. However, it is possible that access to such markets might be enabled with the advent of the NYGATs system (which will increase market liquidity and reduce RPS Attribute transaction costs) and the pending addition of Vermont's new Renewable Energy Standard[10] (which includes a Total Renewable Energy requirement targeting 55 to 75% of Vermont load, the majority of which is open to eligible renewable resources of any vintage, commencing in 2017).

Another important dynamic is that as electricity wholesale prices continue to decline, many of these pre-2003 renewable generators may find it increasingly difficult to garner sufficient revenues to cover their operating costs (operations and maintenance costs, property taxes). Under the current RPS program, eligible generators could appeal to the commission for a 'Maintenance Tier' contract to support continued operation; going forward, in the absence of such a policy support, some projects could cease operating.

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[9] This price data is gleaned from recent REC broker daily price quote data widely available to market participants.

[10] Vermont Act No. 56. An act relating to establishing a renewable energy standard.

Appendix B - Calculation of the 50 by 30 Goal

2030 Load Forecast

The calculation of the 50 by 30 goal began with the development of the load expected in the State in 2030. This was determined to be approximately 150,000 GWh, and thus the total renewable energy resources needed to meet the goal is approximately 75,000 GWh in 2030.

The load forecast used was based on the 2015 NYISO Goldbook (Goldbook), which provides annual load forecasts for 2015-2025. This forecast is of the load expected to be delivered to customers, and does not include existing behind the meter (BTM) resources which Staff considers to be electricity consumed within the State. Therefore, approximately 410 GWh of BTM load, the amount present in the State as of 2014, was added to the Goldbook estimates. Since the Goldbook only forecasted load through 2025, Staff estimated the 2026-2030 load by assuming load would grow at the annual pace the Goldbook projects load would grow from 2023-2025.

The Goldbook load forecast does not factor in the extensive electric vehicle and heat pump (EV/HP) load forecasted in the SEP. Nor does it take into account expected energy efficiency efforts from 2015 and on.

To account for the EV/HP load, Staff assumed that 8,615 GWh of such load would be realized by 2030. To reach this level, Staff started with a first year amount of 100 GWh in 2015 and assumed that in each subsequent year, the amount of EV/HP load would grow increase by nearly 20% over the previous years' incremental EV/HP load change. So in 2016, Staff assumed almost 120 additional GWh of EV/HP load, for a 2016 cumulative total of 220 GWh.

To factor in the impact of future energy efficiency efforts, Staff assumed an average annual Statewide energy efficiency achievement of 2,227 GWh. This represents the center of a range of possible outcomes and is not itself a target to be achieved in the context of the CES. The assumed figure was based on the Commission's recently approved target of 1,613 GWh for programs run by NYSERDA and the State's utilities.[1] Since this level of energy efficiency is only related to the utilities under the Commission's

[1] Case 14-M-0094, Proceeding on Motion of the Commission to Consider a Clean Energy Fund.

jurisdiction, Staff increased the number pro ratably based on their current load to factor in the energy efficiency efforts of direct NYISO customers, LIPA customers, and NYPA customers. The annual level of 2,227 GWh led to a forecast of 35,627 GWh of additional energy efficiency being achieved in the State by 2030.

The resulting Statewide load forecast is shown in the table below. The 2015 estimate of slightly more than 160,000 GWh is expected to decrease to approximately 150,000 GWh, as energy efficiency efforts outpace the modest growth forecast by the Goldbook as well as the load related to EV/HP load.

