

# **New York State Energy Research and Development Authority (NYSERDA)**

## **Operations and Accomplishments and Mission Statement and Performance Measurement Annual Report Fiscal Year Ended March 31, 2016**

*Pursuant to Public Authorities Law Section 2800(1)*

### **NYSERDA**

NYSERDA is governed by a board consisting of 13 members, including the Commissioner of the Department of Transportation, the Commissioner of the Department of Environmental Conservation, the Chair of the Public Service Commission, and the President and CEO of the Power Authority of the State of New York, who serve ex officio. The remaining nine members are appointed by the Governor of the State of New York with the advice and consent of the Senate and include, as required by statute, an engineer or research scientist, an economist, an environmentalist, a consumer advocate, an officer of a gas utility, an officer of an electric utility, and three at-large members.

### **MISSION AND VISION**

*NYSERDA's mission is to:*

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

*NYSERDA's vision is to:*

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.

NYSERDA strives to facilitate change through the widespread development and use of innovative technologies to improve the State's energy, economic, and environmental wellbeing. NYSERDA's programs and services provide a vehicle for the State to work collaboratively with businesses, academia, industry, the federal government, the environmental community, public interest groups, and energy market participants.

## **OPERATIONAL CHANGES AND NEW INITIATIVES**

### **Clean Energy Fund**

In June 2015, NYSERDA filed the Clean Energy Fund Information Supplement, paving the way for NYSERDA's ten year, \$5 billion Clean Energy Fund (CEF). Through the CEF, NYSERDA seeks to build on its success and momentum to meet evolving market and customer needs. NYSERDA has designed the CEF to pursue three long-term outcomes: thriving and self-sustaining clean energy industries able to operate without subsidies; greater levels of private capital invested in clean energy and jobs in New York; and significant reductions in greenhouse gas (GHG) emissions from the state's energy sector. This investment will be made across four program portfolios: Market Development, Innovation and Research, NY Green Bank (NYGB), and NY-Sun. NYSERDA designed these portfolios to complement the other pillars of the State's energy agenda, including the Reforming the Energy Vision (REV) Regulatory Proceeding, the Clean Energy Standard, and initiatives advanced by the New York Power Authority (NYPA).

The CEF will employ innovative solutions that remove barriers, solve customer needs and provide value. The CEF represents a shift in NYSERDA's strategies toward engaging market forces, and leveraging its capital through investments that lower soft costs and make clean energy more affordable and more accessible. Through the CEF, NYSERDA will continue to act as a catalyst for advancing energy innovation and technology, transforming New York's economy, and empowering consumers to make informed energy choices.

In positioning the organization for success under the CEF, NYSERDA is continuing to streamline operations to become more responsive, adaptive, and easier to work with. NYSERDA has also implemented intensive staff training around a strategic, market-based approach to identify and size market opportunities, and to uncover and address customer value propositions in a meaningful way.

### **76West Clean Energy Competition**

76West is a \$20 million competition designed to develop entrepreneurs and attract resources to build clean energy businesses and create jobs in the 11 counties that make up New York State's Southern Tier Region.

