# New York's Renewable Portfolio Standard: Where To From Here?

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## Executive Summary

***The state receives six dollars in economic development for every dollar spent on RPS.***

NEW YORK HAS AN AMBITIOUS state renewable portfolio standard (RPS) aimed at seizing the many benefits of renewable electricity generation. Like most states with RPS targets, though, New York is not on track to meet its renewables target despite continued strong state leadership in the area. As the New York Public Service Commission embarks on a comprehensive review of the RPS program, this report provides an analysis of the significant progress made in New York to date, and an assessment of some of the opportunities and challenges that lie ahead. Currently scheduled to sunset in 2015, New York's RPS provides financial incentives to renewable generators in New York to make renewable electricity competitive with more traditional forms of electricity generation. Under the RPS, New York has added nearly 2,000 megawatts (MW) of new renewable generation capacity to date, enough to meet roughly 3% of New York electricity demand. RPS investments have yielded significant economic returns and societal benefits for New York.

It has been estimated that the state receives roughly six dollars in economic development for every dollar spent on the RPS. Increased renewable generation also reduces the state's reliance on fossil fuels, most of which originate out-of-state. Reduced reliance on fossil fuels also means less pollution that causes acid rain, smog and global warming.

Renewable energy is a high value proposition that benefits all New Yorkers. State leaders have an opportunity to better seize the opportunities renewable energy presents by overcoming the remaining barriers to investment, driving market transformation and accelerating renewable energy deployment. The goal is a greener, safer, more cost-effective energy future for New Yorkers.

## Recommendations for a Renewable Energy Future

As set out more fully in this report, the New York Public Service Commission and other state leaders should foster long-term regulatory certainty for the renewables market in New York by taking a holistic approach that incorporates new business and funding models designed to overcome current challenges. Recommendations to achieve these goals are set out below.

- Provide long-term regulatory certainty for renewable energy developers:
  - The program should establish long-term incentives that will create program stability and certainty for investors.
  - Future annual dollar budgets for the RPS program should be set at least at 2015 levels and increased as necessary to meet future demand.
  - Timetables for the RPS should be extended at least until 2025 to remain in-line with Governor Cuomo's proposed ten-year NY-Sun Initiative.
  - Program administrators should adopt and adhere to regular solicitation schedules.
- Take a holistic approach:
  - NYSERDA should utilize other programs in concert with the RPS, such as the forthcoming Green Bank, due to the complex nature of the energy markets.
  - The state should review tax incentive programs to offset the potential expiration of federal production tax credits for renewable energy.
  - Upgrade transmission and distribution lines through the state Energy Highway initiative and other utility investments, thereby creating a more efficient grid and facilitating greater deployment of renewables in the state.
  - Engage in multi-agency planning and regional efforts to develop off-shore wind, which has the potential to provide a significant amount of high capacity, emissions-free generation in close proximity to New York's highest demand centers downstate.
  - Develop programs that expand renewable energy opportunities in diverse communities by enacting new laws and regulations that allow investments such as "shared renewables" that enable low-income, renters, and multi-family housing to take advantage of renewable resources and their associated benefits.
- Develop new funding and business models:
  - Work at the state and federal level to expand availability of master limited partnerships (MLPs) and real estate investment trusts (REITs) to the renewable energy sector, tools that are already available to the fossil fuel industry, along with other efforts to bring capital markets financing to clean energy.
  - Enhance existing innovative financing mechanisms, such as on-bill recovery and property assessed clean energy (PACE), for all market sectors.

## 1 Introduction

New York is a leader in promoting renewable electricity generation. The Renewable Portfolio Standard (RPS) is New York's most effective tool in the effort to drive the development of renewable energy. Initiated in 2005, New York's RPS currently aims to meet 30% of the state's electricity consumption with renewable generation by 2015, from a baseline of roughly 19% renewables already supplied by large legacy hydropower projects in the state. Available forms of generation include wind, solar photovoltaic (PV) and solar thermal, fuel cells, anaerobic digesters, small hydropower, and biomass.

In late 2013, the Public Service Commission (PSC) will commence a comprehensive examination of the state's clean energy portfolio in a multi-program review process that includes the RPS. The outcomes of this PSC review will shape the state's post-2015 clean energy policies. In addition, a series of recently filed petitions at the PSC will have a direct bearing on the RPS program's near-term for 2014 and 2015.[1] This report will evaluate the current progress toward the RPS goals and provide recommendations to policy makers as they shape New York's next generation of renewable energy programs.

1 In September 2013, NYSERDA filed a number of petitions related to the RPS, including one to reallocate funds to support the NY-Sun Initiative for 2014 and 2015. Case 03-E-0188, Proceeding on Motion of the Commission regarding a Retail Renewable Portfolio Standard, Petition NY-Sun 2014-2015 Funding Considerations and Other Program Modifications filed (Sept. 5, 2013); and to initially capitalize the NY Green Bank, Case 13-M-0142, Petition of the New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank filed (Sept. 9, 2013). It is anticipated that in late 2014 early 2015 NYSERDA and the PSC will begin deliberations regarding the longer-term post-2015 programs.

## 2 Background on New York's Renewable Portfolio Standard

### Brief History

After the 2002 State Energy Plan warned of the state's overreliance on fossil fuels, New York sought to become more energy efficient and less dependent on electricity generated from coal, oil, and natural gas. Governor George Pataki's Greenhouse Gas Task Force recommendations, issued in 2003, included creating an RPS and a regional cap-and-trade program later named the Regional Greenhouse Gas Initiative (RGGI), which sought to reduce GHG emissions from power plants.[2] In 2004, after extensive stakeholder engagement and a review of benefits and costs, the PSC issued an order adopting the RPS.[3]

The initial RPS goal was to meet 25% of the state's 2013 electricity demand with renewable forms of energy.[4] After its 2009 mid-course review of the RPS program and adoption of an Energy Efficiency Portfolio Standard to reduce forecasted electricity demand, the PSC issued an Order adjusting the target to 30% and extending the program to 2015.[5] The PSC review currently underway will determine the program's future, including time horizons, annual funding support, and program design.

### The Way New York's RPS Works

Most RPS programs in the United States require utilities and certain other electricity suppliers to meet a specified percentage of their customer demand with renewable generation or pay a noncompliance penalty.[6] In contrast, New York uses a central

2 The Center for Clean Air Policy, Recommendations to Governor Pataki for Reducing New York State Greenhouse Gas Emissions (2003); New York State Energy Planning Board, New York State Energy Plan (2002).

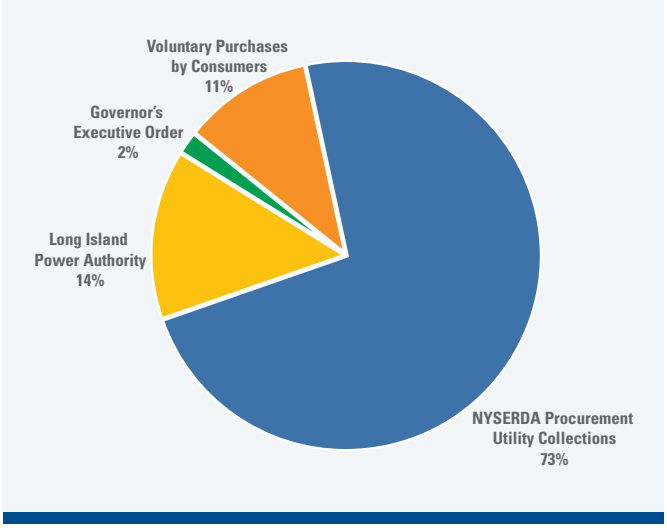
3 Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Order Regarding Retail Renewable Portfolio Standard, issued and effective (Sept. 24, 2004).

4 Id.

5 Although the PSC increased its RPS target in 2009 from 25% by 2013 to 30% by 2015, this increase happened in concert with the adoption of an Energy Efficiency Portfolio Standard (EEPS) to reduce forecasted electricity demand in June of 2008. While the shift in RPS targets sounds like an increase, the increased percentage is the result of a lower forecast for energy consumption in 2015 due to increased investment in energy efficiency that reduced projected statewide electricity demand. Thus, the new goal is in effect the same absolute renewable generation target (10.4 million MWh) as the original 25% goal but a larger "piece" of a smaller "pie". NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 7 (2011).

6 Utilities and electricity suppliers commonly satisfy this requirement through the purchase of Renewable Energy Credits (REC), which represent the environmental attributes of 1 MWh of renewable electricity generation and are typically separate and apart in the marketplace from the actual electricity generated. Stephen Beam,

**FIGURE 1: To Reach RPS Target, NY Relies on NYSERDA Central Procurement (73%), State Agency Actions (16%) and Voluntary Purchases (11%).**




procurement model in which the six major investor-owned utilities (IOUs) are required to collect an RPS charge from their electricity customers.[7] Once collected, the RPS charges are transferred to a fund administered by the New York State Energy Research and Development Authority (NYSERDA).

NYSERDA administers the RPS program by providing financial incentives to renewable energy projects. Depending on the location, type, and size of the project, NYSERDA incentives take one of two forms. Larger utility-scale projects are generally handled through requests for proposals, or solicitations issued by NYSERDA. Winning bidders are awarded a performance-based payment per MWh of electricity generated by the project. Smaller projects generally are eligible for an upfront rebate provided on a first-come, first-served basis.