Year	Total Statewide Energy Need Prior to Energy Efficiency (GWh)	Cumulative Average Range of Energy Efficiency (GWh)	Statewide Energy Need after Energy Efficiency (GWh)
2015	162,858	2,227	160,632
2016	165,243	4,453	160,790
2017	166,574	6,680	159,894
2018	167,823	8,907	158,916
2019	169,822	11,133	158,689
2020	171,957	13,360	158,597
2021	172,893	15,587	157,307
2022	174,037	17,813	156,224
2023	175,220	20,040	155,180
2024	176,740	22,267	154,473
2025	177,825	24,493	153,331
2026	179,032	26,720	152,312
2027	180,386	28,947	151,439
2028	181,915	31,173	150,741
2029	183,653	33,400	150,253
2030	185,643	35,627	150,017

Calculation of Incremental Renewable Energy

As was mentioned, to meet the 50 by 30 goal, approximately 75,000 GWh of renewable energy will be needed in the State in 2030. To determine the incremental renewable energy that must be acquired to meet the 2030 goal, Staff determined a baseline amount of current renewable energy as of 2014.

In 2014, approximately 26% of the fuel mix serving load in New York State was supplied from renewable energy resources. These resources included all generation that delivered energy into the New York Control Area, net of exports. This baseline generation includes both in-state and out-of-state generation, as well as both RPS eligible and non-eligible renewable generation, such as large scale NYPA hydro. Staff used the Environmental Disclosure Program (EDP) data to determine the amount of electricity used in the State by fuel type. To this amount, we added the BTM electricity generated by renewable resources, such as photovoltaic panels.[2]

The table below shows the 2014 fuel mix of the State, according to the EDP and BTM resource data.

Statewide Fuel Mix For Electricity Generation

Fuel Type	GWh	Percentage
Biomass	609,293	0.4%
Coal	7,205,000	4.5%
Gas	58,454,000	36.7%
Hydro	35,834,762	22.5%
Nuclear	49,409,000	31.0%
Oil	708,000	0.4%
Biogas	394,314	0.2%
Solar (inc. BTM)	681,610	0.4%
Solid Waste	2,075,000	1.3%
Wind	3,775,684	2.4%
Total:	159,146,663	100.0%

In 2014, approximately 41,296 GWh of energy were consumed in the State which had been generated from a renewable energy source. In order to meet the 50 by 30 goal, which requires approximately 75,000 GWh of total renewable energy by 2030, approximately 33,700

[2] Since BTM generation is considered load in the analysis, Staff also included it as a generation source. Future BTM installations are expected to represent a sizeable portion of incremental renewable energy installed in the State to help meet the 50 by 30 goal.

GWh of incremental renewables are needed. In addition, the need to preserve the current baseline amount has led to the addition of a Tier 2 to the CES.

Staff assumes that the incremental renewable target will be achieved through obtaining energy from new, large scale renewable, as well as BTM resources.

Appendix C: Eligibility of Resources

CES Eligible Electric Generation Sources	Source	Other Requirements
Biogas	Landfill Gas (Methane) Reciprocating/Internal Combustion Engine	Only the electricity generated from eligible fuel is eligible.
	Sewage Gas (Methane) Reciprocating/Internal Combustion Engine	
	Manure Digestion (Methane) Reciprocating/Internal Combustion Engine	If required to have a SPDES permit by NYSDEC regulations, a Concentrated Animal Feeding Operation (CAFO) providing the manure must have and be in compliance with its current Agricultural Waste Management Plan (AWMP) developed by a duly qualified Agricultural Environmental Management (AEM) Planner and must be operating in compliance with any applicable SPDES permit. If not required to have a SPDES permit, the CAFO must be operating in compliance with the best management practices for a facility of its size set forth in the Principles and Water Quality Protection Standards specified in the Agricultural Environmental Management (AEM) Framework & Resource Guide developed by the NYS Department of Agriculture and Markets and the NYS Soil and Water Conservation Committee.
	Anaerobic Digestion (other biogas digestion using agricultural or food processing residues and by-products)	