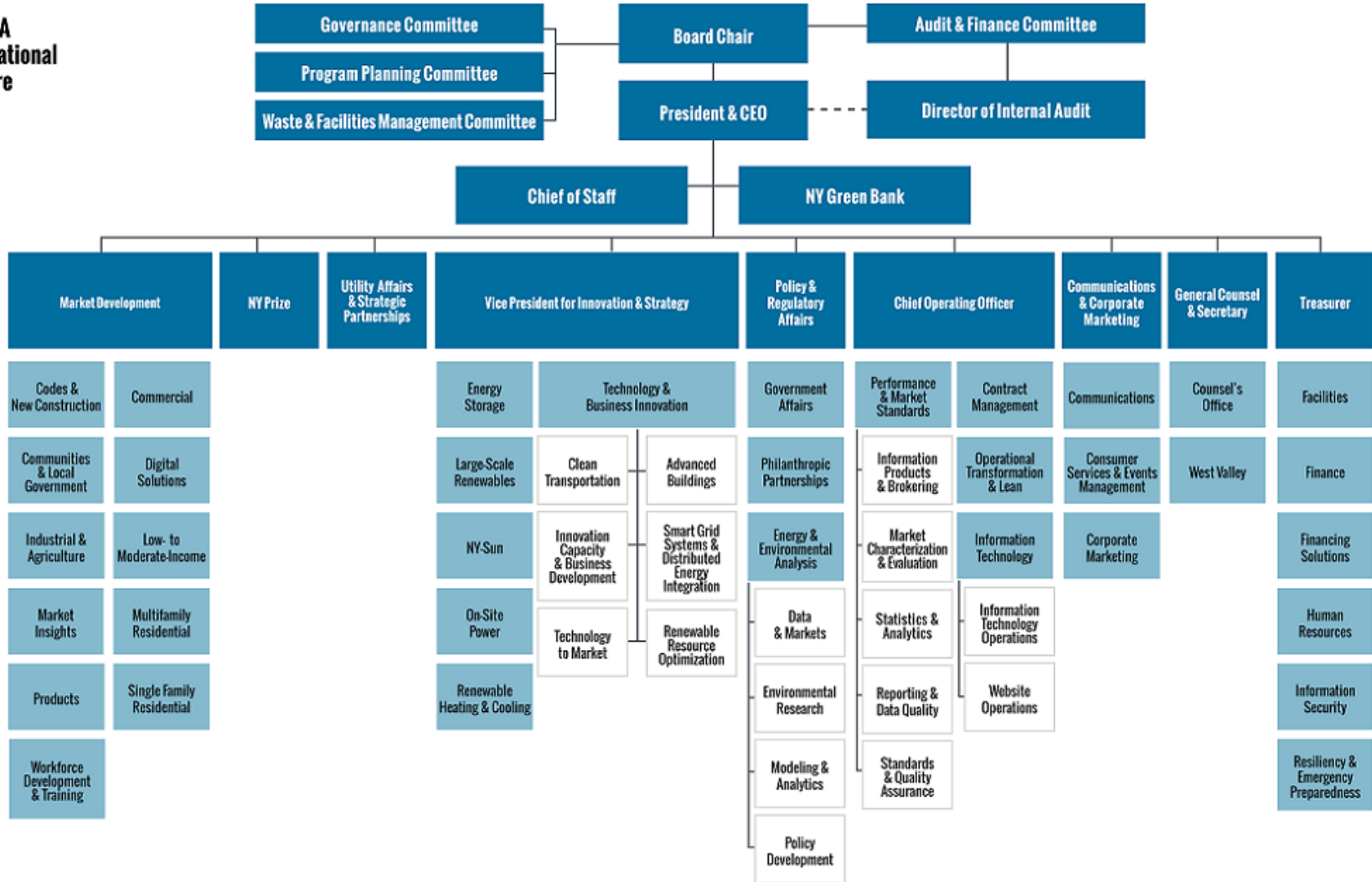
### **REV Campus Challenge**

The REV Campus Challenge promotes clean energy efforts by recognizing and supporting colleges and universities in New York State that implement clean energy projects and principles on campus, in the classroom, and in surrounding communities. Additionally, the REV Campus Challenge is administering the Energy to Lead Competition. The competition will challenge student-led coalitions across the State to develop creative ideas to aggressively reduce greenhouse gas emissions on school campuses and beyond. The three groups that propose the best ideas to invest in clean energy will each win \$1 million to help implement their plans.

### **Affordable Solar**

Affordable Solar doubles the incentives for each solar project installed at the home of a low- to moderate-income resident. The double incentives are available for residential solar projects for households earning less than 80 percent of the area or state median income, who often lack access to sufficient up-front capital to purchase a solar installation.

**NYSERDA  
Organizational  
Structure**



## PROGRAM ACCOMPLISHMENTS

NYSERDA’s activities are focused on achieving the five strategic goals/outcomes shown in Table 1. NYSERDA’s 2015 accomplishments are organized and reported in alignment with these five strategic outcomes.

