

# Clean Energy Standard Annual Progress Report: 2017 Compliance Year

Final Report | February 2019



## **NYSERDA's Promise to New Yorkers:**

NYSERDA provides resources, expertise, and objective information so New Yorkers can make confident, informed energy decisions.

### **Mission Statement:**

Advance innovative energy solutions in ways that improve New York's economy and environment.

### **Vision Statement:**

Serve as a catalyst – advancing energy innovation, technology, and investment; transforming New York's economy; and empowering people to choose clean and efficient energy as part of their everyday lives.

# **Clean Energy Standard Annual Progress Report: 2017 Compliance Year**

*Final Report*

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Albany, NY

February 2019

## **Abstract**

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The Clean Energy Standard Progress Report is intended to summarize and analyze progress toward New York's Clean Energy Standard (CES) which mandates that 50% of the State's electricity must come from renewable energy sources by 2030 as part of a strategy to reduce statewide greenhouse gas emissions by 40% by 2030.

The report includes reporting on aggregate Load Serving Entity (LSE) compliance with Renewable Energy Standard (RES) and Zero-Emissions Credit (ZEC) obligations over the compliance period and discusses the results of other means to achieve the CES mandate, including accounting for baseline renewable and voluntary market activity.

The report allows policymakers and interested stakeholders to reference this information, along with other supporting facts, to make informed decisions on the policy's status and effectiveness as well as to inform any necessary programmatic adjustments.

## **Keywords**

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Renewable electricity, clean energy, large-scale renewables, energy programs

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## Background

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On August 1, 2016, the Public Service Commission (Commission) issued its Order Adopting a Clean Energy Standard (CES Order).<sup>1</sup> The CES is the most comprehensive and ambitious clean energy mandate in the State's history. The CES is designed to fight climate change, reduce air pollution, and ensure a diverse and reliable low-carbon energy supply by implementing the State Energy Plan goal—50% of the State's electricity must come from renewable energy sources by 2030—as part of a strategy to reduce statewide greenhouse gas emissions by 40% by 2030.<sup>2</sup>

Upon adoption, the CES included a Renewable Energy Standard (RES) and a Zero-Emissions Credit (ZEC) requirement. In July of 2018, the Commission established an Offshore Wind Standard to further contribute to the 50% renewable energy requirement.<sup>3</sup> All renewable energy consumed by end-use customers in New York State contributes to the CES, including generation supported by past, present, and future State renewable energy policies as well as voluntary renewable energy purchases.

# Executive Summary

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This annual CES Progress Report summarizes compliance with the RES and ZEC requirements for 2017 and reports on the cumulative clean energy activities in New York State that contribute to the CES mandate.<sup>4</sup>

The annual CES Progress Report is intended to inform the Commission, Department of Public Service (DPS) Staff, market participants, and other interested parties on the annual and cumulative progress toward New York's clean energy goals. Policymakers and interested stakeholders can use this information, along with other supporting facts, to make informed decisions on the policy's status and effectiveness as well as to inform any necessary programmatic adjustments. Annual progress reporting also provides actionable information to market participants, reinforcing the development of a competitive renewable energy market.

Specifically, the purpose of the CES Progress Report is as follows:

- Report on progress toward New York's CES mandate
- Summarize aggregate Load Serving Entity (LSE) compliance with RES and ZEC obligations
- Inform consumers, policymakers, and stakeholders regarding the characteristics of New York's electricity fuel mix
- Describe outcomes of state programs, regulatory obligations, and voluntary market activity
- Document trends in key measures of renewable energy market activity

For the 2017 compliance year, the contribution from renewable energy resources to meet New York's electric load rose to 28.1% from the 2014 baseline of 25.9%, an increase of 2.2%. In addition, as a result of several procurement programs, including annual solicitations for new renewables, solar incentive programs, and other State procurements, New York has a contracted pipeline of more than 10,000 GWh of renewable generation projects. Once operational, these projects are expected to deliver significant additional progress toward the achievement of the CES.

Procurement activities by NYSERDA include the issuance of the first annual RES solicitation in 2017 and the second in 2018 as well as a first solicitation in November 2018 seeking 800 megawatts (MW) or more of new projects toward the State's goal of developing 2,400 MW of offshore wind energy by 2030. By procuring rights to the Tier 1 Renewable Energy Credits (RECs) and Offshore Wind Renewable Energy Credits (ORECs), which will be created as a result of awards made under

those solicitations, NYSERDA makes funding for awarded projects possible. As is evident from experience with large-scale renewable projects, from the point of financial close it takes years to properly permit, construct, and interconnect a large-scale project. Momentum is building toward the CES mandate, and the State will see significant contributions from these projects over the coming years.

The Long Island Power Authority (LIPA) continues its initiatives with new clean energy programs planned in 2019 and expects New York's first offshore wind project to be in service at the end of 2022. The New York Power Authority (NYPA) is also coordinating with NYSERDA to implement procurement programs and announced commitments for demonstration projects for battery storage infrastructure. NYPA also currently operates the two largest hydroelectric power projects in New York State.

Renewable voluntary activity continues to expand in New York. As Community Choice Aggregation (CCA) continues to grow, this option is expected to become a significant source of voluntary renewable energy purchasing.

The first year of CES implementation was in 2017, which exposed many LSEs to the obligations imposed under the CES for the first time. LSEs met 100% of the RES obligation using a variety of methods including purchases from NYSERDA, other renewable supply, or the provision of alternative compliance payments (ACPs). LSEs met 97% of the ZEC obligation in the first compliance year. Efforts are underway by NYSERDA and DPS staff to secure compliance on the part of as many remaining LSEs as possible.

Information in the report is supported by the New York Generation Attribute Tracking System (NYGATS). The tracking system uses data provided by the New York Independent System Operator (NYISO) and other market participants, and supports New York State renewable energy initiatives, including the voluntary renewable energy market. In addition, NYGATS supports reporting of the environmental characteristics of electricity consumed in the State through the Environmental Disclosure Program (EDP)<sup>5</sup> and the CES.



# 1 New York's Clean Energy Standard

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The CES requires that 50% of New York's electricity come from renewable energy sources by 2030, starting with a 2014 baseline of 25.9% as documented in the CES Order.

All renewable energy consumed by end-use customers in New York State contributes to the CES, including energy supported by past, present, and future State renewable energy policies such as the RES, RPS, NY-Sun, Clean Energy Fund (CEF), VDER, Offshore Wind Standard, renewable energy procurements by LIPA and NYPA, and voluntary renewable energy purchases. Increasing amounts of energy efficiency is also an important contributor in achieving the CES. The ZEC requirement ensures continued operation of certain existing at-risk upstate nuclear power plants, which produce emissions-free generation and contribute to meeting the State's greenhouse gas goals. Each component is described in detail in the following sections.

## 1.1 The Renewable Energy Standard

The RES is comprised of two sub-components: Tier 1, an obligation on LSEs to support new renewable energy resources; and Tier 2, which provides support to existing, at-risk renewables.

### 1.1.1 Tier 1

To comply with the Tier 1 obligation, each LSE must demonstrate the delivery of renewable energy, from certified facilities, sufficient to meet a specified percentage of its annual load. LSEs include the investor owned utilities, energy services companies (ESCOs), jurisdictional municipal utilities, and direct customers of the NYISO.<sup>6</sup> NYPA and LIPA have agreed to participate on a voluntary basis. Each LSE's Tier 1 obligation is a function of its actual load in the subject compliance year and the Commission-determined compliance obligation percentage for that same compliance year.<sup>7</sup>

An LSE may satisfy its RES Tier 1 obligation through the acquisition and retirement of Tier 1 RECs. Tier 1 RECs can be purchased from NYSERDA, a third-party supplier, or through self-supply. Tier 1 RECs are retired by transferring them into the EDP subaccount associated with the obligated load in the LSE's NYGATS account. In addition, LSEs may make ACPs to NYSERDA or a combination of both ACPs and Tier 1 REC retirements to achieve compliance. LSEs with RES Tier 1 RECs in excess of the current year obligation may "bank" such excess compliance for use toward RES Tier 1 obligations in either of the following two years, subject to certain limitations.