In addition to the RPS program for the six IOUs subject to PSC jurisdiction, the original order by the PSC assumed that for the purpose of setting statewide RPS goals, additional renewable energy would be procured by state agencies, the New York Power Authority (NYPA),[8] the Long Island Power Authority (LIPA), and through voluntary purchases of renewable electricity by customers.[9] Although the focus of this report is on the PSC jurisdictional program, Figure 1 shows the whole RPS structure in New York.[10]

## RPS Goals

The RPS program has four principal goals:

1. Diversify the state's electricity portfolio through renewable electricity generation;
2. Bolster the state's energy security through in-state renewable energy resources;
3. Reduce pollution from the electric sector; and
4. Stimulate economic development by investing energy dollars in New York and spending less on out-of-state fossil-fuel supplies.

## Two-Tiered RPS

The RPS is divided into two tiers: the main tier and the customer-sited tier. Both tiers are described below.

### THE MAIN TIER

The main tier program supports medium to large-scale projects that supply electricity to the bulk electric system, although in some circumstances so-called "behind-the-meter" installations directly serving customer electric demands are also eligible.

Renewable Choice Energy, Buying Green Power in a Deregulated Market (May 23, 2013) available at http://www.renewablechoice.com/blog-green-power-deregulated-market-12-05-23.html (last visited Oct. 5, 2013).

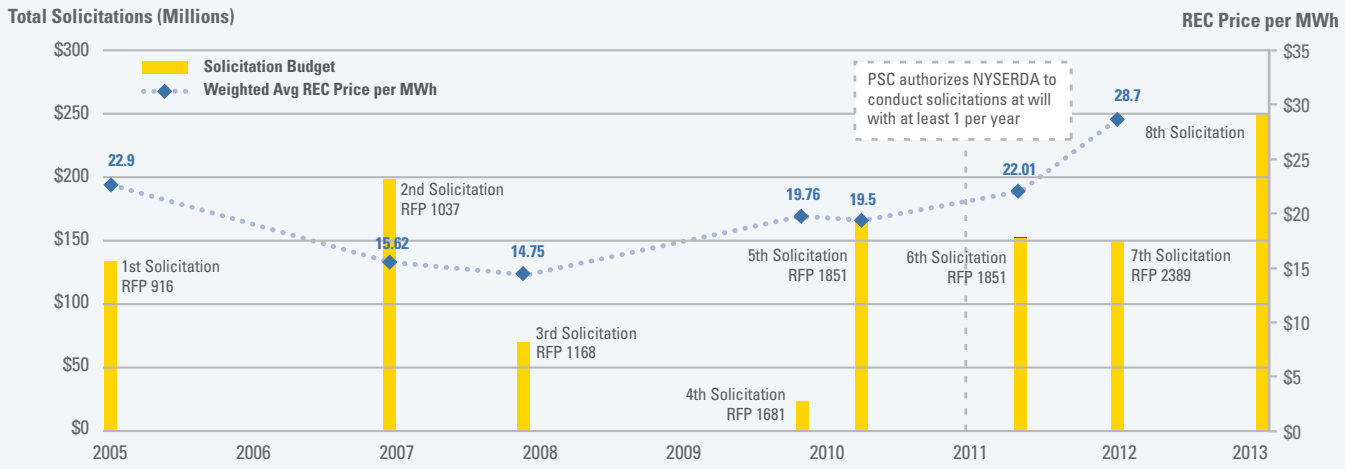
7 The volumetric charge for residential customers is $0.0019 per kWh of electricity consumption. The average utility residential costumer consumes roughly 940 kWh per month, which equates to $1.84 per month to support the RPS.

8 NYPA renewable energy funding largely consists of research and development as opposed to direct support for resource acquisition, though it has directly funded a small number of renewables projects. To date, NYPA has installed 122 PV projects with a combined capacity of 2,500kW in New York. NYPA has also dedicated $30 million to its "Solar MAP" (Market Acceleration Program) which is designed to research innovative solar technology, fund demonstration projects, and create soft cost strategies that will help reduce costs in the marketplace. More information is available at: http://www.nypa.gov/solar/.

9 While the PSC's jurisdiction does not extend to the Long Island Power Authority or the New York Power Authority, these authorities are expected to contribute to achievement of the RPS percentage goal. In addition, New York relies on voluntary purchases of renewable energy to finance a small portion of the total goal. These non-PSC-controlled contributions are discussed later in the report.

10 The statewide 30% target requires about 45.7 million MWh of renewable energy to be procured in 2015. Prior to the RPS program, NY was consuming about 31.5 million MWh per year from renewables (setting the baseline at about 19% of all electricity delivered from large-scale legacy hydro). In order to achieve the 30% target, the PSC projected that NYSERDA would need procure an additional 10.4 million MWh, LIPA would need to procure about 1.9 million MWh, with the balance of 1.9 million MWh to be provided by the voluntary market and purchases by state agencies under Executive Order 111. NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 33 (2012).

**FIGURE 2: Timeline of NYSERDA Solicitations and REC Price Per Megawatt Hour**




The 8th Solicitation was originally released on December 20, 2012 and then was reissued on January 4, 2013. The resulting awards are still pending.

The main tier accounts for the majority of the overall RPS investments, and consists of periodic requests for proposal (RFPs) from NYSERDA.[11] Renewable developers competitively bid on these RFPs, and the best bids receive multi-year contracts that consist of a "dollars per MWh generated" production incentive. Eligible renewable technologies in the main tier include: wind, biomass, landfill methane used to generate electricity, and hydroelectric. Wind has dominated the market, accounting for 79% of the renewable electricity contracted under the main tier. Figure 2 illustrates past RFP solicitations and the average price of the "dollars per MWh" incentive.

When combined with other incentives available, such as federal production and investment tax credits, NYSERDA's long-term incentives are designed to enable renewable generation to compete with fossil fuel generators.[12] In exchange for the production incentive, developers deliver renewable electricity along with the associated environmental and economic benefits to New York consumers, thereby completing the return on ratepayers' original investment through the RPS surcharge.[13] Through this transaction, the renewable generator transfers to NYSERDA all rights and claims to the environmental attributes from these renewable energy facilities known as renewable energy credits (RECs).[14]

## CUSTOMER-SITED TIER

The customer-sited tier is focused on supporting smaller-scale distributed renewable projects at New York homes, schools, businesses, and government buildings. Eligible technologies under the customer-sited tier include solar photovoltaics (PV), solar thermal, fuel cells, small wind, and anaerobic digesters.[15] In contrast to the main tier, power from customer-sited tier projects is generally consumed on site and intended to help offset the electricity demands of customers. Alternatively,

11 Through December 31, 2012 the NYSERDA has funded $871.9 million in main tier acquisitions and $280.8 million in customer-sited funding. NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 33 (2012).

12 As highlighted in the NYSERDA, New York Solar Study: An Analysis of the Benefits and Costs of Increasing Generation from Photovoltaic Devices in New York (2012). The federal Production Tax Credit (PTC), which provides a per kilowatt-hour tax credit to qualified electric generators, and the Investment Tax Credit (ITC) are key factors in making renewables competitive in the marketplace. If the PTC is allowed to expire year-end 2013 and the ITC at year-end 2016, the cost of New York's RPS will increase significantly because the state subsidy needed to make the renewable energy competitive will be much larger.

13 NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 4 (2012).

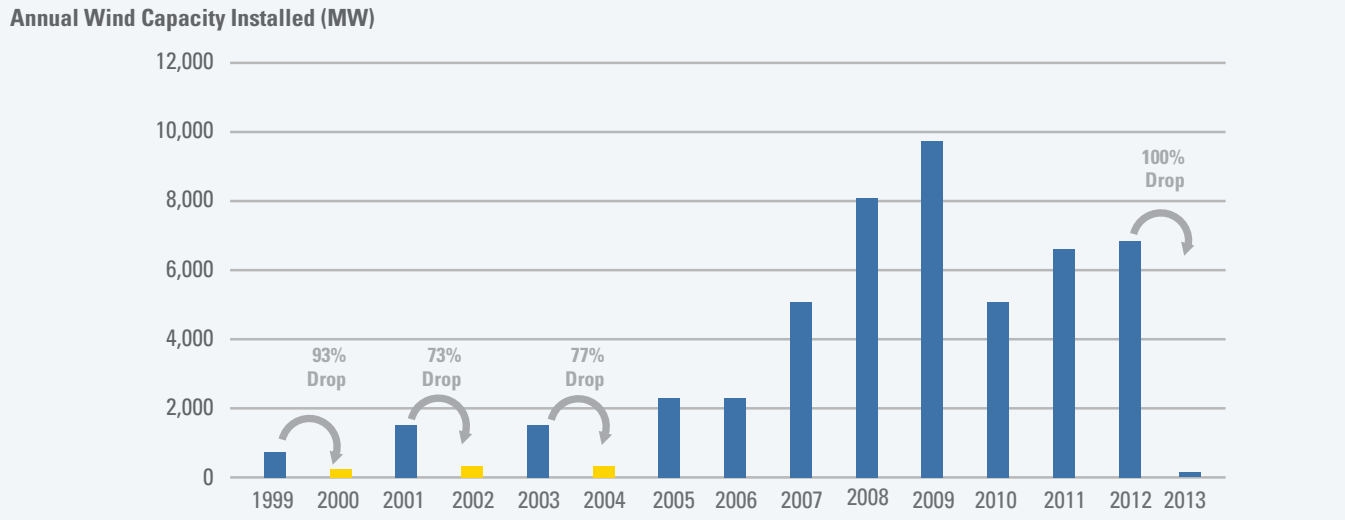
14 Renewable Energy Credits (RECs), represent the environmental attributes associated with the reduction of harmful air pollution such as sulfur, mercury, particulates and carbon dioxide emitted by 1 MWh of conventional power plants generation. "As of December 31, 2012, Main Tier contracted projects are expected to produce 4.49 million RPS Attributes." NYSERDA, Renewable Portfolio Standard Main Tier 2013 Program Review, Final Report at S-3 (2013).