**Table 1: Mission, Vision, Outcomes**

<b>Mission</b>	Advance innovative energy solutions in ways that improve New York’s economy and environment.				
<b>Vision</b>	NYSERDA’s vision is to serve as a catalyst – advancing energy innovation and technology, transforming New York’s economy, and empowering people to choose clean and efficient energy as part of their everyday lives.				
<b>Stakeholders</b>	New York energy users, businesses and institutions engaged in the clean energy economy.				
<b>Core Value</b>	NYSERDA will serve as a source of objective, credible information.				
<b>Goals / Outcomes</b>	<b>Efficient Use of Energy</b> NYSERDA provides energy solutions that reduce the energy consumption and increase the energy efficiency of New York’s residents and businesses.	<b>Diverse / Renewable Energy Resources</b> NYSERDA diversifies New York’s portfolio of energy resources by growing renewable and distributed generation resources and reducing petroleum use.	<b>Clean Energy Economy</b> NYSERDA catalyzes economic growth by supporting technology and business innovation and by developing a skilled clean energy workforce.	<b>A Cleaner Environment</b> NYSERDA reduces the environmental impact of energy production and use.	<b>Contract and Cycle Time</b> NYSERDA is responsive to customer needs – delivering accurate and timely information, services and programs

The five tables that follow (i.e., Tables 2 through 6) provide performance information for each of the five outcomes, including: data that describes NYSERDA’s annual incremental performance for calendar years 2014 and 2015, and the total achievement for all years through December 2014 and December 2015. Targets for calendar year 2016 are provided for performance measures where possible. The quantitative performance measurement data are supplemented with a brief bulleted list of 2015 accomplishments.

While the listed performance measures are used to evaluate NYSERDA’s progress toward goals, the measures are influenced by factors that are out of NYSERDA’s direct control, such as economic conditions, changes in energy markets and prices, and federal and state policy and funding decisions. The performance measures serve as indicators of NYSERDA’s progress in the context of these external factors.

**Table 2: Performance Measures - Efficient Use of Energy**

<b>EFFICIENT USE OF ENERGY</b>						
<i>NYSERDA provides energy solutions that reduce the energy consumption and increase the energy efficiency of New York's residents and businesses.</i>						
Performance Measures	ACHIEVED CY 2014 Addition	Total at end of 2014	TARGET CY 2015	ACHIEVED CY 2015 Addition	Total at end of CY 2015	TARGET CY 2016
<b>Electricity<sup>1</sup> (GWh) saved</b> due to improved energy efficiency in New York's buildings and facilities.	546	6,901	343	476	7,378	420
<b>Fossil Fuels<sup>1</sup> (MMBtu) saved</b> due to improved energy efficiency in New York's buildings and facilities.	1.5	12.1	1.1	1.7	13.8	2.0
<b>Number of New York households served.<sup>2</sup></b>	94,383	661,093	100,000	63,498	724,591	151,000
<b>Number of commercial and industrial customers served.</b>	3,358	31,878	1,453	3,412	35,290	1,140
<b>Energy Bill Savings–</b>						
1) Annual direct energy bill savings realized by participating customers (Open programs only) <sup>3</sup>	\$97 million	\$419 million	\$51 million	\$89 million	\$508 million	\$71 million
2) Annual direct energy bill savings realized by participating customers (All programs)	\$86 million	\$1,062 million	**4	\$141 million	\$1,203 million	**4
3) Lifetime energy bill savings realized by participating customers per energy efficiency dollar spent by NYSERDA	**5	\$3	**4	**5	\$3.4	**4
<b>Number of net additional jobs created</b> as a co-benefit of NYSERDA's energy efficiency activities <sup>6</sup>	**5	5,791 <sup>5</sup>	**4	**5	6,004 <sup>5</sup>	**4

<sup>1</sup> Electricity and fossil fuel savings have been revised from previously reported values due to a change in the methodology for counting savings from the Systems Benefit Charge programs (SBC) and to correct data discrepancies discovered in 2012 Energy Efficiency Portfolio Standard (EPPS) reporting.