RES Tier 1-eligible RECs<sup>8</sup> are those generated by renewable energy projects listed as eligible resources in Appendix A of the CES Order, with a commercial operation date on or after January 1, 2015 that meet the eligibility guidelines described in the RES Tier 1 Certification Application Instructions and Eligibility Guidelines.<sup>9</sup> Only renewable energy projects certified by NYSERDA as Tier 1 eligible can be issued Tier 1 RECs in NYGATS. Tier 1 certified renewable energy projects are publicly reported in the Operational Eligibilities<sup>10</sup> report in NYGATS.

The CES Order authorized NYSERDA, as central procurement administrator, to award long-term contracts to Tier 1-eligible generators through annual competitive solicitations for the purchase of Tier 1-eligible RECs, in the form of Tier 1 NYGATS certificates. These RECs can then be sold to obligated LSEs toward their Tier 1 compliance obligations. NYSERDA's first RES solicitation was issued June of 2017 with awards announced in March 2018<sup>11</sup>. The first RES solicitation resulted in 26 agreements, which once operational, will generate more than 3.2 million MWh of renewable electricity. The weighted average award price for this solicitation was \$21.71 per megawatt hour of production over the 20-year term of the awarded contracts. NYSERDA's second RES solicitation was issued in June 2018 with awards announced in January 2019.<sup>12</sup> The second RES solicitation resulted in 20 agreements, which once operational, will generate more than 3.8 million MWh of renewable electricity. The weighted average award price for this solicitation was \$18.77 per megawatt hour of production over the 20-year term of the awarded contracts.

Information regarding RES agreements is reported in the annual New York State Clean Energy Standard and Renewable Portfolio Standard Solicitations for Long-Term Contracts report.<sup>13</sup>

### **1.1.2 Tier 2**

Tier 2 provides financial support sufficient to maintain commercial operations at qualifying, renewable energy generation facilities that were operational prior to the Tier 1 eligibility date of January 1, 2015. The CES Order referenced the importance of maintaining the generation associated with existing facilities as a baseline toward the State's progress and established the Tier 2 program to support renewable energy generation facilities operational prior to 2004.

A March 2018 Order<sup>14</sup> refined the Tier 2 requirements for eligible resources to receive financial support over a standard contract term of three years through an order of the Commission, which requires NYSERDA to execute an agreement with the generating facility per the terms of the relevant order. To be eligible for Tier 2, the renewable energy facility must have delivered energy to New York consumers

in 2014 as part of the CES renewable energy baseline. Maintenance resources must otherwise meet the same eligibility and delivery requirements as Tier 1 resources, except for hydroelectric facilities, which are eligible only up to 10 MW. Facilities eligible for maintenance support include all non-State owned, run-of-river hydroelectric equal to or less than 10 MW, wind, and biomass direct combustion facilities, which are not currently under contract to sell the environmental attributes associated with the generated energy, provided the facility was in operation prior to January 1, 2015.

There is no LSE compliance obligation related to Tier 2 of the RES. In accordance with Commission Orders, NYSERDA has funded these agreements through its previously collected but unspent funds.<sup>15</sup> Information regarding Tier 2 agreements is reported in the annual New York State Clean Energy Standard and Renewable Portfolio Standard Solicitations for Long-Term Contracts report.<sup>16</sup>

## **1.2 Renewable Portfolio Standard**

New York State, through regulations adopted by the Commission, first enacted its RPS in 2004 with the goal of increasing the amount of renewable electricity used by consumers to 25% by 2013. In January 2010, the Commission expanded the RPS target to 30% and extended the terminal year of the program to 2015. The Commission established two tiers of resource types under the RPS. The Main Tier consisted primarily of medium- to large-scale electric generation facilities that delivered their electrical output into the power market administered by the NYISO. The Customer-Sited Tier (CST) consisted of smaller, “behind-the meter” resources, such as photovoltaic systems, fuels cells, customer-sited wind facilities, anaerobic digester gas, and similar technologies that for the most part produce electricity for use on site. The RPS also included a Maintenance Resource program, which was similar in nature to the current Tier 2 program, but with different eligibility criteria.

Under the Main Tier, similar to the RES, NYSERDA also served the role of central procurement administrator, to award long-term contracts to eligible generators through periodic competitive solicitations for the purchase of the associated RECs. A portion of these projects are Tier 1 eligible, and therefore, NYSERDA sells the associated RECs in a manner similar to other Tier 1 RES projects. Information regarding RPS agreements is reported in the annual New York State Clean Energy Standard and Renewable Portfolio Standard Solicitations for Long-Term Contracts report.<sup>17</sup>

NYSERDA's continued support for CST renewables is now encompassed by the CEF, which includes the NY-Sun program for solar resources. Separate reporting<sup>18</sup> regarding the installed renewable energy generation capacity supported through the CEF can be found on NYSERDA's website. The annual NY-Sun Performance Report<sup>19</sup> contains a holistic representation of historic and ongoing support for customer-sited solar.

### **1.2.3 Baseline Generators**

A Staff White Paper, which preceded the CES Order, cited data from the EDP regarding the amount of renewable energy consumed in the State in 2014 to establish a baseline amount of renewable generation serving New York's load to measure progress. NYGATS is now used to calculate the Statewide Fuel Mix for EDP, referred to as the New York System Mix.

The generation associated renewable energy facilities that delivered energy to New York consumers in 2014 is referred to as the CES Renewable Energy Baseline or baseline.<sup>20</sup> This baseline includes NYPA hydropower assets, Main Tier and CST facilities, RPS Maintenance Resources, imported renewable energy, voluntary renewable energy purchases, and other independently owned renewable energy generation resources. The renewable energy baseline in 2014 was calculated as 41,296 GWh, or 25.9% of the 2014 EDP Statewide Fuel Mix.

Baseline facilities that generate RECs which are retired in New York, are counted toward CES achievement. Due to the nature of energy market transactions across borders, the 2017 baseline renewable energy may include or exclude imported renewable generation that was part of the 2014 baseline calculation. Differences between years may also be attributable to the variations in climatic conditions in a given year as generation from renewable resources is weather-dependent.

Additionally, some baseline renewable resources have the opportunity to export energy and the associated attributes into adjacent markets. Policymakers will continue to monitor the degree of baseline resource exports. Accordingly, this report summarizes and tracks baseline generation by technology over the years of the CES, including the amount of baseline renewable energy exported.

### **1.3 Value of Distributed Energy Resources**

In 2017, the Commission established a mechanism to transition to a new way to compensate distributed energy resources (DER). This mechanism, called the Value of Distributed Energy Resources (VDER), established tariffs to replace the compensation mechanism of net energy metering (net metering or NEM). The transition is intended to encourage the location, design, and operation of DER in a manner that maximizes benefits to the customer, the electric system, and society while also ensuring the development of clean generation needed to meet the necessary and aggressive goals embodied in the CES. Under VDER, the compensation paid to eligible generation resources is based on a set of value elements referred to as the Value Stack. One component of the Value Stack is compensation for the Environmental Value of the generation. This value is based on the higher of the latest Tier 1 REC procurement price published by NYSERDA or the Social Cost of Carbon (SCC).<sup>21</sup> Since the utility companies that must implement VDER tariffs are providing Environmental Value, the Commission ordered that the Tier 1 RECs created by DER would flow to the utility company and be eligible for use toward that utility's Tier 1 compliance obligations.<sup>22</sup>

While many DER installations have been supported by New York State through CST incentive programs or NY-Sun, NYSERDA makes no claim to the environmental attributes of that generation. Through Commission action in the VDER proceeding, NYSERDA relinquished all rights to any environmental claims or RECs for NY-Sun and RPS CST projects to which it may have made claims under previous policies.<sup>23</sup>

### **1.4 Offshore Wind Standard**

New York State is actively pursuing the development and procurement of offshore wind as an additional mechanism toward satisfaction of the CES. In 2017, Governor Andrew M. Cuomo announced a commitment to support the installation of up to 2,400 MW of offshore wind capacity by 2030. NYSERDA subsequently released the New York Offshore Wind Master Plan and Offshore Wind Policy Options Paper to provide a roadmap to fulfill the Governor's directive through cost-effective and responsible offshore wind development. In July 2018, the Commission issued an Order<sup>24</sup> adopting an Offshore Wind Standard through which the statewide offshore wind capacity goal of 2,400 MW would be achieved, authorizing NYSERDA to conduct a first phase of offshore wind solicitations to procure, approximately 800 MW of offshore wind in 2018 and 2019.