	Biomass* Thermochemical Gasification (syngas)	
	Biogas (from eligible sources of biomass* feedstock) Combined Heat & Power	
	Biogas (from eligible sources of biomass* feedstock) Co-fired with existing fossil-fuel Combustion	Only the electricity generated from the eligible biomass portion of the fuel is eligible.
Biomass *	Biomass Direct Combustion	
	Biomass Combined Heat & Power	
	Biomass Co-fired with existing fossil-fuel Combustion	Only the electricity generated from the biomass portion of the fuel is eligible.
Liquid Biofuel	Biomass* Liquefaction through acid or enzymatic hydrolysis (Ethanol)	
	Biomass* Esterification (Biodiesel, Methanol)	
	Biomass* Thermochemical Pyrolysis (Bio-oil)	
	Biomass* Hydrothermal Liquefaction	

	Liquid Biofuel (from eligible sources of biomass* feedstock) Combined Heat & Power	
	Liquid Biofuel (from eligible sources of biomass* feedstock) Co-fired with existing fossil-fuel Combustion	Only the electricity generated from the biomass portion of the fuel is eligible.
Fuel Cells	Solid Oxide Fuel Cells (SOFC)	
	Molten Carbonate Fuel Cells (MCFC)	
	Proton Exchange Membrane Cells (PEM)	
	Phosphoric Acid Fuel Cells (PAFC)	
Hydroelectric	Hydroelectric Upgrades	No new storage impoundment, eligibility limited to the incremental production associated with the upgrade.
	Low-Impact Run-of-River Hydroelectric	No new storage impoundment.
Solar	Photovoltaics	
Tidal Ocean	Tidal Turbine	
	Ocean Wave Turbine	
	Ocean Current Wave Turbine	

	Ocean Thermal Pumped Storage Hydro Powered by Tidal	
Wind	Wind Turbines	

***Eligible Sources of Biomass[1]**

Agricultural Residue

Woody or herbaceous matter remaining after the harvesting of crops or the thinning or pruning of orchard trees on agricultural lands. Agricultural by-products such as leather and offal and food processing residues that are converted into a biogas or liquid biofuel.

Harvested Wood

Wood harvested during commercial harvesting.

Previous Commission Orders state that biomass facility owners must have and be in compliance with an approved forest management plan (FMP) to make use of biomass that fits under the definitions of "Harvested Wood" and/or "Silvicultural Waste Wood." The FMP should address the overall management goals and performance standards that need to be used during the procurement of the biomass resource for the facility. The FMP is required to include: standards and guidelines for sustainable forest management and requires the adherence to management practices that conserve biological diversity, productive forest capacity, and promote forest ecosystem health. The FMP must be completed by a qualified forester and approved by the Department of Public Service.

A copy of the approved FMP needs to be provided to each of the biomass suppliers for the biomass facility. Suppliers need to be in compliance with the FMP for the facility. Landowners supplying feedstocks to the suppliers are not required to have

[1] Details on certain requirements are more fully documented in the NYSERDA Publication: Biomass Power Guide, Revised July 22, 2014 available on the NYSERDA Website http://www.nyserda.ny.gov/Cleantech-and-Innovation/Biomass.

their own forest management plan. However, suppliers are required to prepare harvest plans for each parcel where harvested biomass is supplied to an RPS program eligible generator. This requirement should be clearly stated in the FMP. It should be further stated that harvest plan content and adherence to the harvest plan remains the responsibility of the participating biomass facility.

Silvicultural Waste Wood

Wood harvested during timber stand improvement and other forest management activities conducted to improve the health and productivity of the forest. The requirements for approved Forest Management Plans and Harvest Plans are the same as for "Harvested Wood" stated above.

Mill Residue Wood

Hogged bark, trim slabs, planer shavings, sawdust, sander dust and pulverized scraps from sawmills, millworks and secondary wood products industries.

Pallet Waste

Unadulterated wood collected from portable platforms used for storing or moving cargo or freight.

Site Conversion Waste Wood

Wood harvested when forestland is cleared for the development of buildings, roads or other improvements.

Sustainable Yield Wood (woody or herbaceous)

Woody or herbaceous crops grown specifically for the purpose of being consumed as an energy feedstock (energy crops).