<sup>2</sup> Households served include ARRA appliance rebates and completed multi-family units

<sup>3</sup> Energy bill savings are shown separately for open programs and all programs. Energy bill savings for all programs reflect energy savings from System Benefits Charge funded New York Energy Smart and Energy Efficiency Portfolio Standard programs from Regional Greenhouse Gas Initiative (RGGI) programs. The New York Energy Smart Program closed in 2012 and is excluded from the open programs values.

<sup>4</sup>The measure will be monitored and reported but a target has not been set. NYSERDA has elected not to establish a target in cases where the measure is a function of a parameter that cannot be reliably predicted (e.g., energy costs) or in cases where the metric is new to NYSERDA.

<sup>5</sup> Not additive- annual analysis only

<sup>6</sup> Net additional jobs created are estimated using the Regional Economic Models, Inc. (REMI) Policy Insight™ model, and reflect the net macroeconomic impacts stimulated by the program activities. The estimated jobs impacts are largely driven by the additional purchasing power that results from the electricity and fossil fuel savings to customers, and also include

**Table 2a: Comparison Points- Efficient Use of Energy**

<b>Comparison Points</b>	
<b>Electricity (GWh)</b>	2013 Statewide sales of electricity - 147,895 GWh <sup>7</sup>
<b>Fossil Fuels (MMBtu)</b>	2013 Statewide natural gas and petroleum usage – 1,052 million MMBtu <sup>7</sup>
<b>Number of New York households served</b>	2013 Occupied Housing Units in NYS – 7,219,356 <sup>7</sup>
<b>Number of commercial and industrial customers served</b>	2014 Business Establishments in NYS – 536,890 <sup>8</sup>

**Highlights of Additional “Efficient Use of Energy” Accomplishments:**

- Through December 2015, NYSERDA achieved over \$9.1 billion dollars in lifetime energy bill savings through SBC and EEPS programs. For every one dollar in energy efficiency funds spent by NYSERDA, \$3.4 in energy bill savings were realized as a result of the energy efficiency improvements installed by customers participating in NYSERDA energy efficiency programs.
- Over the past 18 years, NYSERDA-administered energy efficiency programs have saved enough electricity to power 1,040,327 homes each year (i.e., 7,378,000 annual MWhs) and enough natural gas, propane, oil and other heating fuels to heat 176,911 homes each year (i.e., 13,799,000 annual MMBtu).
- Over 724,000 households and 35,000 commercial, industrial, and institutional customers have reduced their energy use and annual energy bills by participating in NYSERDA programs since 1999.
- From 1999 through 2015, more than 6,004 jobs were created as a co-benefit of NYSERDA’s SBC and EEPS-funded energy efficiency activities.
- NYSERDA completed a first-of-its-kind Residential Statewide Baseline Study, compiling data on over 3,000 residential buildings in New York. This study is informing Clean Energy Fund program design and key baseline statistics against which market development progress will be assessed.

---

the macroeconomic impacts of program expenditures, customer expenditures, lower sales by energy providers, and the opportunity costs of the program funds collected from ratepayers. The impacts of utility revenue decoupling are also accounted for across all years. The job figures represent the number of jobs that are estimated to exist as a result of cumulative program activity through the program year, relative to the number of jobs that would have existed in that year in the absence of the energy efficiency programs. The estimates of net jobs created are based on assumptions for average distributions of residential and commercial customer spending, and could be somewhat higher or lower in a given year depending on specific spending patterns, such as the proportions applied to pay off debt or to re-invest in a business.