15 For more on NYSERDA's CST program, see NYSERDA, Renewable Portfolio Standard Customer-Sited Tier, available at http://www.nyserda.ny.gov/BusinessAreas/Energy-Data-and-Prices-Planning-and-Policy/Program-Planning/Renewable-Portfolio-Standard/Customer-Sited-Tier.aspx (last visited Sept. 25, 2013).

## The Role of Federal Tax Credits

The Production Tax Credit (PTC) provides $23 tax credit for each MWh of clean energy generated and the Investment Tax Credit (ITC) provides a tax credit of approximately 30 percent of qualifying project costs. Congress has failed to extend the PTC several times, only to renew the credit the following session. This on-again, off-again history has contributed to a boom-bust cycle in the wind industry. New wind installations have dropped between 73 and 93 percent in years following PTC expiration. The PTC will sunset again for all generation types at the end of 2013. Based on past experience, the upcoming discontinuation of the PTC will cause a precipitous drop in new wind installations. The Figure below from AWEA illustrates this impact. The ITC, which primarily is used by solar projects, is set to step down to 10% at year-end 2016.

**Historic Impact of PTC Expiration on Annual Wind Installation**




***The RPS seeks to diversify and secure the state's electricity portfolio, reduce pollution and stimulate economic growth.***

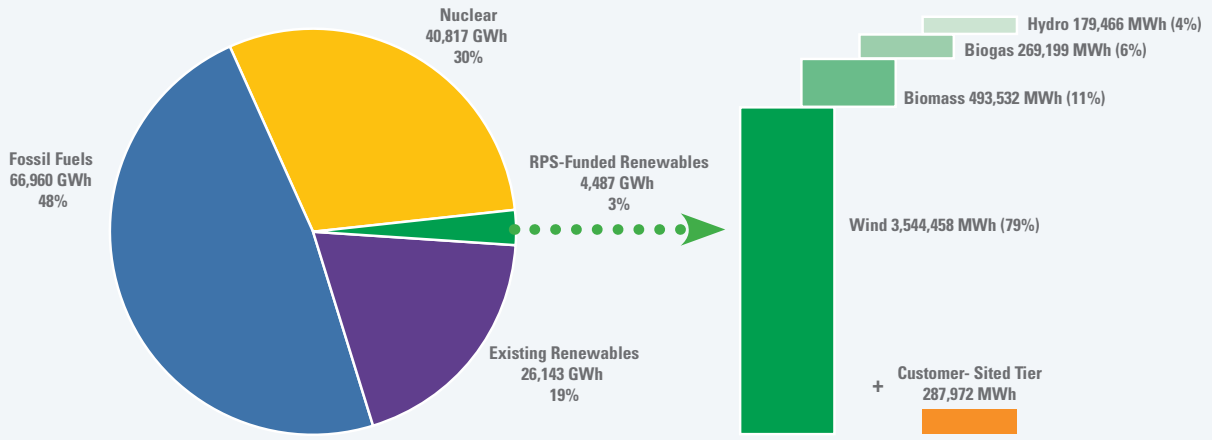
some customers sell excess electricity back to utilities through a policy known as net metering, discussed later in this report. In the early years of the program, the customer-sited tier was limited to upfront rebate incentives to projects on a first-come, first-served basis for residential and non-residential electricity customers.[16] More recently, the PSC modified the program to 1) increase the number of renewable installations downstate; and 2) implement Governor Cuomo's NY-Sun Initiative. Through the Orders to modify the program, the PSC also added a competitive solicitation process, similar to the main tier, for larger commercial customer-sited solarprojects.[17,18] Figure 3 shows the overall electricity generation within the state and the percentage coming from renewables, as well as a breakdown between the two tiers.

16 The PSC has recently approved a NYSERDA petition that increases solar PV system sizes eligible for the rebate program, residential systems are now capped at 25 kW and non-residential systems are capped at 200 kW. NYSERDA, Case 03-E-0188, Proceeding on Motion of the Commission regarding a Retail Renewable Portfolio Standard , Order Authorizing Modifications of the Solar Photovoltaic Program in the Customer-Sited Tier, issued and effective (July 22, 2013).

17 Both the PSC's 2010 Geographic Balancing Order and subsequent statewide solicitations from NYSERDA permit both solar PV and biogas projects to submit competitive bids. To date, however, only solar projects have participated and received awards. See NYSERDA PON 2484, Renewable Portfolio Standard (RPS) Customer-Sited Tier Regional Program, available at http://www.nyserda.ny.gov/Funding-Opportunities/Current-Funding-Opportunities/PON-2484-Renewable-Portfolio-Standard-Customer-Sited-Tier-Regional-Program.aspx (last visited Oct. 5, 2013).

18 In July of 2013 the PSC increased the minimum system size eligible to compete in the competitive PV program from 50 kW to 200 kW. Although there is currently no absolute maximum cap on system size for that program, NYSERDA requires that a project does not exceed 110% of a customer's aggregated annual demand. Maximum incentive per project is capped at $3 million, and maximum award per developer per round is $6 million. And with a system size cap of 2 MW for non-residential net metering systems, to date most projects have been no greater than 2 MW in order to ensure net meter eligibility and the increased likelihood of winning an incentive award as a result of improved economics through net metering. Case 03-E-0188, Proceeding on Motion of the Commission regarding a Retail Renewable Portfolio Standard , Order Authorizing Modifications of the Solar Photovoltaic Program in the Customer-Sited Tier, issued and effective (July 22, 2013).

**FIGURE 3: What Has Been Built Using RPS Funds?**




**New York's 2012 Electric Generation by Fuel Type**

**Expected 2015 Generation from Contracted Main Tier Projects**
4,486,656 MWh

### A DIVERSE PORTFOLIO

All megawatts are not created equal. On a levelized cost of energy basis,[19] large-scale upstate wind farms are generally less costly to build (per unit of capacity), and help support local communities through tax and land owner payments. Customer-sited projects, which can be more costly to install on a per MW basis, deliver unique grid and public policy benefits.[20] For example, smaller distributed renewables can be sited strategically to relieve congestion on transmission and distribution lines delivering electricity from within load pockets that are difficult to serve. This is particularly true in Southeastern New York where electricity prices are also highest. By siting generation close to customer demand, less energy is lost through "line losses" compared to traveling long distances on transmission and distribution wires.[21]

These characteristics of customer-sited or distributed generation enhance the benefits and can offset the higher per-unit cost of such projects. Meanwhile larger-scale upstate wind provides a lower cost, higher volume resource. By balancing system efficiencies and economic benefits, a well-designed RPS can support a diverse mix of renewable resources across the state.

New York's two-tiered approach to renewables is therefore designed to accomplish varied, interdependent goals and harness the different strengths of both the main tier, utility-scale generation, and the customer-sited, smaller scale generation. Of the 10.4 million MWh target to be achieved by 2015, NYSERDA currently plans to meet 9.5 million MWh through the main tier with the remaining 0.9 million MWh to be provided by the customer-sited tier.

## The Benefits of an RPS

As highlighted in a recent Lawrence Berkeley National Lab report, state RPS programs are the single-most important policy driver of renewable energy deployment in the nation.[22] Decreasing the

19 National Renewable Energy Laboratory, Levelized Cost of Energy Calculator, available at http://www.nrel.gov/analysis/tech_lcoe.html (last visited Oct. 5, 2013). See also, LAZARD, Lazard's Levealized Cost of Energy Analysis – Version 7.0 (Aug. 2013) available at http://gallery.mailchimp.com/ce17780900c3d223633ecfa59/files/Lazard_Levelized_Cost_of_Energy_v7.0.1.pdf (last visited Oct. 5, 2013).

20 A recent paper by the Rocky Mountain Institute includes extensive analysis and discussion of the unique benefit metrics delivered by distributed solar installations. See generaly, Rocky Mountain Institute, A Review of Solar PV Benefit and Cost Studies available at http://www.rmi.org/Content/Files/eLab-DER_cost_value_Deck_130722.pdf (last visited Oct. 5, 2013).

21 Known as "line losses", the PSC assumes roughly "[t]wo to three percent of New York's electricity is consumed by transmission system losses, and an additional four to eight percent is consumed by losses in the distribution system." Case 08-E-0751, Proceeding on Motion of the Commission to Identify Sources of Electric System Losses and the Means of Reducing Them, Comments of the New York Independent Systems Operator, Inc. on Technologies to Reduce Real Reactive Power Losses on the New York Power Systems issued and effective (March 1, 2010). During peak demand the percentage can be as high as 20%; Regulatory Assistance Project, Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements (2011).