NYSERDA issued its first Offshore Wind Request for Proposals in November of 2018.<sup>25</sup> NYSERDA seeks to procure ORECs from awarded facilities. In future years, the CES Progress Report will include data regarding offshore wind's contributions to the achievement of the CES.

## **1.5 NYPA and LIPA**

LIPA and NYPA have committed to adopt renewable targets that will achieve the 50% by 2030 mandate. According to the 2018 Public Service Enterprise Group (PSEG) Long Island Utility Annual Update, the utility is positioned to comply with New York's targets through past and future investments in offshore wind, energy efficiency and new renewable energy.<sup>26</sup>

To date, LIPA has undertaken numerous initiatives to secure a cleaner and more affordable energy future for Long Island. LIPA has invested more than \$1.4 billion in energy efficiency and clean energy resources over the last 10 years, reducing Long Island's peak by more than 585 MW. Among the clean energy investments made by LIPA on Long Island include New York's three largest utility-scale solar projects, totaling 92 megawatts; largest commitment to utility scale storage, with 80 megawatt-hours deployed; largest commitment to clean fuel cell technology, more than 40 megawatts; most vibrant residential solar program, with more than 44,000 customers; and New York's first offshore wind farm—the 130 megawatt South Fork Wind Farm,<sup>27</sup> which will be in service by the end of 2022. Since 2012, LIPA has issued a series of Feed-In Tariff<sup>28</sup> solicitations for 170 MW of solar and 60 MW of non-solar renewable generation assets interconnected at the distribution level.

LIPA also has a number of new clean energy programs planned for 2019 that include integrating a new utility-scale storage program to cost-effectively defer the need to build new distribution substations, while enhancing clean energy storage capacity; and offering a residential and commercial customer storage program to provide an incentive to third-party aggregators who can use behind-the-meter storage to provide load relief to the electric grid on peak days.

NYPA operates the largest hydroelectric power projects in New York—the 2,441 MW Niagara Power Project in Lewiston and the 800 MW St. Lawrence-Franklin D. Roosevelt Power Project in Massena—and owns and operates more than 1,400 circuit miles of transmission lines around the State. NYPA, in close coordination with its sister agency NYSERDA, is focused on implementing a variety of programs and initiatives to help realize the ambitious goals of the CES.

NYPA provides power to State and local governments with comprehensive energy portfolio options to meet individual customer needs while advancing the overall energy goals of the state. NYPA is collaborating closely with its customers to achieve the CES goals in ways that best meet their varying needs. As customer contracts are renewed, NYPA is including provisions to allow for recovery of costs associated with the CES and expects that the vast majority of customer contracts will include CES provisions by 2021. NYPA is taking the actions necessary to support the growth of renewables in New York State and is committed to achieving the Governor's 50% by 2030 goal. In addition to leading efforts to advance large-scale renewables, distributed renewables, energy efficiency, energy storage and electric vehicle infrastructure with its new EVolve initiative. This CES-driven agenda includes announcements made this year for commitments of hundreds of millions of dollars toward the deployment of electric vehicle infrastructure around the State and critical demonstration projects for battery storage infrastructure.

## **1.6 Voluntary Renewable Energy Activities**

Opportunities for consumers of all sizes to purchase renewable energy voluntarily emerged during the earliest days of electric industry restructuring in many states, including New York. During the years of New York's RPS program, there was a small but consistent contribution from voluntary market activities to the State's renewable energy goals. The CES Order contemplated voluntary contributions from renewable energy to continue to provide a portion of the renewable energy supply to meet the CES, above and beyond LSE compliance obligations under the RES. Voluntary purchases can be made by both large and small end users, and may derive from green tariffs offered by utilities, renewable energy products offered by competitive LSEs, or customized solutions coordinated directly between large end users and renewable energy generators. Corporate interest in renewable energy purchases increased in recent years on a global basis and it is expected that voluntary market activities in New York State will increase throughout the course of the CES.<sup>29</sup> Customers who choose to participate in behind-the-meter renewable generation projects are another example of a voluntary activity that increases the amount of renewable energy serving New York's electricity needs.

In 2016, New York's first Community Choice Aggregation (CCA) program, Sustainable Westchester, signed contracts for electricity supply for communities in Westchester County. CCA gives a municipality the ability to pool their electrical load in order to negotiate supply on behalf of residents, businesses, and municipal accounts. CCA also allows a municipality to design a program that reflects local preferences

and needs, including a preference for cleaner power sources. At present, more than 70 municipalities passed legislation to enable CCA and the Commission authorized four CCA administrators to work with these municipalities. As CCA continues to grow, it is expected to become a significant source of voluntary renewable energy purchasing in New York.

## **1.7 Zero Emissions Credit Requirement**

The CES also includes an LSE ZEC requirement. The ZEC compliance year occurs from April 1st through March 31st of each year. The associated LSE ZEC obligation ensures continued operation of certain existing at-risk upstate nuclear power plants, which produce emissions-free generation and contribute to meeting the State's greenhouse gas goals. While the ZEC obligation is part of the CES, the generation represented by ZECs is not counted toward the renewable mandate.

While the RES mandates compliance through the retirement of Tier 1 RECs or the provision of ACPs, ZEC obligations are satisfied exclusively through monetary payments to NYSERDA. ZEC supply is largely fixed according to a maximum quantity included in the CES Order, and each LSE's annual ZEC obligation is defined in proportion to its load served in a given compliance year. The ZEC price is administratively determined, by formula, on an annual basis and is fixed for all LSEs. Since the program's supply and demand are largely static, there is no need for ongoing adjustments or flexibility mechanisms. As a result, there is no ACP option for fulfilling the ZEC obligation, and ZECs may not be banked or traded.

## **1.8 Energy Efficiency Targets**

Governor Cuomo underscored New York's commitment to energy efficiency in his 2018 State of the State address, while recognizing much work remains to realize the full potential of energy efficiency for New Yorkers. Meeting the new energy efficiency target will deliver nearly one-third of the greenhouse gas emissions reductions needed to meet New York's climate goal of 40% reduction by 2030. New York's investor-owned utilities are called on to achieve more in both scale and innovation through their energy efficiency activities.



On December 13, 2018, the Commission issued an Order<sup>30</sup> Adopting Accelerated Energy Efficiency Targets. The Commission's order adopts 31 Tbtu of additional site energy reduction by the State's utilities above existing efficiency goals and toward the achievement of a 2025 target. The new energy efficiency target for investor-owned utilities will more than double utility energy efficiency progress by 2025, reducing the State's energy consumption by the equivalent of fueling and powering 1.8 million homes.

While NYGATS contains data on total load and changes can be observed through annual reporting, these changes may not be related to energy efficiency activities alone. Progress toward the achievement of energy efficiency goals will be provided under NYSERDA's CEF reports and through the utility companies' investments in energy efficiency.