<sup>7</sup> NYSERDA, Patterns and Trends, Energy Information Administration (EIA), 2013

<sup>8</sup> U.S.Census Bureau: State and County Quickfacts

**Table 3: Performance Measures – Diverse / Renewable Energy**

<b>DIVERSE / RENEWABLE ENERGY</b>						
<i>NYSERDA diversifies New York's portfolio of energy resources by increasing renewable and distributed generation resources and reducing petroleum use</i>						
<b>Performance Measures</b>	<b>ACHIEVED CY 2014 Addition</b>	<b>Total at end of 2014</b>	<i>TARGET CY 2015</i>	<b>ACHIEVED CY 2015 Addition</b>	<b>Total at end of CY 2015</b>	<i>TARGET CY 2016</i>
<b>Renewable resources electricity produced</b>						
1) Electricity Production (GWh) delivered to wholesale power market from incentivized installations	475	4,008	14.8	-8 <sup>9</sup>	4,000	**10
2) Electricity Production (GWh) from on-site installations	134	382	160	183	565	440
<b>Renewable resources number of operating installations</b>	7,462	16,538	12,501	11,430	27,968	15,500
<b>Petroleum Displacement (Thousands of gallons) in transportation sector</b>	20,629	115,073	8,669	9,300	124,373	9,500
<b>Solar PV capacity (GW) from on-site installations:<sup>11</sup></b>						
1) Under NY-SUN 3 GW goal	0.033	0.033	N/A <sup>11</sup>	0.105	0.138	0.280
2) For all NYSERDA funded solar PV programs, including 3 GW goal	0.113	0.256	N/A <sup>11</sup>	0.201	0.457	0.320
<b>Combined heat and power (CHP) electricity produced (GWh)</b>	56	879	43	23	902	43
<b>CHP number of operating installations</b>	11	133	29	18	151	29

**Table 3a: Comparison Points- Diverse/ Renewable Energy**

<b>Comparison Points</b>	
<b>Renewable resources electricity produced</b>	2013 Statewide sales of electricity - 147,895 GWh <sup>12</sup>
<b>Petroleum Displacement</b>	2013 Total Petroleum Use in Transportation Sector – 7.4 billion gallons <sup>12</sup>

<sup>9</sup> Decreased generation for 2015 is due to RPS Main Tier project attrition and contracts which have reached their terminus year, after which NYSERDA no longer has rights to claim the generation.

<sup>10</sup> NYSERDA has elected not to establish a 2016 target for renewable electricity production delivered to the wholesale power market due to the ongoing Clean Energy Standard proceeding (CASE 15-E-0302) through which future NYSERDA acquisition programs may be established.

<sup>11</sup> Solar capacity (GW) is a new measure in 2015. All NYSERDA funded solar PV is currently and historically included in "Electricity production (GWh) from on-site installations" and "Renewable resources number of operating installations."

<sup>12</sup> NYSERDA, Patterns and Trends, Energy Information Administration (EIA), 2013



**Highlights of Additional “Diverse / Renewable Energy” Accomplishments:**

- From 1999 through 2015, NYSERDA installed renewable generation at over 29,000 locations across New York State, primarily under the Renewable Portfolio Standard (RPS) Program.
- Through projects installed from 1999 through 2015, NYSERDA delivered 4,000 GWh of electricity production to the wholesale power market from incentivized installations. NYSERDA also delivered 565 GWh of electricity production from on-site installations.
- NYSERDA is helping to develop 68 large-scale renewable generation projects representing 2,137 MW of renewable generation capacity; 59 facilities are operating. The remainder of the projects are under design and construction.
- Through 2015, the use of nearly 124 million gallons of petroleum has been reduced in the transportation sector through introduction of alternative fuels and efficiency strategies for vehicles and transportation systems.
- New York State initiated a proceeding for a new Clean Energy Standard mandating that 50 percent of all electricity consumed in New York by 2030 result from clean and renewable energy sources.
- The New York Offshore Wind Cost Reduction Study was published, offering a roadmap of key strategic steps New York State can take to reduce costs of offshore wind power over the next decade.
- Through the launch of the NY-Prize microgrid competition 83 communities across New York State were each awarded \$100,000 to support innovative microgrid projects.