22 See Lawrence Berkeley National Lab, LBNL RPS Compliance Data Spreadsheet available at http://www.dsireusa.org/rpsdata/index.cfm. (last visited Oct. 5, 2013).

state's reliance on electricity generated from fossil fuels reduces carbon pollution as well as smog and acid-rain-causing pollution, diversifies the state's electricity generation portfolio, and increases state energy security by reducing dependence on out-of-state fossil fuels.[23] NYSERDA found that in 2011 alone over $38 billion in energy expenditures left the state.[24] Investing in homegrown, renewable resources will reduce these out-of-state energy expenditures and in turn drive in-state economic growth.

The RPS also helps drive a reduction in the overall cost of electricity through the "wholesale price suppression effect." This price suppression occurs because renewable resources have minimal operating costs since in most instances their "fuel" is free.[25]

Renewable generation helps to push the least efficient, dirtiest, and most costly generation facilities out of the electricity portfolio mix, resulting in lower wholesale electricity prices.[26] As a result, New Yorkers pay less for their electricity. An analysis conducted in 2009 estimated that the New York RPS program would reduce the 2010 New York wholesale electricity price by $2 per MWh (roughly 4% of the average wholesale price).[27] Additionally, the 2012 NYSERDA Solar Study concluded that installing 5,000 MW of solar photovoltaic (PV) by 2025 would result in savings of $3.3 billion from the wholesale price suppression effect.[28]

The RPS incentives for renewable projects are important considering that these technologies—while declining in cost every year—still carry an upfront construction cost premium as compared to conventional fossil fuel plants.[29] Plants powered by coal, oil, and natural gas plants, have lower "fixed" costs but relatively high "variable" costs in the form of fuel, pollution allowances, and operation and maintenance expenditures over the lifetime of those facilities. In contrast, renewables have very low

23 "The environmental benefits of having electricity generated by the RPS facilities from 2006 through 2011, as opposed to the state's "system-mix," amounts to approximately 3,086 tons of nitrogen oxides, 6,782 tons of sulfur dioxides, and 3.1 million tons of carbon dioxide in reduced emissions over this time period." NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 20 (2012).

24 NYSERDA Patterns and Trends available at http://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/EA-Reports-and-Studies/Patterns-and-Trends.aspx (last visited Oct. 5, 2013).

25 Wind and solar have zero fuel costs, while biomass projects—which constitute a small fraction of the overall RPS portfolio—do have significant fuel acquisition and processing costs.

26 In the NYISO wholesale electricity markets, resources bid in based on their variable costs. Bids are accepted until demand is met, moving up a cost curve from lowest to highest cost. The last bid accepted is known as the "marginal unit" and is typically the least efficient in the "bid stack". With renewable energy bidding in at near zero, the more renewable energy facilities bidding into the NYISO market pushes out the least efficient, dirtiest and most expensive units.

27 Kema, New York Main Tier Rps Impact and Process Evaluation (2009); and Summit Blue, New York Renewable Portfolio Standard Market Conditions Assessment (2009).

28 "The total net present value of the impact [wholesale price suppression effect] under Base Case assumptions is $3.3 billion, or approximately 0.9% of total electricity bills over the study period." NYSERDA, New York Solar Study: An Analysis Of The Benefits and Costs of Increasing Generation from Photovoltaic Devices In New York at 38 (2012).

29 The "levelized cost of energy" for various generation technologies is the common methodology utilized by the finance and development community. Lazard provides a useful analysis and explanation of this approach in its August 2013 Levelized Cost of Energy 7.0 http://gallery.mailchimp.com/ce17780900c3d223633ecfa59/files/Lazard_Levelized_Cost_of_Energy_v7.0.1.pdf.

operating costs over the life of a project because they do not require fossil fuels to operate and maintenance costs are minimal. As a result, the financing community has struggled with financing what is essentially an inverted value proposition compared to traditional projects.

The production incentives or rebates provided by NYSERDA help to make these investments viable and more readily able to secure financing by offsetting the necessary up-front capital investment with renewable projects. Along with federal and state tax credits, RPS incentives provide a "bankable" commitment that enable developers and customers to secure private sector financing.

The direct economic benefits to New York from the RPS program are approximately $29 per MWh of renewable electricity installed, in the form of salaries, host community payments, payments-in-lieu-of-taxes, rent, and fuel savings.[30] Of the first eighteen facilities funded through the main tier of the RPS (a total of fifty-four have been funded to date), $1.1 billion in direct dollars will be added to the New York economy over the lifetime of the contracts from the initial investment of $440 million. Extensive third-party analyses have repeatedly concluded that the RPS has been a net benefit to the state.[31] The remaining question is what New York can do to build on this success, come as close as possible to achieving 2015 targets and ensure the next generation of programs maximizes the cost-effective deployment of renewable generation into the future.

## PROGRESS, OPPORTUNITIES AND CHALLENGES

As a result of seven main tier solicitations and incentives awarded for smaller projects under the customer-sited tier, New York's RPS program will drive the development of nearly 2,000 MW of new renewable electricity generating capacity by the end of 2013, which represents roughly 5% of the states total installed generating capacity.[32] In terms of the amount of electricity generated, RPS resources contracted to date are expected to generate 4.9 million MWh per year by 2015—a number that should increase as a result of new incremental projects funded in the final two years of the existing program.[33] This 4.9 million MWh in 2015 is 46% of the RPS program target, and is equivalent to roughly 3% of the forecasted New York electricity demand for 2015.[34]

The 54 large-scale projects funded by the main tier to date will total 1,834 MW when all the facilities are fully operational.[35] Figure 4 illustrates RPS progress through these first seven solicitations, revealing NYSERDA is 47% of the way to its ultimate main tier target, and 33% of the way towards its ultimate customer-sited tier target. While these achievements are significant, if current build-out trends continue NYSERDA is likely to fall short of the overall target of meeting 10.4 million MWh of the state's electricity demand with renewables by 2015. However, based on NYSERDA analysis and forecasts, the magnitude of that shortfall depends heavily on the fate of the federal Production Tax Credit and how quickly the state contracts its remaining main tier budget through future solicitations.[36,37] Looking forward, New York could recover some of this lost ground before 2020 through the continuation of the RPS program enacting the necessary changes in procurement strategy, as discussed in the recommendations section of this report.

***The RPS can reduce the cost of electricity through the "wholesale price suppression effect."***

30 Case 03-E-0188,In Re Retail Renewable Portfolio Standard, NYSERDA, Reply Comments, Petition for Modification PSC filed (Mar. 6, 2013).

31 NYSERDA, New York State Renewable Portfolio Standard Customer-Sited Tier Program, Market Evaluation, Program Expectations and Funding Considerations 2013-2015 (2013); Nyserda, Renewable Portfolio Standard Main Tier 2013 Program Review, Final Report at S-3 (2013).

32 NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 4 (2012). In perspective 2,000 MW is approximately 5% of NY's total installed capacity, which was 38.9K MW in 2012; See NYISO, Baseline Forecast from the Nyiso 2012 Load And Capacity Data Report (2012).

33 NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 2 (2012).

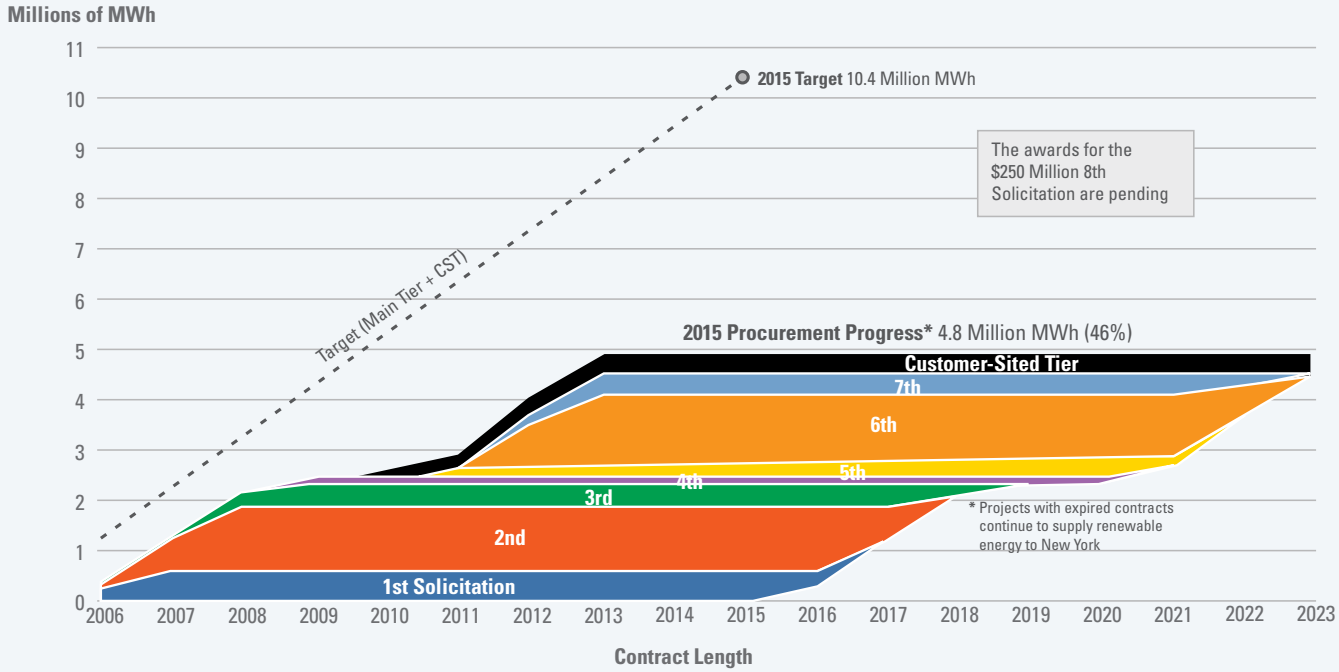
34 Id.