## 2 System and Timeline

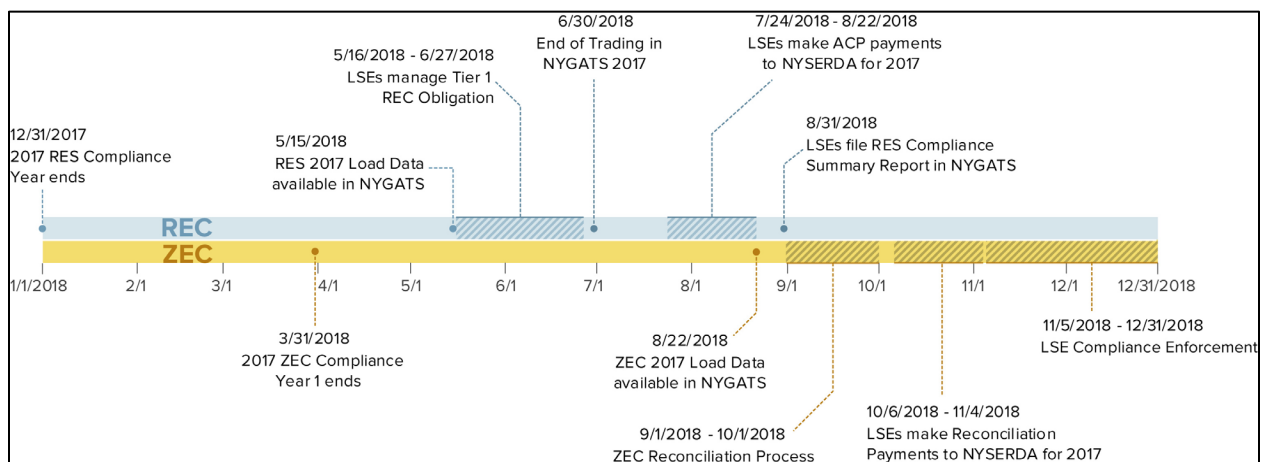
### 2.1 NYGATS

NYGATS, using data provided by the NYISO and other market participants, supports New York State renewable energy initiatives, including the voluntary renewable energy market. It also supports reporting of the environmental characteristics of electricity consumed in the State through the EDP<sup>31</sup> and the CES.

NYGATS is an online certificate-tracking system that records information about electricity generated, imported, and consumed within New York State. Using unique serial numbers, it can issue, track, and manage energy attribute certificates and RECs. NYGATS prevents double counting of RECs, provides public reports, and records a full audit trail of all transactions to support the integrity of the RECs issued and held in the system. Registered NYGATS users can trade, retire, or verify and substantiate ownership of RECs to support compliance or voluntary claims. Certificates can be bundled and traded with megawatt-hours of energy, but this is not a requirement in NYGATS.

All energy generated in New York, imported into New York, or exported out of New York is tracked and verified through NYGATS. NYGATS, therefore, creates and tracks certificates for all the renewable energy production counted toward the achievement of the CES. NYGATS also contains data on the load served by New York LSEs and is used as the basis for achieving and verifying LSE compliance with CES obligations. NYGATS is the primary data source for this report and much of the source data is publicly available on the NYGATS website.<sup>32</sup> Figure 1 provides key dates for both NYGATS timelines.

**Figure 1. CES and NYGATS Timeline**



### **3 2017 Progress Toward New York’s Policy Goals**

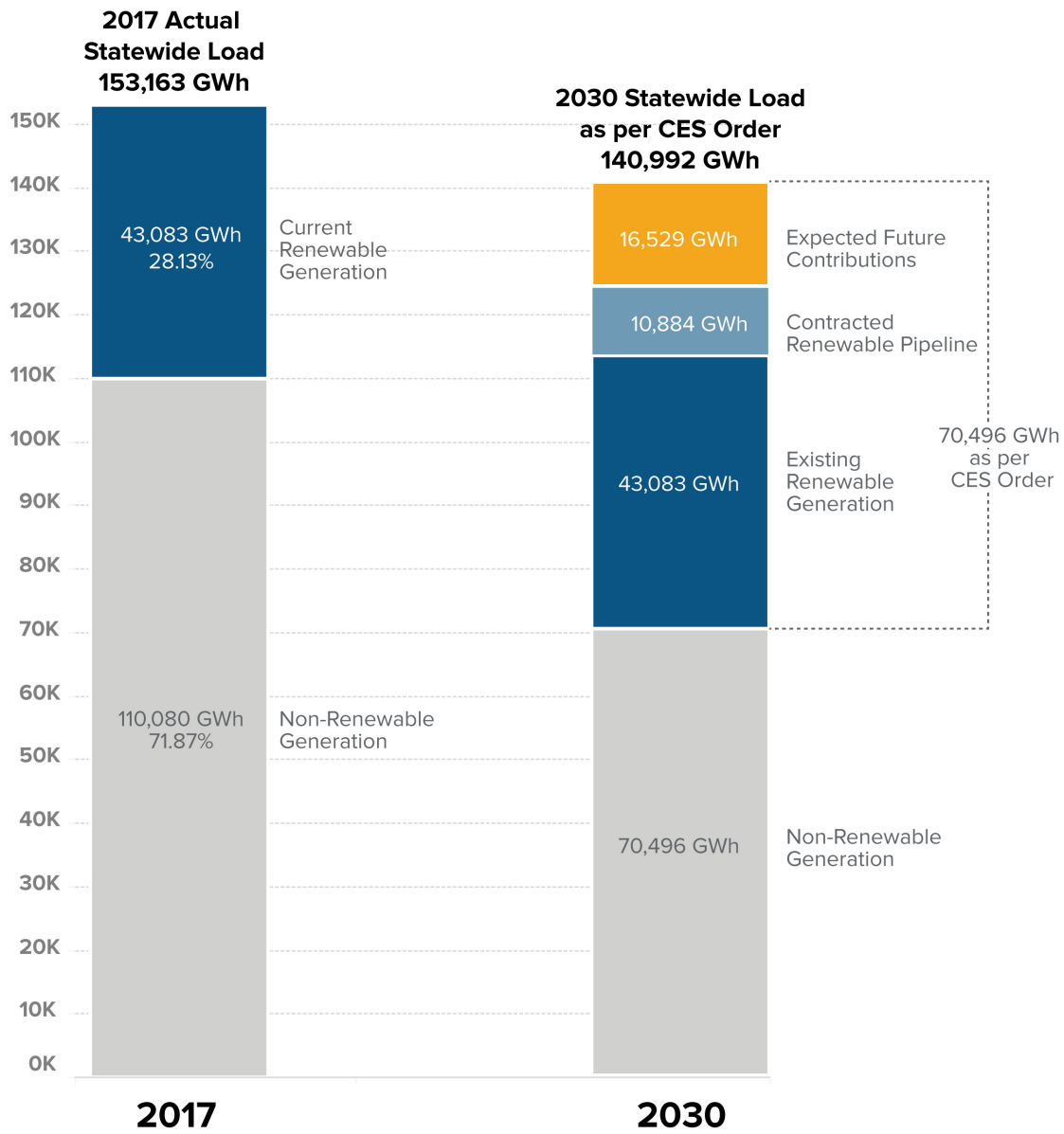
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Progress toward the CES mandate is measured by tracking the additional renewable energy contributing to the New York System Mix throughout the years of the CES. In 2017, the contribution from renewable energy resources to meet New York’s electric load rose to 28.1% from the 2014 baseline of 25.9%, an increase of 2.2%.

Figure 2 depicts the generation sources (including non-renewable and renewable) serving New York State’s electric load in 2017 plus the expected progress toward the State’s 2030 goal. Longer term progress includes over 10,000 GWh of generation associated with New York’s contracted renewable pipeline resulting from several procurement programs, including annual solicitations for new renewables, solar incentive programs, and other State procurements. Once operational, these projects are expected to deliver significant additional progress toward the achievement of the CES.

The remaining expected future contributions toward CES achievement will be met with renewable contributions from large-scale renewables, both land-based as well as offshore, as well as distributed energy resources.

**Figure 2. Actual and Future Projections Toward CES Mandate (GWh)**

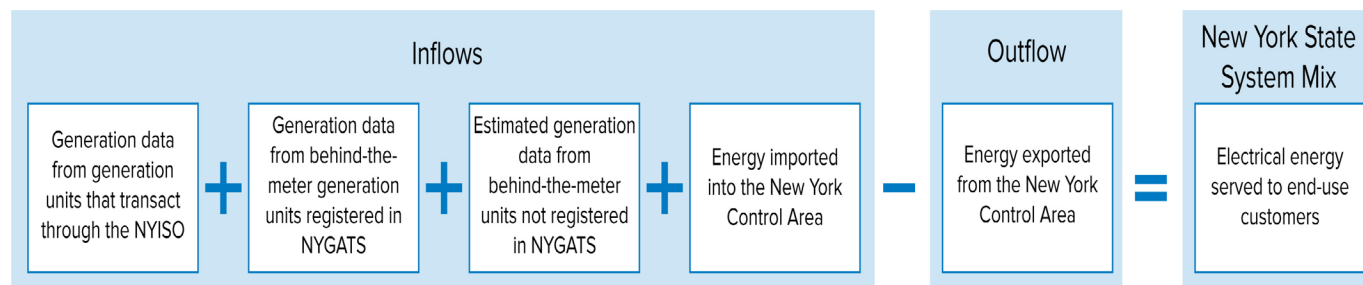


The following sections present more detailed information regarding the energy that served electricity consumers in the State in 2017.