**Table 4: Performance Measures – Clean Energy Economy**

<b>CLEAN ENERGY ECONOMY</b>						
<i>NYSERDA catalyzes economic growth by supporting technology and business innovation and by developing a skilled clean energy workforce</i>						
<b>Performance Measures</b>	<b>ACHIEVED CY 2014 Addition</b>	<b>Total at end of 2014</b>	<b>TARGET CY 2015</b>	<b>ACHIEVED CY 2015 Addition</b>	<b>Total at end of 2015</b>	<b>TARGET CY 2016</b>
<b>Impacts of Product Development Activities –</b>	\$113 million	\$2,294 million	**14	N/A	Data lags by one year	**14
<b>1) Annual product sales<sup>13</sup></b>						
<b>2) Number of products in the market</b> as a result of previous technology and business development investment	10	339	25	37	376	15
<b>3) Ratio of GSP impact to NYSERDA investment in technology and business development<sup>15</sup></b>	**16	7.9 <sup>17</sup>	**14	**16	Data lags by one year	**14
<b>4) Number of net additional jobs created</b> as a result of the net macroeconomic activity stimulated by technology and business development <sup>18</sup>	**16	548 <sup>17</sup>	**14	**16	Data lags by one year	**14
<b>5) Number of new clean energy products in development<sup>19</sup></b>	N/A	142	152	N/A	215	145

<sup>13</sup>Annual product sales data lags by one year. For 2013, the most recent prior time period with data available, NYSERDA reported an addition of \$225 million in annual product sales.

<sup>14</sup>The measure will be monitored and reported but a target has not been set. NYSERDA has elected not to establish a target in cases where the measure is a function of a parameter that cannot be reliably predicted (e.g., energy costs)

<sup>15</sup>Gross State Product (GSP) impacts were estimated using a macroeconomic model called Policy Insight+, developed by Regional Economic Models, Inc. (REMI). GSP impacts include the effects of NYSERDA spending on product development activities; private monies spent on product development activities; and product sales that resulted from program activities. The negative GSP impact resulting from the collection of ratepayer funds was also incorporated

<sup>16</sup> Not additive- annual analysis only.

<sup>17</sup> These metrics are calculated using annual product sales, which lags by one year. In 2013, the most recent prior time period with data available, NYSERDA reported an 11.4 ratio and 603 net additional jobs. The decrease in results from 2013 to 2014 is due to changes in the REMI model itself, rather than decreases to model inputs.

<sup>18</sup> Net additional jobs created are estimated using the Regional Economic Models, Inc. (REMI) Policy Insight™ model, and reflect the net macroeconomic impacts stimulated by the program activities. The estimated jobs impacts are largely driven the production and sale of the new products resulting from this program activity. The job figures represent the number of jobs that are estimated to exist relative to the number of jobs that would have existed in that year in the absence of the program.

<sup>19</sup>Because product development efforts take years, the number of products in development is not cumulative, it is the total products in development at that time. The metric serves as an indicator of the degree of private sector engagement in NYSERDA's R&D program.

**Table 4: Performance Measures – Clean Energy Economy**

<b>CLEAN ENERGY ECONOMY</b>						
<i>NYSERDA catalyzes economic growth by supporting technology and business innovation and by developing a skilled clean energy workforce</i>						
<b>Performance Measures</b>	<b>ACHIEVED CY 2014 Addition</b>	<b>Total at end of 2014</b>	<b>TARGET CY 2015</b>	<b>ACHIEVED CY 2015 Addition</b>	<b>Total at end of 2015</b>	<b>TARGET CY 2016</b>
<b>Funding leveraged<sup>20</sup> by NYSERDA’s investment in technology and business development</b>	\$229 million	\$1,008 million	\$140 million	\$203 million	\$1,211 million	\$130 million
<b>Dollars invested by NYSERDA in technology and business development</b>	\$29 million	\$283 million	\$35 million	\$35 million	\$318 million	\$23 million
<b>Number of clean energy businesses receiving financial support</b>	N/A	185	185	N/A	175	150
<b>Number of patents, UL Listing certifications, license agreements, copyrights and other knowledge certifications</b>	14	95	**14	10	105	**14
<b>Number of workers trained in clean energy sectors<sup>21</sup></b>	6,522	40,642	10,404	13,082	53,724	5,995