Urban Wood Waste and Refuse Derived Fuel

Two types of refuse derived fuels qualify as eligible fuels:

1. The source-separated, combustible, untreated and unadulterated wood portion of municipal solid waste or construction and demolition debris, including biomass prepared by a densification process resulting in a uniformly sized, easy to handle fuel pellet or briquette.

2. Clean wood recovered from a Construction and Demolition (C&D) debris at a permitted Material Reclamation Facility (MRF) or C&D processing facility. This type of eligible fuel is subject to additional quality control safeguards and testing:

    - Solid waste management facility authorization from NYSDEC for the construction and operation of the MRF or C&D processing facility

    - Beneficial Use Determination (BUD) for the wood fuel product

    - QA/QC procedures for procuring, inspecting, sampling and testing Clean MRF Fuel as noted in the Biomass Power Guide

Adulterated Biomass

Adulterated biomass includes:

- all types of biomass that do not fall within the categories of eligible unadulterated biomass, such as paper, paperboard boxes, textiles, yard waste and leaves, non-recyclable wood (e.g. plywood and particle board);

- agricultural by-products such as leather and offal and food processing residues;

- other adulterated wood wastes and mixed adulterated and clean wood wastes

For biomass recovered from municipal mixed-waste streams or other adulterated biomass a primary conversion step to liquid or gaseous fuels is required. Power generation facilities that choose to use these types of biomass must demonstrate that emissions from electric energy production from the use of the adulterated feedstocks is equal to or less than the emissions for the process using unadulterated biomass feedstocks. This is only possible if the primary conversion step produces a clean gaseous or liquid fuel for the power conversion system as described in the Biomass Power Guide.[2]

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[2] http://www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-and-Environmental-Markets/RPS/RPS-Documents/NYS-RPS-biomass-guidebook.pdf

Co-firing eligible and ineligible resources

Projects that plan to co-fire unadulterated biomass with fossil fuels or other ineligible fuels have additional measurement and reporting requirements to ensure that only the electricity generated from eligible biomass is counted in the CES program. This requires separate feed and measurement systems for each fuel stream plus regular sampling and analysis of fuels to ensure that the reported eligible generation is based on an accurate measurement of heat input for each fuel stream to the boiler or other conversion system.

APPENDIX D: ACP DEVELOPMENT CONSIDERATIONS

An LSE has two options for compliance with the CES: procuring RECs, or making an alternative compliance payment. Since both options are legitimate forms of compliance, LSEs will not purchase RECs that cost more than the ACP,[1] and the ACP provides an ultimate limit on the per-REC cost of compliance. The following provides a discussion on factors to be considered when setting an ACP for each proposed tier within the CES. Parties are encouraged to comment on the most effective method for developing ACPs.

Tier 1: ACPs for 'growth tiers' are meant to balance the competing objectives of incenting LSEs to procure, and developers to develop, while protecting ratepayers from spikes in costs during shortages of eligible RECs to satisfy compliance. One way to accomplish this objective has been to set the ACP at a multiple of at least twice the *expected* long-term REC premium, to encourage investment in developing projects rather than payment of the ACP. Setting prices in this manner allows for development of a market shortage price signal sufficient to incentivize investment in development activities. In New England, Class I (new renewables) ACPs range between a fixed $55 per MWh (Connecticut) and $67 per MWh (in 2016) increasing with inflation (in MA, RI and ME). Experience in the New England states with supply-demand conditions under which ACPs have been occasionally paid, shows that when states competing for marginal supply set their ACPs lower than their neighbors, sellers of RECs tend to chase the highest revenue, with REC supply going to markets with higher ACP rates, and states with lower ACPs ending up with less supply and a greater volume of ACPs paid (and, less renewables resulting in more fossil fuel generation attributable to such states' energy mixes).