### 3.1 Statewide Fuel Mix for Electricity Generation

Annually, NYGATS is used to compute the average characteristics of the energy consumed in New York (New York System Mix). The New York System Mix represents the electric energy served to end-use customers and is based upon the inputs shown in Figure 3, which include both inflows and outflows of energy.

**Figure 3. New York System Mix Calculation**

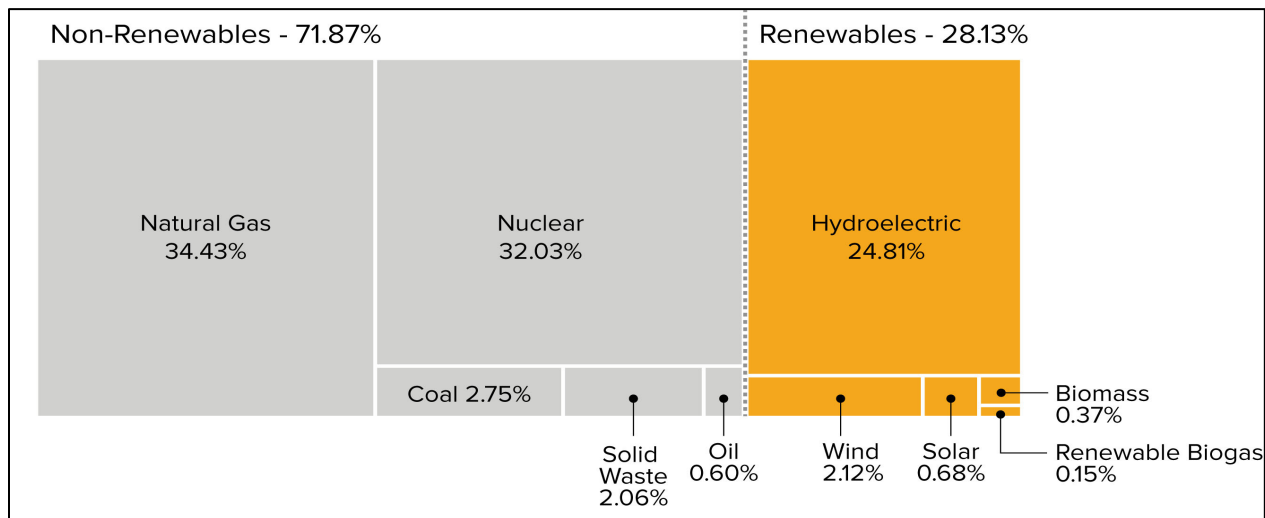


Using these inputs, NYGATS calculates the average amount of each fuel type used to generate electricity and the associated average emissions. Fuel type and emissions information is then matched to the generation used by electricity customers in New York. The output of the New York System Mix represents the average characteristics of the electricity consumed in the State of New York in a given year. This is different from, but inclusive of, the unique mix that electricity providers deliver to their customers. The New York System Mix can be used to track progress toward State energy and emissions goals, and assess the performance of electricity providers, generators, and policies.

Figure 4 summarizes the 2017 New York System Mix from NYGATS, displaying data on the types and quantities of fuels used to supply New York State’s electric load in 2017. The New York System Mix uses NYGATS certificate data for energy that served New York’s load in 2017, including certificates that were retired for voluntary or compliance purposes or banked for future use. Renewable energy resources contributed 28.1% of the electrical energy consumed in the State in 2017.

**Figure 4. New York System Mix, 2017**

Source: NYGATS



### 3.2 Progress toward CES Mandate

New York’s progress toward the CES mandate is summarized in Table 1, including sources of renewable energy supply (by eligibility) and total electric load. The quantities represent all compliance year renewable energy supply settled in New York State, through NYGATS, and considers all renewable energy imports and exports.

**Table 1. Summary of New York System Mix, 2014 versus 2017**

Source: NYGATS

	2014	2017
Generation from Baseline Renewable Energy (MWh)	41,295,663	42,964,344
Generation from Tier 1 Energy (MWh) <sup>a</sup>	N/A	124,373
Total Renewable Energy (MWh)	41,295,663	43,082,717
Total Load (MWh) <sup>b</sup>	159,146,663	153,162,582
% Renewable Energy serving Load (%)	25.9%	28.1%

<sup>a</sup> Tier 1 Energy includes generation from Fuel Cells that are fired by Natural Gas as this technology is eligible under Tier 1. Since these generation projects are fired with Natural Gas their MWhs are reported as Natural Gas in the New York System Mix, which is consistent with the fuel reporting in the 2014 Statewide Fuel Mix. Therefore, the Baseline Renewable Energy plus Tier 1 Energy will not equal the Total Renewable Energy.

<sup>b</sup> Includes LSEs, Municipal Utilities, and Direct Customers. Pursuant to the NYGATS Operating Rules, load is calculated by using NYISO version 2 settlement data and adding generation from load modifiers utilized by distribution utilities. The load modifier data adjusts the total load as well as the total load served by the LSE utilizing the load modifier(s). The adjusted total load served by each LSE is then divided by the adjusted total statewide load to determine the percentage of total load served by each LSE. The total quantity of renewable energy serving New York State load includes both baseline and Tier 1 energy supply.

Figure 5 breaks down the renewables portion of the 2017 New York System Mix by the type of activity. This figure illustrates that baseline renewables, which includes generation from NYPA hydroelectric<sup>33</sup> facilities, and imported renewables compromise the largest amount of renewable energy in the 2017 New York System Mix.

**Figure 5. Renewables within 2017 New York System Mix**

Source: NYGATS

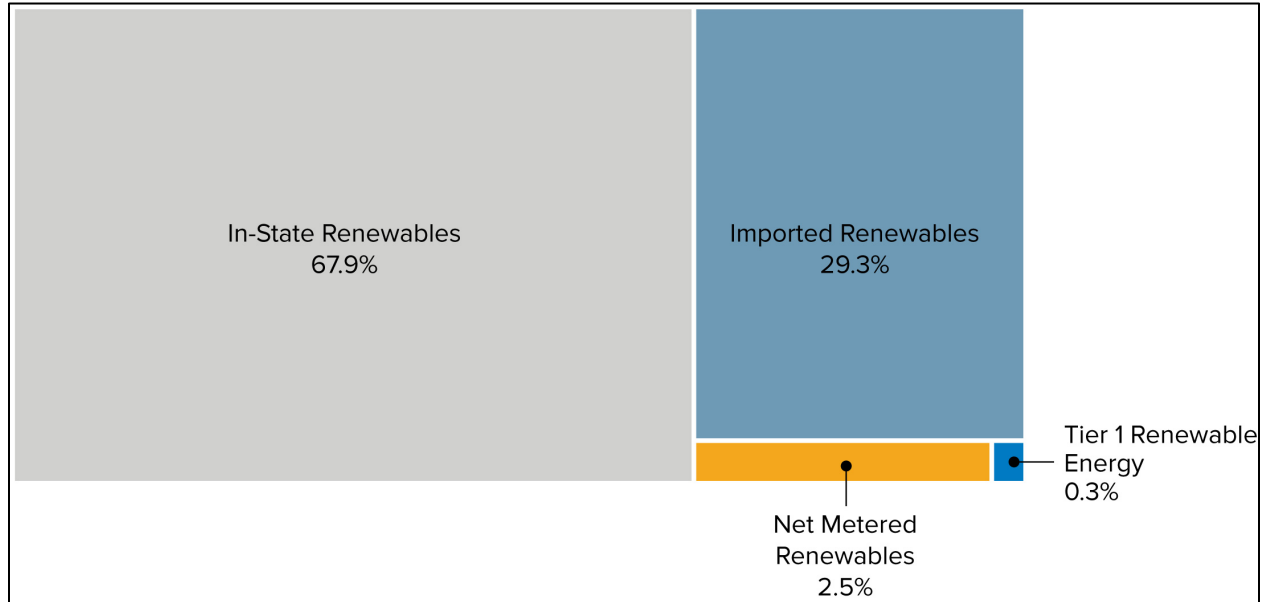


Table 2 shows renewable energy in the New York System Mix by technology as well as the differential contribution between 2014 and 2017. Contributions from hydroelectric and solar technologies increased while biomass, renewable biogas, and wind decreased.