35 NYSERDA, Renewable Portfolio Standard Main Tier 2013 Program Review, Final Report at S-3 (2013). "On the basis of the baseline funding presented in Table 2-1b and the currently authorized CST program design, Table 2-1a outlines the expectations for capacity and energy production associated with projects installed and under contract by the end of 2015 (the end of the current CST program) as approximately 553 MW and 862,499 MWh, 108% and 98%, respectively, of the program targets." NYSERDA, New York State Renewable Portfolio Standard Customer-Sited Tier Program, Market Evaluation, Program Expectations and Funding Considerations 2013-2015 at 10 (2013).

36 Although the program appears to have the necessary funding, currently only 40% of the total approved budget has been spent on contracts. NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 4 (2012). "Approximately $876.6 million, or roughly 38% of the total approved RPS Main Tier funding has been expended or committed to achieving the 2015 Main Tier target." NYSERDA, Renewable Portfolio Standard Main Tier 2013 Program Review, Final Report at S-3 (2013).

37 NYSERDA ran two scenarios in which 79% or 86% of the 2015 Main Tier target is achieved. Id.

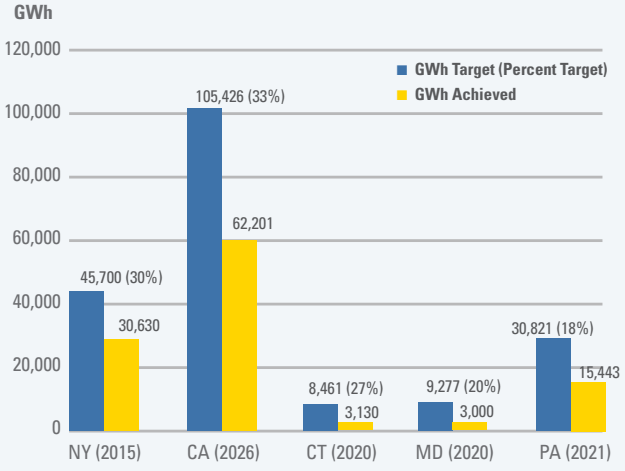
**FIGURE 4: Progress Towards 2015 Target**




## Why has New York struggled to meet its RPS targets?

Despite a steady political commitment to renewable energy, New York is not on track to meet its RPS target. As illustrated in Figure 5, a number of other states leading the charge on renewable energy are also behind in reaching their targets. A number of factors, some of which are outside the states' control, have contributed to these shortfalls. Chief among these are historically low natural gas prices and related declines in wholesale electricity prices—drivers that fundamentally increase the per MWh incentive needed to make utility-scale renewable projects economic.[38,39] In addition, renewable developers have been hampered by the recent economic downturn and tightened credit market, perpetual uncertainty around federal renewable tax incentives,[40] as well as challenges siting projects.

**FIGURE 5: State RPS GWh Targets vs Current Achievement**




Each state's Renewable Portfolio Standard has a unique set of requirements for determining resource eligibility.

38 Average 2012 NYISO wholesale electricity process were 52% lower than they were in 2008; See Press Release, New York Independent System Operator, Record Low Power Prices, Sustained System Reliability Highlight Positive 2012 Market Developments (Jan. 23, 2013) available at http://www.nyiso.com/public/webdocs/media_room/press_releases/2013/NYIS_Record_Low_Power_Prices_%20Sustained_System_Reliability_Highlight_Positive_2012_Market_Development_%2001_23_13_FINAL.pdf (last visited Oct. 18, 2013); See also, According to EIA, New York natural gas prices for electricity generation have fallen by 64% since 2008, and are projected to remain relatively low for the foreseeable future; U.S. Energy Information Administration, Natural Gas Prices, available at http://www.eia.gov/dnav/ng/ng_pri_sum_dcu_SNY_a.htm (last visited Oct. 18, 2013).

39 While annual average natural gas prices have trended low in recent years, an increasing overreliance on gas-fired generation combined with supply infrastructure constraints—particularly in the Northeast—have resulted in significant seasonal wholesale electricity and gas commodity price volatility. Increasing the supply of renewable energy provides a hedge against these price spikes. See John Chesto, Massachusetts Faces Natural Gas Shortage Despite National Surge, The Boston Business Jour. available at http://www.masslive.com/business-news/index.ssf/2013/02/massachusetts_faces_natural_gas_shortage.html (last visited Oct. 5, 2013).

40 Absent Congressional action by the end of the year, the PTC will expire Dec 31, 2013 and its possible renewal for either one or multiple years in 2014 remains uncertain.

The 2.7-megawatt solar generation project at Owens Corning's thermal and acoustical insulation plant in Feura Bush N.Y. is designed to supply approximately 6 percent of the plant's annual electricity needs. Financed, owned and maintained by Constellation, electricity generated by the system is purchased by Owens Corning under a 20-year power purchase agreement. The project was supported in part through Gov. Andrew Cuomo's New York Sun initiative to develop and construct large-scale solar projects.

With its recent flurry of PSC activity and appointment of some of the nation's thought leaders in the energy space, New York stands poised to rethink and reimagine its RPS program to overcome these complex issues and accelerate deployment of renewables to help meet future targets.[41] This report concludes with recommendations to assist in that effort.

## 3 Current RPS Issues

### Governor Cuomo's NY-Sun Initiative

In an Order issued April 24, 2012, the PSC authorized NYSERDA to grow the customer-sited program for solar photovoltaic installations and expand the competitive solicitation program statewide. The customer-sited program was initially created as the Geographic Balancing program to foster project development in the downstate region.[42,43] The PSC authorized NYSERDA to utilize $90 million of unencumbered main tier funds to fund this expansion through 2013, and to determine future funding as part of the 2013 review of the RPS program.[44] In the 2013 State of the State address, Governor Cuomo announced his commitment to extend his NY-Sun

The ITC is scheduled to expire at the end of 2016.

41 Governor Cuomo has appointed John Rhodes as President/CEO of NYSERDA, Audrey Zibelman as Chair of the PSC, and Richard Kauffman as Chairman for Energy Policy & Finance.

42 Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Order Authorizing the Expansion of the Solar Photovoltaic and Geographic Balance Programs from 2012 through 2015 and the Reallocation of Main-Tier Unencumbered Funds, issued and effective (April 24, 2012).

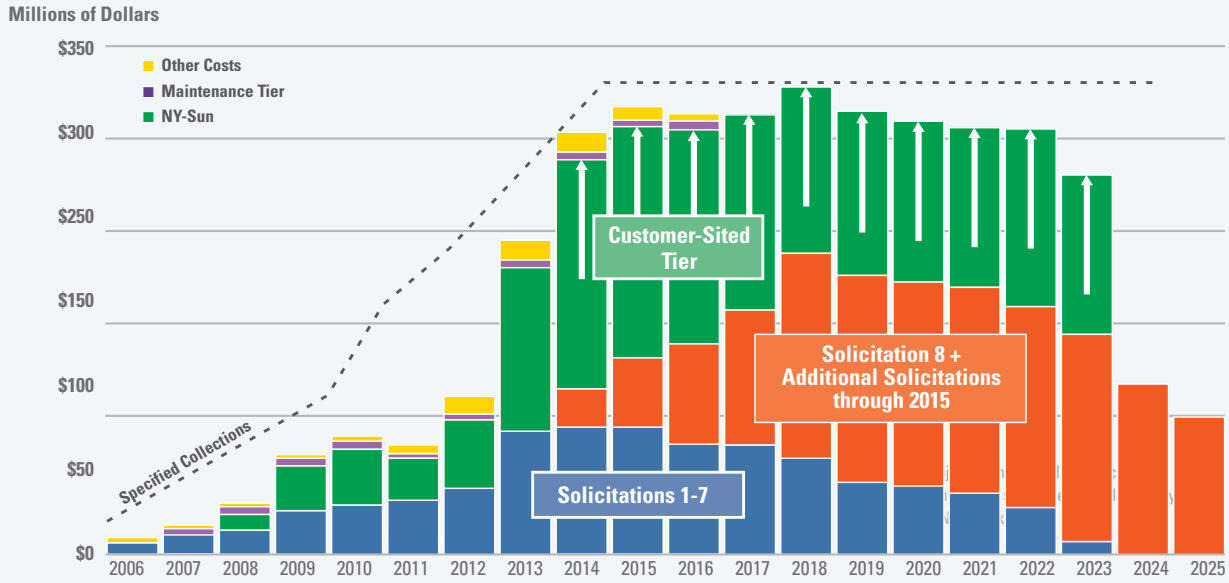
43 Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard Order Authorizing Customer-Sited Tier Program Through 2015 and Resolving Geographic Balance and Other Issues Pertaining to the RPS Program, issued and effective (April 2, 2010).