**Table 4a: Comparison Points- Clean Energy Economy**

<b>Comparison Points</b>	
<b>Number of clean energy business receiving financial support</b>	2010 NYSDOL Green Jobs Survey - ~14,500 clean energy firms in NYS <sup>22</sup>

**Highlights of Additional “Clean Energy Economy” Accomplishments**

- As a result of NYSERDA’s technology and business development investments, there are over 376 new and improved clean energy products in the market, in all end-use energy sectors, from high-efficiency furnaces, to advanced lighting controls and hybrid electric buses.

<sup>20</sup> Leveraged funding includes co-funding and subsequent follow-on private funding. Data collection for follow-on private funding is an ongoing effort. The reported values represent an incomplete data set that will be supplemented in future years.

<sup>21</sup> Number of workers trained is a count of the occupied seats at training sessions. A worker that attends more than one training session will be counted more than once.

<sup>22</sup> The DOL and its research partners surveyed 20,000 businesses in late 2010 to determine the number and types of green jobs in the State, specifically companies that produce goods or services that increase energy efficiency or generate renewable energy. DOL results were gathered under four industry sectors – Construction, Component Manufacturing, Professional Services and Building Services. New York State Department of Labor. *New York State Green Jobs Survey*. 2010.

- NYSERDA has invested \$318 million dollars in business and technology development activities. An additional \$1,211 million in funds has been leveraged by NYSERDA's investment in business and technology product development.
- For every dollar invested by NYSERDA in product development, New York State realized approximately eight dollars in statewide economic and environmental benefits, including the creation of over 540 net jobs in 2014.
- NYSERDA's incubator program, which supports six cleantech incubators across the state, has assisted 141 clients and helped these startups raise over \$215 million in private capital as well as almost \$80 million of non-NYSERDA grant funding, while generating 980 jobs and bringing dozens of new clean energy and clean technology products to the market.
- 1366 Technologies announced it will locate its first large commercial Direct Wafer™ production plant in Alabama, Genesee County.

**Table 5: Performance Measures – A Cleaner Environment**

<b>A CLEANER ENVIRONMENT<sup>23</sup></b>						
<i>NYSERDA reduces the environmental impact of energy production and use.</i>						
Performance Measures	ACHIEVED CY 2014 Addition	Total at end of 2014	TARGET CY 2015	ACHIEVED CY 2015 Addition	Total at end of CY 2015	TARGET CY 2016
<b>CO<sub>2</sub> equivalent emission reductions</b> due to NYSERDA’s energy efficiency, renewable and diverse energy programs (annual metric tons) <sup>24</sup> <b>(Open programs only)<sup>25</sup></b>	341,132	2,092,966	239,157	343,731	2,436,698	558,802 <sup>26</sup>
<b>CO<sub>2</sub> equivalent emission reductions</b> due to NYSERDA’s energy efficiency, renewable and diverse energy programs (annual metric tons) <sup>24</sup> <b>(All programs)</b>	409,468	3,845,938	206,670	273,483 <sup>27</sup>	4,119,421	558,802 <sup>26</sup>
<b>NO<sub>x</sub> emission reductions</b> due to NYSERDA’s energy efficiency, renewable and diverse energy programs (annual metric tons) <sup>24</sup>	458	4,342	225	295	4,636	379
<b>SO<sub>2</sub> emission reductions</b> due to NYSERDA’s energy efficiency, renewable and diverse energy programs (annual metric tons) <sup>24</sup>	461	4,509	207	260	4,769	343

<sup>23</sup> Beginning in the 2016 Operations and Accomplishments and Mission Statement and Performance Measurement Annual Report, for consistency with NYSERDA’s Clean Energy Fund investment plans, all emissions reductions are reported in metric tons, revised from short tons in prior years. A metric ton is equivalent to 1.102 short tons.