**Table 2. New York System Mix Renewable Energy by Technology**

See endnotes section for more information.<sup>34</sup>

Source: NYGATS

Fuel Type	2014 MWhs	2017 MWhs	MWh change
Biomass	609,293	561,816	-47,477
Hydroelectric	35,834,762	37,995,574	2,160,812
Renewable Biogas	394,314	236,970	-157,344
Solar	681,610	1,045,489	363,879
Wind	3,775,684	3,242,868	-532,816
<b>Total</b>	<b>41,295,663</b>	<b>43,082,717</b>	<b>1,787,054</b>

### 3.3 Composition of Baseline Renewable Energy

Table 3 shows the contribution from baseline renewable energy generators by technology and the change between 2014 and 2017. For 2017, the contribution from the baseline renewable energy generators includes all the non-Tier 1 certified energy in the New York System Mix and demonstrates that the contribution from baseline renewable energy resources has increased from 2014 to 2017.<sup>35</sup>

**Table 3. Baseline Generation Contribution to New York System Mix**

(Excludes Tier 1 Renewable Energy).<sup>36</sup>

Source: NYGATS

	2014 (CES White Paper)		2017 (New York System Mix)	
	CES Baseline MWhs	Percentage <sup>a</sup>	Non-Tier 1 MWhs	Percentage <sup>b</sup>
Coal	7,205,000	4.5%	4,219,310	2.8%
Natural Gas	58,454,000	36.7%	52,722,227	34.5%
Nuclear	49,409,000	31.0%	49,062,427	32.1%
Oil	708,000	0.4%	911,126	0.6%
Solid Waste	2,075,000	1.3%	3,158,775	2.1%
<b>Non-Renewable Energy</b>	<b>117,851,000</b>	<b>74.1%</b>	<b>110,073,865</b>	<b>71.9%</b>
Biomass	609,293	0.4%	561,816	0.4%
Hydroelectric	35,834,762	22.5%	37,951,145	24.8%
Renewable Biogas	394,314	0.2%	236,628	0.2%
Solar	681,610	0.4%	1,005,028	0.7%
Wind	3,775,684	2.4%	3,209,727	2.1%
<b>Renewable Energy</b>	<b>41,295,663</b>	<b>25.9%</b>	<b>42,964,344</b>	<b>28.1%</b>
<b>Total</b>	<b>159,146,663</b>	<b>100.0%</b>	<b>153,038,209</b>	<b>100.0%</b>

<sup>a</sup> Numbers may not add up to 100% due to rounding.

<sup>b</sup> Numbers may not add up to 100% due to rounding.



### 3.3.1 Baseline Renewable Energy Exports

Table 4 displays in aggregate the number of RECs exported from baseline renewable generation units located in New York State during the compliance year. Since there was no tracking system in place at the time the CES baseline was calculated, a comparison cannot be made to the level of renewable energy exports that occurred in the CES baseline year of 2014.

**Table 4. Renewable Energy Exports by New York Generators - Installed Prior to 1/1/2015.**

*Source: NYGATS*

<b>Technology</b>	<b>2017 REC Exports</b>
Hydroelectric <sup>a</sup>	63,405
Renewable Biogas	572,505
Wind	1,001,874
<b>Total Baseline Renewable Energy Exports</b>	<b>1,637,784</b>

<sup>a</sup> Number excludes exports from NYPA hydroelectric facilities

## 4 Tier 1

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### 4.1 Tier 1 Annual Compliance Summary

Table 5 summarizes the results of the NYSERDA and DPS review of annual LSE compliance filings for 2017. Tier 1 compliance mechanisms are summarized, in aggregate, for all LSEs. The total number of obligated LSEs, the number of LSEs making ACP payments, and the associated percentage of the aggregate statewide LSE obligation is also shown. A full list of LSEs active during the year can be obtained through NYGATS, via the EDP Label Reports.<sup>37</sup>

The data is inclusive of NYSERDA Tier 1 REC activities. In 2017, NYSERDA purchased 41,891 Tier 1 RECs through its long-term contracts. These 2017 Tier 1 RECs are sold to obligated LSEs toward their Tier 1 compliance; and LSEs have purchased 27,803 vintage 2017 Tier 1 RECs to date.

As of the date of this report's issuance, 100% of the 2017 RES obligation was met by a combination of Tier 1 RECs and ACPs.

**Table 5. Summary of 2017 Tier 1 RES Compliance**

<b># of LSEs with RES Tier 1 Obligations</b>	<b>160</b>
Tier 1 Obligated Load (MWhs)	153,162,582
Tier 1 Obligation Percent	0.035%
Aggregate Tier 1 Compliance Obligation (MWhs)	53,601
2017 Tier 1 RECs Used for Compliance	40,851
2017 VDER Tier 1 RECs Used for Compliance	1
Imported Tier 1 RECs Used for Compliance	0
Banked Tier 1 RECs Used for 2017 Compliance	0 <sup>a</sup>
Banked VDER Tier 1 RECs Used for 2017 Compliance	0
Total Tier 1 RECs for 2017 Compliance	40,852
Number of ACPs for 2017 Compliance	12,811
<b>Total 2017 Compliance</b>	<b>53,663<sup>b</sup></b>
<b>Total Percent Compliance</b>	<b>100%</b>

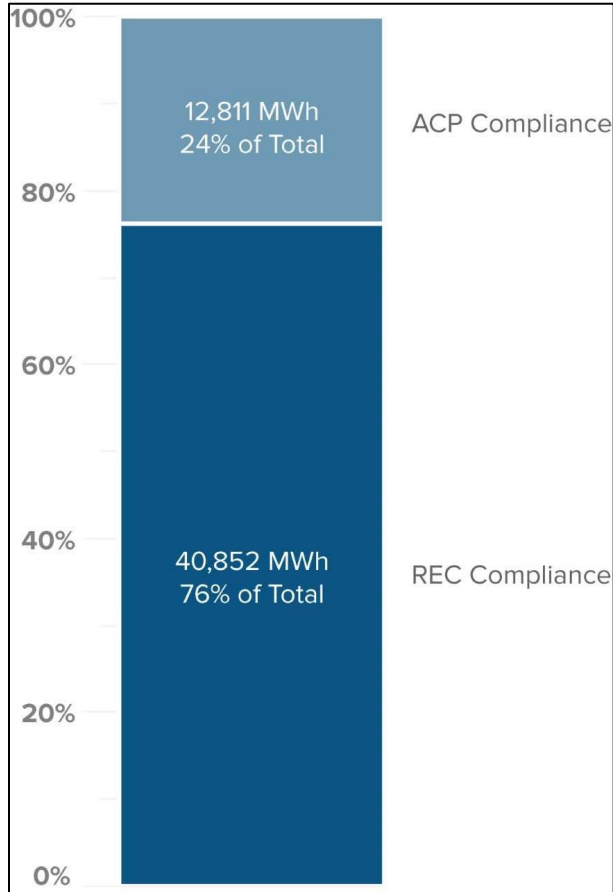
<sup>a</sup> 2017 is the first year of RES Tier 1 compliance; no banked RECs are available from prior periods.

<sup>b</sup> Tier 1 RECs were purchased by LSEs and retired for RES compliance in excess of their obligation.

Figure 6 displays the 2017 compliance pathways including the provision of Tier 1 RECs and ACPs.