44 Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Order Authorizing the Expansion of the Solar Photovoltaic and Geographic Balance Programs from 2012 through 2015 and the Reallocation of Main-Tier Unencumbered Funds, issued and effective (April 24, 2012). In addition to incentives for actual PV installations, the NY-Sun Initiative includes expanded tax breaks for PV, R&D support, and a $30 million "Balance of System" cost project with NYPA to investigate the reduction of non-hardware installation costs. Press Release, Public Service Commission, PSC Approves NYSERDA Funding Request, (Sept. 13, 2012). available at http://www3.dps.ny.gov/pscweb/WebFileRoom.nsf/Web/D799071E3FA7033385257A78005ED34F/$File/pr12070.pdf?OpenElement (last visited Oct. 5, 2013); New York Sun Initiative, NY-Sun available at http://ny-sun.ny.gov/ (last visited Oct. 5, 2013).

**FIGURE 6: NY-Sun Initiative to Boost Customer-Sited Tier as a Share of Total Expenditures**

The 2012 target of the NY-Sun Initiative was to install twice the amount of customer-sited PV than was installed in 2011, and to quadruple that 2011 number in 2013. Since being launched in 2012 a total of 287 MW has either been installed or is currently under development. This represents more MW installed than in the entire previous decade. The rapid expansion in solar deployment has decreased the total cost of installation making the incentives offered go further. Today the portfolio-weighted average incentive is $0.84 per watt down from $1.03 per watt just in the past two years.

**Impact of NY-Sun Initiative on Macro RPS Budget**




Initiative through 2023, with statewide funding of $150 million annually through 2023.[45]

Slightly different versions of legislation to establish a ten-year NY-Sun program in state law passed both the State Senate and Assembly during the 2013 legislative session, but without reconciliation of the two pieces of legislation the extended NY-Sun program was not codified into statute.[46] Along with a broader RPS expansion, the proposed expansion of the NY-Sun program must now be achieved administratively through the PSC. Figure 6 shows estimated RPS spending with the funding increase in the NYSERDA solar PV program from $54 million to $108 million, the continued collection schedule through 2023 if no extension to the program were made, as well as the head-room if the 2015 collections levels were extended at the same level through 2023.[47]

## NYSERDA Petition and Out-of-State Project Eligibility

In May 2013, the PSC granted NYSERDA's petition to limit main tier contract awards to entities proposing to locate facilities within the State of New York.[48] Prior to this decision, NYSERDA weighed bids in each main tier

45 It is assumed that the $150m annual budget would include both LIPA collections and PSC jurisdictional collections administered by NYSERDA for the rest of state. Governor Andrew Cuomo, 2013 State of the State Address: NY Rising at 45 (Jan. 9 2013) available at http://www.governor.ny.gov/sites/default/themes/governor/sos2013/2013SOSBook.pdf (last visited Oct. 5, 2013).

46 NYS.2522, passed April 23, 2013 available at http://open.nysenate.gov/legislation/bill/S2522-2013; A.5060d, passed June 20, 2013 available at http://assembly.state.ny.us/leg/?default_fld=&bn=A05060&term=&Summary=Y&Actions=Y&Votes=Y&Memo=Y&Text=Y.

47 Currently NY-Sun consists of $108 million from the RPS and $38 million from LIPA collections and administration of their parallel solar programs. *"8th Solicitation + Any Additional solicitations through 2015" shows the costs that NYSERDA have budgeted for "future solicitations" in their 2012 Performance Report. The 8th Solicitation is budgeted for $250 million, leaving an estimated $1.2 billion for additional solicitations through 2015. "Other" costs include administration costs, evaluation costs, CST Quality Assurance and Quality Control costs and NYS fees.

48 Prior to this change, main tier generators could be located in NY or show that the electricity is delivered into NY and scheduled through the NYISO hourly market. CST generators must be located in NY.

solicitation using a 70/30 split, 70% of the contract bid was based on price, and 30% was based on projected economic benefits to the State of New York.[49] In addition, out-of-state projects were required to show delivery of energy into New York's wholesale market. In practice, the energy delivery requirement and the 70/30 split functioned as a considerable barrier to out-of-state bidders, though did not explicitly prohibit such projects outright. Indeed, only 3.8% of main tier projects (by capacity) had been awarded to out-of-state participants through the first seven solicitations.[50] The granting of the NYSERDA petition resulted in Hydro Quebec U.S. filing a petition for re-hearing at PSC. At issue is whether the Commission erred in excluding out-of-state generators under the Commerce Clause of the U.S. Constitution and whether the PSC acted arbitrarily and capriciously in making its decision.[51] At publication, comments by several parties on the matter have been submitted, but there has been no final ruling issued by the Commission.

## NY Green Bank

In his 2013 State of the State Address, Governor Andrew Cuomo announced the creation of a $1 billion Green Bank that would seek to leverage public funds and stimulate the entry of additional private investment into New York's clean energy economy. Governor Cuomo indicated that the Green Bank will aim to remove market barriers to energy efficiency and renewable energy deployment, including private credit market limitations, information gaps, and a changing federal policy environment.[52] While the Governor's team is currently still in the process of developing the bank's governance, staffing, administration and program design, early indications point toward the Green Bank focusing on partnering with private sector intermediaries and using targeted loans and credit enhancements to attract increasing amounts of private capital into the clean energy sector. On September 9, 2013, NYSERDA filed a petition with the PSC requesting to initially capitalize the NY Green Bank at $210.3 million by repurposing $50 million in unallocated RPS funds, along with EEPS, SBC, and RGGI auction revenues.[53] Well-designed Green Bank products should work in tandem with the state's clean energy incentive programs, and ultimately result in more renewable energy generation per public dollar invested as the initial capital is repaid, augmented with fees and interest and reinvested, creating a self-sustaining vehicle to help the state achieve its clean energy goals.

49 Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Petition for Modification of Main Tier Program, filed (Dec. 14 2012).

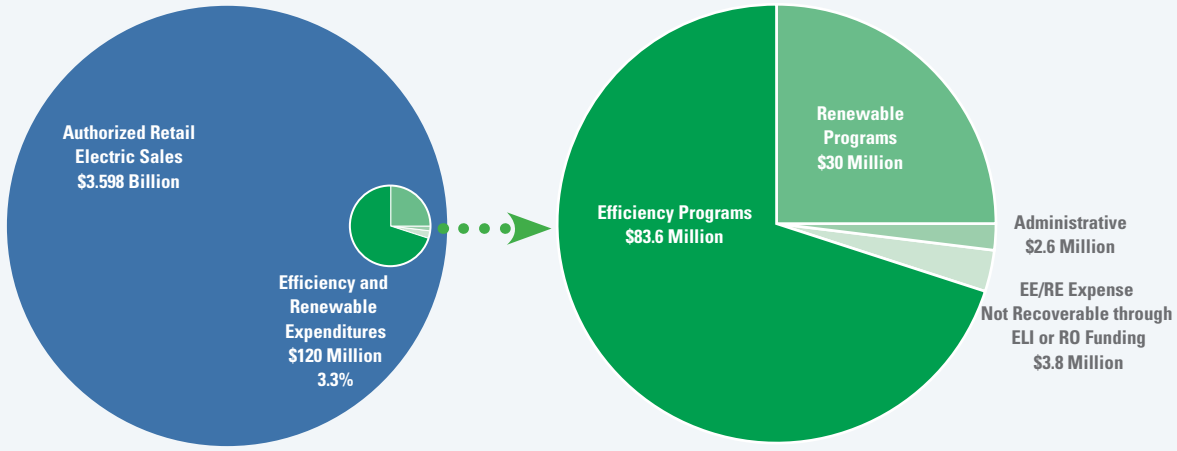
50 1,974 MW located in NY. (Although 3.8% had been awarded, only 2% is expected by the end of 2013) NYSERDA, The New York State Renewable Portfolio Standard Performance Report at 2 (2012).

51 United States Constitution Art III. sec. 8.; Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Proceeding on Motion of the Commission Regarding a Retail Renewable Portfolio Standard, Petition for Rehearing of H.Q. Energy Services(U.S.) Inc., filed (June 21, 2013).

52 Governor Andrew Cuomo, 2013 State of the State Address: NY Rising at 28 (Jan. 9 2013) available at http://www.governor.ny.gov/sites/default/themes/governor/sos2013/2013SOSBook.pdf (last visited Oct. 5, 2013); see also, Case 13-M-0142, Petition of the New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank, filed (Sept. 9, 2013).

53 Case 13-M-0142, Petition of the New York State Energy Research and Development Authority to Provide Initial Capitalization for the New York Green Bank, filed (Sept. 9, 2013). "NYSERDA proposes to use the $165.6 million to fund the initial operations of the Green Bank. These funds will be combined with $44.7 million in funds obtained through the sale of carbon dioxide allowances under the Regional Greenhouse Gas Initiative (RGGI) from the March, June, and September 2013 auctions, and may also include allocations from future RGGI auctions. NYSERDA will combine these sources to provide initial Green Bank capitalization in the amount of at least $210.3 million for the rollout of a series of initial financing products."

**FIGURE 7: LIPA's Spending on Clean Energy Compared to Total Sales**




## Net Metering and the RPS

New York's net metering policies enable customer-sited renewable generation to receive credit for the power supplied to the local utility, thereby capturing the full economic potential of the renewable energy system.[54] When a customer-sited installation is generating more electricity than is consumed onsite, the electricity meter essentially "spins backwards" to credit the utility account for the electricity supplied to the grid. With Governor Cuomo's NY-Sun Initiative encouraging investment in additional customer-sited solar PV installations and the state's consideration of the RPS beyond 2015, the importance of net metering will grow. With more distributed resources interconnecting, it will be increasingly important to ensure that New York's net metering laws and implementation by the PSC and regulated utilities facilitate rather than impede renewable project installation. Effective net metering laws, regulations, and enforcement will make projects more economical, increasing the return on each RPS dollar invested.