Tier 2: ACPs for both legacy and maintenance tiers should be based on a strategic rationale. Here, the ACP is not intended to stimulate new investment, but rather to be sufficiently high (but not higher than needed) to (i) support continued plant operation, and (ii) attract or retain supply in the New York market, when eligible generation has other alternatives

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[1] In practice, behavior in other markets has shown that LSEs will not purchase RECs at more than some small discount to the ACP, the size of which is representative of transaction costs. In effect, if RECs are available, there is an inconvenience of buying RECs that would be avoided by just paying the ACP, that is, the transactional costs of contracting. Thus REC prices tend to be capped at this small discount to ACP.

available. Establishing ACPs for Tier 2A and Tier 2B, should consider for eligible generation the opportunity cost (revenues available to generators in competing markets); long-term contracting opportunities; and costs and risk to meet energy delivery requirements. For example, in New England, states have procurement programs for long-term contracts for energy and/or RECs from truly new renewable generation, but there are few, if any, procurement opportunities for contracts from existing renewable generators for terms exceeding one to three years,[2] and future REC prices are highly uncertain (spot prices have fluctuated between as low as $15 and as high as approaching the ACP). There are also significant costs and risks associated with exporting energy and RECs into New England, including meeting the stringent energy delivery requirements required under state's RPS programs, and foregoing capacity revenues in NYISO markets (a Massachusetts requirement).

For certain resources that are ineligible for Class I or Tier I markets in neighboring states, such as the State's fleet of small hydroelectric facilities, there are much more limited alternative opportunities for REC market revenue outside of New York State. The ACP for such resources in Tier 2B could be set at a lower rate than those having more market liquidity. In this case, the driving factors include providing a sufficient revenue to incent these generators to sell their RECs to LSEs and to allow for their continued operation. For most generators in this category, a combination of a low ACP and availability of long-term bundled PPAs to provide some revenue stability, would accomplish these objectives.

Tier 3: The ACP for ZECs to support nuclear facilities will be based upon the difference between the anticipated operating costs of the units and forecasted wholesale prices. Since there will be a limited number of qualifying ZECs in the market, DPS Staff will undertake a review of the financial information of the qualifying facilities seeking to sell ZECs. This will ensure that accurate information on expenses are known for each facility in order for the Commission to determine an ACP, which will be reviewed and reset periodically.

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[2] The lone material exception was Connecticut Public Act 13-303, Section 8, under which bundled PPAs between Connecticut electric distribution companies and two operating biomass plants were entered into pursuant to a competitive solicitation.

Appendix E: New York Generation Attribute Tracking System

Consistent with best practices and conventions used in other competitive market states with similar LSE obligations, compliance with the CES may be demonstrated through procurement of RECs and ZECs from the New York Generation Attribute Tracking System (NYGATS). This tracking system is currently under development by NYSERDA and expected to enter operation in mid-2016.

Neither the RECs used by an LSE to demonstrate compliance, nor the energy associated with such RECs, can be used or claimed for compliance with any mandate or goal in other states or for voluntary purchases (green power); in other words, double counting and double use is prohibited. Compliance will be demonstrated by the retirement of eligible RECs and ZECs associated with the LSE's load obligation.

NYGATS will be the tracking and accounting platform and its functions will include: registering and establishing accounts for generators, LSEs and other market participants interested in trading credits; issuance (or 'minting') of certificates; implementing transfers of certificates between accounts; and settlement associated with load for purposes of compliance with the individual tiers of the CES. Although NYGATS does include bulletin board functionality to list certificates for sale, it has not been designed to function as a trading platform because of the anticipated robust private market which serves this function. Instead, NYGAT's transactional role will be limited to recording and effectuating transfers of certificate ownership and disposition, and reporting. Reports will be made available to account holders that will document the certificates retired for compliance purposes, and their eligibility for each particular tier, for each applicable period.

LSEs will be required to report compliance after NYGATS reporting is available following the last trading period for the Compliance Year inclusive of an end of year balancing period. These reports provide the necessary documentation for each LSE to satisfy claims of REC and ZEC retirement for compliance.