**Figure 6. Tier 1 RES Compliance**

Source: NYGATS

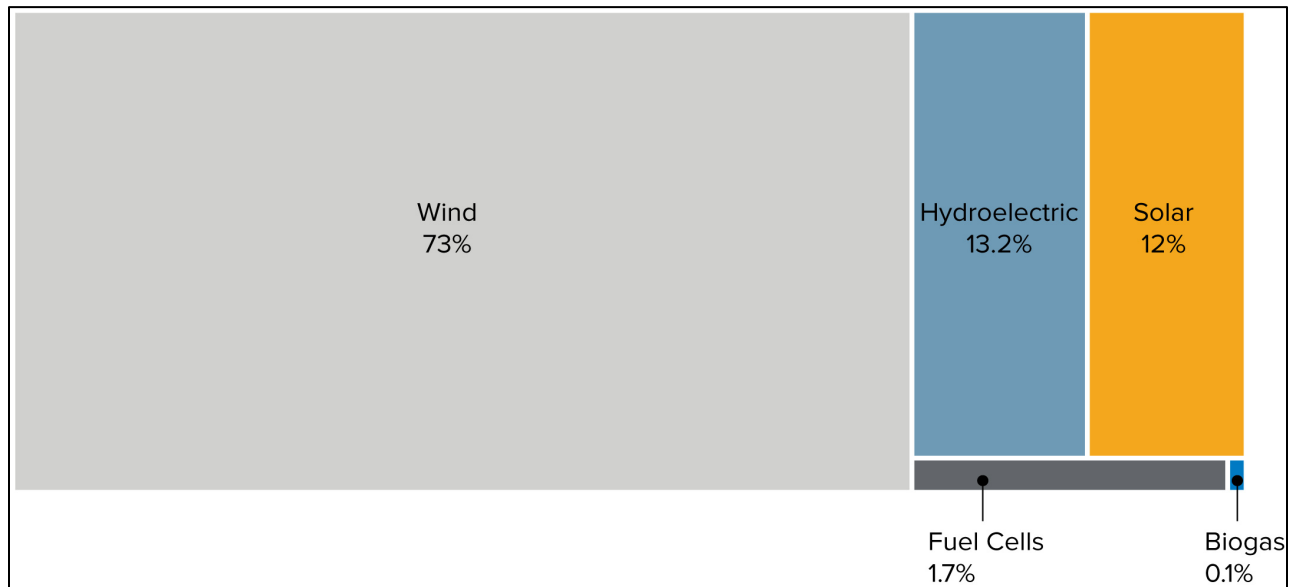


## 4.2 Tier 1 RECs by Technology

Figure 7 summarizes Tier 1 RECs created in 2017 by technology. This figure includes Tier 1 RECs that were created in New York but exported. There were no imported Tier 1 RECs in 2017.

**Figure 7. 2017 Tier 1 RECs by Technology**

Source: NYGATS



### 4.3 Tier 1 REC Banking Activity

Commission orders afford LSEs and NYSERDA the option to bank excess Tier 1 RECs from the current compliance year for use in two subsequent compliance years. Banking is a flexibility mechanism intended to increase market liquidity and reduce REC price volatility—by allowing renewable energy surpluses (if applicable) to be used for compliance in a future year. Banking is limited to Tier 1 RECs and only by NYSERDA or obligated LSEs who are compliant with the RES for all previous compliance periods. To be eligible for banking, excess NYGATS certificates must not have been previously used for compliance with the RES or transferred to other parties. The number of RECs an LSE may bank is capped at 60% of the current compliance year’s REC obligation. However, the Commission (in response to a Joint Utilities Petition) suspended the 60% banking cap for VDER resources through 2022.<sup>38</sup>

Table 6 summarizes Tier 1 RECs, which are banked by category, including LSE banked RECs, VDER Tier 1 banked RECs, and NYSERDA’s Tier 1 banked balance. Tier 1 RECs, which remain unsold from NYSERDA quarterly sales, are banked and then made available in subsequent NYSERDA sale events. LSEs with excess Tier 1 RECs must bank them prior to the end of certificate trading in NYGATS; for 2017 vintage RECs, trading closed on June 30, 2018.

**Table 6. Tier 1 REC Banking Summary***Source: NYGATS*

<b>2017</b>	
<b>LSE Tier 1 REC Banking (Non-VDER Tier 1 RECs)</b>	
Aggregate LSE Tier 1 Bank Balance, 1/1/2017	0
Banking Withdrawal	0
Banking Addition	36,010
Aggregate LSE Bank Balance, 6/30/2018	36,010
<b>VDER Tier 1 REC Banking</b>	
Aggregate balance of VDER Tier 1 RECs banked, 1/1/2017	0
VDER Banking Withdrawal	0
VDER Banking Addition	0
Aggregate balance of VDER Tier 1 RECs banked, 6/30/2018	0
<b>NYSERDA Tier 1 REC Banking</b>	
NYSERDA Bank Balance, 1/1/2017	0
NYSERDA Bank Balance, 6/30/2018	14,088
<b>Overall Balance of Banked Tier 1 RECs</b>	<b>50,098</b>

## 5 Compliance with ZEC Obligations

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At the time of this report's issuance, 97% of the ZECs have been purchased by LSEs from NYSERDA to meet their ZEC obligation, and efforts are underway to secure compliance on the part of as many of the remaining LSEs as possible. Table 7 summarizes the progress that has been made in meeting the ZEC obligations under the CES.<sup>39</sup>

**Table 7. Summary of 2017 ZEC Compliance**

<b>ZEC Compliance Year</b>	<b>2017</b>
Maximum ZECs to be Purchased (MWh)	27,618,000
ZEC Generated (MWh)	27,618,000
Total Obligated Load (MWh) <sup>40</sup>	153,867,487
Total ZECs Purchased for 2017 Compliance	26,779,559
Aggregate Current Compliance with ZEC Obligation (percent)	97%

## 6 Contribution of Voluntary Renewable Energy Activities to CES Progress

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The CES Order recognized that many market actors are motivated to purchase renewable energy beyond what is required by regulatory compliance. Such voluntary market activity is encouraged and tracked and does not alter existing LSE obligations.

Table 8 reports on the retirement of 2017 RECs for voluntary purposes. These voluntary actions include, but are not limited to, Green Power Products sold by LSEs, Customer-sited DER Generation Retirements, and Corporate or Individual Retirements. NYGATS account holders may retire RECs without the associated energy for corporate or individual renewable energy claims. The reported Corporate and Individual Retirements only include RECs retired with the associated energy; REC-only retirements have been excluded as these do not contribute to CES Progress.

LSE voluntary activity reported below reflects REC retirements by LSEs for EDP label purposes. The total does not include the retirement of RECs from NYPA hydroelectric facilities made by NYPA and municipal utilities that have long term hydropower contracts with NYPA or Tier 1 RECs retired for compliance toward RES obligations. The resulting number represents RECs retired by LSEs for retail renewable energy products delivered to customers in 2017.

The customer-sited DER retirements represents RECs from NEM projects that were retired in NYGATS. Generation from customer-sited DER projects that are not registered in NYGATS is estimated annually using information from the New York State Standardized Interconnection Requirements (SIR) Inventory reporting<sup>41</sup>. NYSERDA enters this information into NYGATS and retires the resulting RECs on behalf of the project owner.