***The Governor's NY-Sun Initiative will increase Solar PV installations in the state.***

54 NY Pub. Serv. Law §§ 66-j, 66-l (McKinney 2011).

## Restructuring LIPA: The Fate of Clean Energy Programs Going Forward

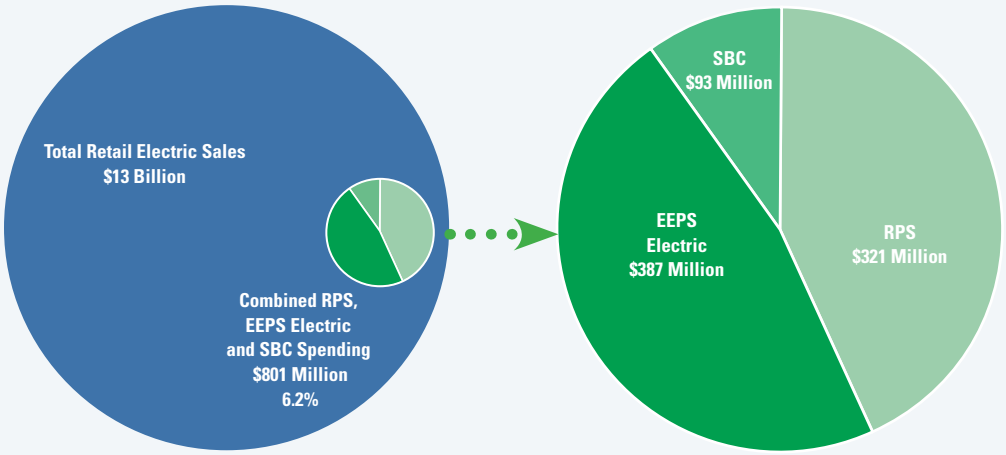
Historically the Long Island Power Authority (LIPA) has implemented energy efficiency and renewable energy programs similar to, but distinct from, the PSC jurisdictional portions of the RPS and EEPS. The overall renewables budget for LIPA in 2012 was $55 million and supported LIPA's customer-sited solar PV program, a 50 MW solar PV Feed-in-Tariff, as well as other wholesale renewable energy purchases that supply Long Island.[55] An additional 100 MW Feed-in Tariff was approved by the LIPA Board in September 2013, though the dollar number to support this initiative is not yet included in the renewables budget.[56] On October 19, 2013, LIPA issued a subsequent RFP for 280 MW of renewable projects.[57] Figure 7 depicts LIPA's 2012 renewable energy investments.

55 Important to note that a number of the wholesale "renewable" energy purchases by LIPA come from resources that are not eligible under the RPS as defined by PSC Order. See generally, Long Island Power Authority 2013 Approved Operating Budget, 2013 & 2014 Approved Capital Budgets, Five Year Financial Projections – 2013-2017 (2013) available at http://www.lipower.org/pdfs/company/investor/2013budget.pdf (last visited Oct. 5, 2013).

56 LIPA will be accepting applications on a first come, first served basis from October 2013-January 2014. http://www.lipower.org/fit/ See Expand Service Classification No. 11 – Buyback Service to include the purchase of additional solar photovoltaic generating resources at a fixed price for a specified term, LIPA proposed revised Tariff Leaf Nos. 254,255,255A, and 255C, (comments pending).

57 "LIPA is issuing this Request for Proposals for up to 280 MW of New, On-Island, Renewable Capacity and Energy ("RFP" or "280 MW RFP") for the addition of up to 280 MW of renewable energy, including all associated capacity and environmental attributes. While LIPA does not fall under the jurisdiction of New York State's renewable portfolio standard ("RPS"), LIPA has adopted a goal to strive toward incorporating a larger percentage of renewable resources in its resource portfolio." http://www.lipower.org/company/proposals/280MW.html

**FIGURE 8: New York's Clean Energy Collections as a Share of Total Sales (Excluding LIPA)**




## RPS, SBC and EEPS

While the RPS works to increase the supply of renewable electricity for consumers in the state, New York has two other essential clean energy policy tools: the System Benefits Charge (SBC) and the Energy Efficiency Portfolio Standard (EEPS). The EEPS helps to lower electricity demand through incentives for energy efficiency and the SBC works to transform the market to facilitate clean energy investment. In the process of lowering energy demand and reducing dependency on fossil fuels, the RPS, SBC, EEPS, and the soon to be established Green Bank programs work in concert to create jobs and other economic benefits for the state. Figure 8 shows the $810 million total budget of these programs and the respective allocation by program, relative to the roughly $13 billion annual electric sales by the state's six investor-owned utilities (LIPA's breakdown is also presented).

In response to public outcry over its poor performance during recent storm events and other public policy concerns, both houses passed Governor Cuomo's bill overhauling the structure of LIPA.[58] This comprehensive bill covers the entire spectrum of restructuring issues, from bonding protocols and service agreements with a utility provider—Public Service Electric and Gas (PSEG) beginning in 2014—to property taxes and board of trustees. While the law restructuring LIPA stops short of locking in specific dollar budgets for clean energy, it does include language that will guide decisions regarding renewable energy and energy efficiency investments on the service territory.[59] The newly created Department of Public Service office on Long Island, and new appointments to the board of trustees, will be responsible for ensuring that LIPA and its new utility contractor, PSEG, advance the state's RPS goals, and that those programs are effectively integrated with those in the rest of the state. Doing so will ensure market continuity for renewable energy developers and retain and expand the many local jobs the industry has created.[60]

***New Yorks renewable electricity market needs long-term stable support.***

58 Powers And Duties—Outstanding Debt—Long Island Power Authority, 2013 Sess. Law News of N.Y. Ch. 173 (A. 8073) (McKINNEY'S).

59 See Powers And Duties—Outstanding Debt—Long Island Power Authority, 2013 Sess. Law News of N.Y. Ch. 173 (A. 8073) (McKINNEY'S). (LIPA restructuring legislation passed both houses of the legislature on June 20, 2013).

60 In September 2013, LIPA's Solar Pioneer program ran out of funding. Governor Cuomo approved $5 million of RGGI revenues to serve as bridge funding to support the program through the end of the year. However, without action in the fourth quarter by LIPA and the state, these programs will face continued uncertainty for 2014 and beyond. See Press Release, NYSERDA, NYSERDA and LIPA Announce Funding to Restart the LIPA Solar Pioneer Program to Advance the NY-Sun Initiative $5 Million Allows Photovoltaic Incentives to Continue on Long Island (Sept. 16, 2013) available at http://www.lipower.org/newscenter/pr/2013/091613-solar.html (last visited Oct. 5, 2013).

# 4 Recommendations

## Lock in Funding and Targets for the Long-Term

In order to ensure continued private investment in renewables, New York must provide regulatory certainty. The RPS is currently set to expire in 2015, with no successor program or extension in place to continue New York's market transformation to a clean energy economy. New York should create program stability and certainty for renewable developers and their customers. To do this, the PSC and LIPA should establish robust, long-term dollar budgets to support renewable energy programs and drive increasingly cost-competitive renewables development across the state. Future annual dollar budgets should, at a minimum, be extended at 2015 levels; funding levels should be increased if analyses conclude it is in the interest of New Yorkers. The state should extend the RPS collections through 2025 with an interim 2020 target to ensure the state is on track to meet its goals. This would demonstrate the commitment for meeting and exceeding program goals, and would align with Governor Cuomo's ten-year NY-Sun Initiative. The ongoing energy efficiency and renewable energy potential studies commissioned for the State Energy Plan should be used to help inform the calculation of these 2020 and 2025 targets. Taking this action now is essential to provide the certainty necessary for the renewables industry to plan and invest in New York for the long term.

## Continue to Improve Transparency and Schedule Certainty for Developers

Uncertainty and irregularity of program offerings are recurring criticisms of the RPS.[61] While flexibility for program administrators to respond to evolving market conditions is important, more can be done to provide developers with a near-term schedule of offerings and solicitations. For the main tier this means avoiding repeated delays that have plagued those solicitations over the years. For the customer-cited tier an effectively implemented declining capacity block model currently under consideration for NY-Sun would be consistent with this recommendation.[62] Adopting and adhering to a regular solicitation schedule for a set multi-year period would reduce uncertainty in the renewables marketplace, reducing risk and lowering transaction costs, resulting in more MW of renewables installed per public dollar invested.

## Implement the Green Bank in a Manner that Complements Rather than Supplants Incentive Programs

A New York Green Bank will play a key role in scaling up renewables in New York. NYSERDA and the PSC should act quickly, but thoughtfully, to approve and develop this additional tool for the state's renewable energy and energy efficiency toolbox. The Green Bank should not seek to replace but rather work in concert with the state's most effective programs. In the September 2013 petition and in public statements, the Governor's energy team has emphasized that one of the Green Bank's guiding principles is to "[f]ocus on projects that are economically viable but not currently financeable." It is vital that this principle be interpreted expansively in light of the complex nature of the renewable energy market, rather than a narrow interpretation, which would result in missed opportunities and unnecessary constraints. The determination of economic viability of clean energy is dependent on projected energy prices, which in turn hinge on the price of other fuels as well as energy policies and regulations. Indeed, it is the hedge and diversification value of clean energy that makes it difficult to evaluate using traditional tools that tend to over-value low capital costs. The Green Bank should be used to appropriately value the long-term benefits renewables supply. In addition, when considering "viability" it is vital that the Green Bank and NYSERDA make the determination in conjunction with the state's other programs and policy goals in mind. Green Bank financing and NYSERDA incentives should fit hand and glove to achieve deployment, economic development, and market transformation goals.

61 A recent example of this has been NYSERDA not releasing contract awards for the eighth solicitation until the PSC ruled on the December 2012 petition to limit out-of-state contracts. Case 03-E-0188, In the Matter of a Renewable Energy Portfolio Standard, Petition for Modification of Main Tier Program, filed (Dec. 14 2012).

62 The declining capacity block model adopted by California involves providing an upfront schedule that provides a specified incentive for developers that declines over time in a stepwise manner as each block is filled, thereby reflecting the market declines in installations costs and ensuring efficient incentive levels. See California Public Utilities Commission, About the California Solar Initiative, available at http://www.cpuc.ca.gov/puc/energy/solar/aboutsolar.htm (last visited Oct. 17, 2013).

## Align Transmission and Distribution Infrastructure Investments with the State's Comprehensive Clean Energy Goals to Build a 21ST Century Grid

One of the biggest challenges to both utility-scale and distributed renewables deployment is how to efficiently integrate these variable energy resources into the grid. In the case of wind farms, aging upstate bulk system infrastructure limits the deliverability of projects where there may be an attractive wind resource. For distributed resources, such as solar PV and fuel cells, antiquated distribution systems, complicated permitting, and interconnection processes make installation technically and financially difficult. New York must build on recent progress in this area to ensure that all investor-owned utility investments in system upgrades—which can carry price tags in the hundreds of millions of dollars—facilitate rather than impede increased penetration of distributed generation. And as the PSC deliberates on bulk system investments as part of Governor Cuomo's Energy Highway initiative, it should emphasize projects that will help deliver upstate wind supply to demand centers downstate. Doing so will not only help the state achieve its RPS goals, but at a lower cost per project.

## Install All The Pieces Necessary To Deploy Offshore Wind In New York

As demonstrated by a number of recent studies, offshore wind has the potential to provide a significant amount of high capacity, emissions-free generation in close proximity to New York's highest demand centers downstate.[63] While this technology may not be up and running in the next couple of years, it is critical that NYSERDA, DOS, NYPA, LIPA, Con Edison, and Governor Cuomo collaboratively build on progress to date by establishing meaningful benchmarks that will result in an actual project interconnecting the grid by the end of the decade. In the immediate near-term, it is vital that NYPA move forward expeditiously with the federal lease process it has been pursuing via the Department of the Interior, Bureau of Ocean Energy

63 The volume of electricity delivered per MW installed for offshore wind is significantly higher than onshore due to the more consistent wind speeds across a broader number of hours at sea. For example, a 30 MW offshore wind project sited off Long Island would have a projected annual supply of 125,000 MWh annually, or enough to power 17,000 homes annually. Deepwater Wind, Block Island Project Overview, available at http://dwwind.com/block-island/block-island-project-overview (last visited Oct. 17, 2013); See also, New York Department of State Atlantic Ocean Study to Support Ocean Industries Development and Offshore Wind Energy (2013) available at http://www.dos.ny.gov/press/2013/atlantic7-10.html (last visited Oct. 17, 2013); See also National Renewable Energy Laboratory, U.S. Renewable Energy Technical Potentials: A GIS Based Analysis (2012) available at http://www.nrel.gov/docs/fy12osti/51946.pdf (last visited Oct. 17, 2013).

Management to secure leases for future offshore wind projects.[64] Of equal importance is for New York to provide secure revenue streams for offshore wind in the form of long-term Power Purchase Agreements (PPA) with NYPA and/or the investor-owned utilities or an Offshore REC or "OREC" program, as has been adopted by New Jersey and Maryland. The need for public support to drive offshore deployment is well documented. Because of the high capital costs and the constraints of the bank markets, virtually none of the approximately 5,000 MW of operating offshore wind farms in Europe have been financed without the participation of one or more public lenders. With very limited federal options existing and few prospects for new programs, the New York RPS and Green Bank are positioned to play a pivotal role in making offshore wind a reality in New York.[65]

Recognizing the limits on what can be achieved by a single state, it is vital that New York move ahead on its own while simultaneously pursuing a regional approach. As illustrated by its success driving the Regional Greenhouse Gas Initiative, New York could and should be instrumental in convening states across the region to explore how multi-state economies of scale could accelerate the establishment of an offshore wind industry. Achieving this scale would increase interest from the private sector, thereby securing projects at a lower overall cost for consumers.

## Work Left to do for Onshore Wind

It is generally accepted that there remains, in New York, roughly 2,000-2,500 MW of wind resources in locations where projects could be feasibly sited in the near-term.[66] The state should adopt both a near-term and longer-term strategy to capture this potential and maintain robust support for onshore wind. Through year-end 2015, this should entail ensuring the remaining main tier budget is effectively deployed by updating program design to reflect current market conditions—including considering a shift to a first come, first served standard offer for developers with contract terms beyond 10 years. Doing so would overcome what has been a problematic bidding process, and the appropriate incentive level could be informed by the substantial market discovery NYSERDA has gained over the past eight years. Beyond 2015, the state should consider more fundamental changes, including but not limited to an expanded role for PSC-approved PPAs or "contract for differences" between investor-owned utilities and developers.[67] Lessons learned from

64 Bureau of Ocean Management, New York Activities, available at http://www.boem.gov/State-Activities-New-York/ (last visitied Oct. 17, 2013).

65 For a detailed discussion of the foregoing, see Douglass D. Sims, "Fulfilling the Promise of U.S. Offshore Wind: Targeted State Investment Policies to Put an Abundant Renewable Resource within Reach." Natural Resources Defense Council. http://www.nrdc.org/business/files/offshore-wind-investment.pdf.

66 In its 2010 report Growing Wind, the NYISO concluded that the grid could accommodate 8,000 MW of wind without adversely impacting reliability or operations. The 2000-2500 MW number mentioned here reflects a subset of that universe that is in locations where it could more feasible be built for various reasons. New York Independent System Operator, Growing Wind, Final Report of the NYISO Wind Generation Study (2010) available at http://www.uwig.org/growing_wind_-_final_report_of_the_nyiso_2010_wind_generation_study.pdf (last visited Oct. 17, 2013).

67 A contract for difference provides a floating per MWh incentive (relative to wholesale

recent utility-scale procurements from surrounding states such as Massachusetts and Connecticut could help inform these deliberations. The question of who bears the risk of these investments and arriving at an appropriately balanced answer will be essential to arriving at a smart program design.

## Develop Programs and Policies that Expand Renewable Energy Opportunities to More Diverse Communities

Building on its strong commitment to net metering, New York should continue to explore new policies that expand opportunities for low-income customers, renters, and the multi-family building sector, among others, to participate in the state's renewables programs. One example is the growing adoption in other states of a "shared renewables" model, in which multiple customers can be aggregated and directly invest in an offsite project to meet their electric demand. The Interstate Renewable Energy Council (IREC) recently released information regarding model rules to guide the adoption of such programs.[68]

## Alternative Financing Mechanisms

Currently, master limited partnerships (MLPs) and real estate investment trusts (REITs) provide fossil generators valuable financing tools that are unavailable to the renewables industry. Expanding eligibility to renewables will result in lower costs and increase awareness of and political support for these technologies. Such a change will require regulatory and legislative action at the federal level. Potential Green Bank program offerings can drive standardization of projects to facilitate incorporation in these structures. In addition, enhancing existing mechanisms such as on-bill recovery and property assessed clean energy (PACE) so that they are available to all market sectors should be pursued in the near-term. New York should work with stakeholders to secure these key policy changes at both the state and federal level.

electricity prices) to the developer.

68 Interstate Renewable Energy Council, Inc., Model Rules for Shared Renewable Energy Programs (2013) available at http://www.irecusa.org/wp-content/uploads/2013/06/IREC-Model-Rules-for-Shared-Renewable-Energy-Programs-2013.pdf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## About Pace Energy and Climate Center

More than a think tank, the Pace Energy and Climate Center turns ideas into action. We believe thoughtful engagement of government and key stakeholders leads to better public policy. We conduct research and analysis on legal, regulatory and policy matters because thorough, objective analyses are essential to finding solutions to today's complex energy and climate change challenges. We bring decision makers and stakeholders together because achieving results often entails learning together and finding common ground. We are lawyers, economists, scientists and energy analysts, committed to achieving real-world progress.

### Photo Details and Credits

FRONT COVER: Maple Ridge Wind, 321 MW, Lewis County, by EDP Renewables North America (EDP)
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PAGE 2 AND 3: 50.5 kW Solar PV, Nassau County, by EnergyByChoice
PAGE 8: 14.9 kW Solar PV, Nassau County, by EnergyByChoice
PAGE 11: 2.7 mW Solar PV, Feura Bush, NY, by Constellation
PAGE 13: 5.4 kW Solar PV, Nassau County, by EnergyByChoice,
PAGE 17: GAL Manufacturing Solar PV, the Bronx, by SolarCity
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PAGE 20 AND INSIDE BACK COVER: 24.5 kW Solar PV, Nassau County, by EnergyByChoice.
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