**Table 8. Voluntary Activity in NYGATS**

*Source: NYGATS*

	<b>2017 RECs</b>
Total Voluntary Activity in LSE EDP Subaccounts	4,019,475
Corporate or Individual Retirements	188,279
Customer-sited DER Retirements	1,114,207
Non-Tier 1 RECs Banked	2,601,389



## 7 Key References and Links

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The Clean Energy Standard Orders, reports, and filings can be found on NYSEERDA's website:

- [nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Important-Orders-Reports-and-Filings/Filings-Orders-and-Reports](https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Important-Orders-Reports-and-Filings/Filings-Orders-and-Reports)

Information on the Renewable Portfolio Standard, the precursor to the CES and past Main Tier solicitations can be found on the following NYSEERDA websites:

- [nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Portfolio-Standard/RPS-Documents](https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Portfolio-Standard/RPS-Documents)
- [nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Portfolio-Standard/Past-Main-Tier-Solicitations](https://www.nyserda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Portfolio-Standard/Past-Main-Tier-Solicitations)

# Endnotes

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- 1 Case 15-E-0302, Proceeding to Implement a Large-Scale Renewable Program and a Clean Energy Standard, Order Adopting a Clean Energy Standard (issued and effective August 1, 2016). (CES Order) See Appendix A for eligible technologies.
- 2 In Governor Cuomo’s 2019 State of the State, he proposed the Green New Deal, a nation-leading clean energy and jobs agenda that puts New York on a path to carbon neutrality through a globally unprecedented ramp-up of renewable energy including doubling the state’s distributed solar goal from 3,000 megawatts to 6,000 megawatts by 2025, obtaining 70 percent of its electricity from renewables by 2030, increasing New York’s offshore wind target to 9,000 megawatts by 2035, and achieving 100 percent of its electricity from clean sources by 2040. Each of these proposals will likely lead to implementation proceedings at the New York State Public Service Commission, which may amend the requirements currently stated in Orders and described in this document.”
- 3 Case 18-E-0071, In the Matter of Offshore Wind Energy, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement (issued and effective July 12, 2018).
- 4 The requirement for this CES Progress Report was set forth in the CES Order; subsequent CES Implementation plans further defined the content and structure, along with reporting requirements. Case 15-E-0302, supra, Order Approving Phase 1 Implementation Plan (issued February 22, 2017), Order Approving Phase 2 Implementation Plan (issued November 17, 2017), Order Approving Phase 3 Implementation Plan (issued December 14, 2018).
- 5 <http://www3.dps.ny.gov/W/PSCWeb.nsf/0/502EF210A0D15B2885257687006F39D8>
- 6 CES Order, p. 14
- 7 The CES Order set the LSE obligation to purchase Tier 1 RECs through 2021. These obligations were updated in the approved Phase 2 Implementation Plan. Case 15-E-0302, Proceeding to Implement a Large-Scale Renewable Program and a Clean Energy Standard, Order Approving Phase 2 Implementation Plan (issued November 17, 2017).
- 8 Renewable Energy Certificates include any and all reductions in harmful pollutants and emissions, such as carbon dioxide and oxides of sulfur and nitrogen to catalog and recognize environmental attributes of generation.
- 9 <https://www.nyscrda.ny.gov/All-Programs/Programs/Clean-Energy-Standard/Renewable-Generators-and-Developers/RES-Tier-One-Eligibility/Eligibility>
- 10 [https://nygats.ny.gov/ng/Report/getdto\\_view\\_Report\\_PublicOperationalEA](https://nygats.ny.gov/ng/Report/getdto_view_Report_PublicOperationalEA)
- 11 <https://www.nyscrda.ny.gov/About/Newsroom/2018-Announcements/2018-03-09-Governor-Cuomo-Announces-Formal-Request-for-New-York-Exclusion-From-Offshore-Drilling>
- 12 <https://www.nyscrda.ny.gov/About/Newsroom/2019-Announcements/2019-01-18-NYSERDA-Announces-Details-for-20-Large-Scale-Renewable-Energy-Projects>
- 13 [nyscrda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2017-Q4-CES-RES-RPS.pdf](https://www.nyscrda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2017-Q4-CES-RES-RPS.pdf)
- 14 Case 15-E-0302, supra, Order Adopting Measures for the Retention of Existing Renewable Baseline Resources, (issued March 16, 2018).
- 15 The Commission authorized the financial backstop to recover these costs from delivery customers. The most recent agreements have used uncommitted funds.
- 16 <https://www.nyscrda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2017-Q4-CES-RES-RPS.pdf>
- 17 <https://www.nyscrda.ny.gov/-/media/Files/Programs/Clean-Energy-Standard/2017-Q4-CES-RES-RPS.pdf>
- 18 <https://www.nyscrda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Clean-Energy-Fund-Reports>
- 19 <https://www.nyscrda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/NY-Sun-Performance-Reports>
- 20 Case 15-E-0302, Staff White Paper on Clean Energy Standard (filed January 25, 2016).
- 21 SCC is an estimate of the societal benefits of reducing greenhouse gas emissions. VDER uses the value published annually by the US EPA which represents, in dollars, of the long-term damage done by a ton of carbon dioxide emissions in a given year.
- 22 Case 15-E-0082, Policies, Requirements, and Conditions for Implementing a Community Net Metering Program (issued and effective March 9, 2017).

- 23 Case 15-E-0751 and Case 15-E-0082; supra, Order on Net Energy Metering Transition, Phase One of Value of Distributed Energy Resources, and Related Matters, (issued and effective March 9, 2017).
- 24 Case 18-E-0071, In the Matter of Offshore Wind Energy, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement (issued and effective July 12, 2018).
- 25 [https://portal.nyscrda.ny.gov/CORE\\_Solicitation\\_Detail\\_Page?SolicitationId=a0rt000000UTbqSAAT](https://portal.nyscrda.ny.gov/CORE_Solicitation_Detail_Page?SolicitationId=a0rt000000UTbqSAAT)
- 26 <https://www.lipower.org/wp-content/uploads/2018/06/2018-06-29-PSEG-LI-Utility-2.0-2018-Annual-Update.pdf>
- 27 [https://www.lipower.org/wp-content/uploads/2018/11/LIPA\\_2019Budget\\_WEB.pdf](https://www.lipower.org/wp-content/uploads/2018/11/LIPA_2019Budget_WEB.pdf)
- 28 <https://www.psegliny.com/aboutpseglongisland/ratesandtariffs/tariffs/feed-in%20tariff%20v>
- 29 Rocky Mountain Institute Business Renewables Center: State of the Market Report. 2018. Available <https://info.rmi.org/brcsotm2017>
- 30 <https://www.nyscrda.ny.gov/About/Newsroom/2018-Announcements/2018-12-13-Governor-Cuomo-Announces-Dramatic-Increase-in-Energy-Efficiency-and-Energy-Storage>
- 31 <http://www3.dps.ny.gov/W/PSCWeb.nsf/0/502EF210A0D15B2885257687006F39D8>
- 32 [https://nygats.ny.gov/ng/Report/getdto\\_view\\_Report\\_PublicProjectsAll](https://nygats.ny.gov/ng/Report/getdto_view_Report_PublicProjectsAll)
- 33 Hydroelectric generation facilities owned by NYPA including the Niagara and the Saint Lawrence Generating Stations
- 34 Due to the nature of energy market transactions across borders, the 2017 baseline renewable energy may include or exclude imported renewable generation that was part of the 2014 baseline calculation. Differences between years may also be attributable to the variations in climatic conditions in a given year as generation from renewable resources is weather-dependent
- 35 Due to the nature of energy market transactions across borders, the 2017 baseline renewable energy may include or exclude imported renewable generation that was part of the 2014 baseline calculation. Differences between years may also be attributable to the variations in climatic conditions in a given year as generation from renewable resources is weather-dependent.
- 36 The Tier 1 contribution of 124,373 MWh does not change the overall renewable %. Tier 1 energy from Fuel Cells are included in Natural Gas.
- 37 [https://nygats.ny.gov/ng/Report/getdto\\_view\\_Report\\_PublicEDPLLabel](https://nygats.ny.gov/ng/Report/getdto_view_Report_PublicEDPLLabel)
- 38 Case 15-E-0302, Proceeding on Motion of the Commission to Implement a Large-Scale Renewable Program and a Clean Energy Standard (issued and effective July 16, 2018).
- 39 NYSERDA completed the ZEC reconciliation process and issued statements to LSEs on October 5, 2018 with payment due to NYSERDA by November 4, 2018. LSEs whose load share ratio decreased from their historical amount received a refund from NYSERDA, those LSEs whose load share increased received an invoice to purchase the additional ZECs necessary to meet their obligation.
- 40 Note that the ZEC Compliance Year is from April 1 to March 31 so there may be a difference in the number of obligated LSEs and the obligated load when compared to RES Compliance Year reporting.
- 41 <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/286D2C179E9A5A8385257FBF003F1F7E?OpenDocument>



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