<sup>24</sup> These emission reductions are associated with electric and fossil fuel energy efficiency measure savings and renewable generation. The associated electricity and fossil fuel savings have been revised from previously reported values due to a change in the methodology for counting savings from the Systems Benefit Charge programs (SBC) and to correct data discrepancies discovered in 2012 Energy Efficiency Portfolio Standard (EEPS) reporting.

<sup>25</sup> New York Energy \$mart Programs are closed. CO<sub>2</sub> reductions from open programs (EEPS, RGGI, and RPS) are shown separately.

<sup>26</sup> With the submittal of its Clean Energy Fund Investment Plan Budget Accounting and Benefits Chapter on February 22, 2016, NYSERDA adopted the NYS Public Service Commission’s recommendation in its January 21, 2016 Order Establishing the Benefit Cost Analysis Framework that New York’s GHG emissions factor methodology shift from an average grid emission profile to a marginal grid emission profile. Due to this shift, New York’s factor to calculate GHG emissions reductions has changed from 625 pounds CO<sub>2</sub>e/MWh to 1,160 pounds CO<sub>2</sub>e/MWh. The emissions reductions calculated for the 2016 targets reflect the new factor of 1,160 pounds CO<sub>2</sub>e/MWh.

<sup>27</sup> The 2015 CY addition of CO<sub>2</sub> reductions for all programs is lower than open programs due to the decreased contribution of new savings and the retirement of lighting and other installed measures from New York Energy \$mart projects.

**Table 5a: Comparison Points – A Cleaner Environment**

<b>Comparison Points</b>	
<b>CO2 equivalent emission reductions<sup>28</sup></b>	2013 Annual NYS Power Sector Emissions– 39.2 million metric tons CO2
<b>NOx emission reductions<sup>29</sup></b>	2011 Annual NYS Power Sector Emissions– 26,300 metric tons NOx
<b>SO2 emission reductions<sup>29</sup></b>	2010 Annual NYS Power Sector Emission– 43,500 metric tons SO2

**CY 2015 Energy-related environmental policies informed by NYSERDA reports / studies**

- Provided technical review of pellet boilers for Renewable Heat NY (RHNY). The U.S. Environmental Protection Agency (USEPA) has agreed to automatically certify pellet boilers accepted in the RHNY program. The New Source Performance Standard (NSPS) for Residential Wood Heaters went into effect in 2015 and allows for pellet boilers accepted by RHNY to meet Step 1 of the NSPS. This has allowed these manufacturers and their installers to avoid interrupted business and costly testing. There is a queue of more than a year at some test facilities and an estimated \$1 million in testing costs were avoided. It has also provided consumers a wide selection of high-efficiency and low emissions pellet boiler heating technologies. There are now 47 pellet boilers that meet the requirements for Qualified Technology under RHNY and the USEPA has automatically certified these pellet boilers until 2020.
- Briefed Massachusetts staff in the Clean Energy Center regarding RHNY. MA will automatically accept the RHNY Qualified Technologies into their biomass heating incentive program. Other states such as VT have also adopted the RHNY Qualified Technology list as part of their program and municipalities in other states have sometimes cited RHNY Qualified Technologies in their bid documents.
- Held a meeting for scientists and regulators in February 2015 at Syracuse University regarding the state of knowledge on mercury contamination in New York State fishes. Regulators and policymakers were informed of the newest data collected, ongoing fish monitoring work, and how physical conditions influence bioaccumulation of mercury. The meeting was also used to solicit feedback on additional sample collections and analysis needs going forward.
- Held a three-day workshop comprised of scientists, and regulators from NYS Department of Environmental Conservation (DEC) and USEPA in May 2015 to discuss regional modeling of inorganic pollutant depositions in New York State. The meeting was designed to provide policymakers with the current state-of-the-science on downscaling regional deposition models (e.g., CMAQ and AERMOD), and to seek feedback from policymakers on how to best communicate findings from ongoing pollutant models.
- Held a briefing with the NYS DEC to inform them of a new project to calculate Critical Loads for sulfur and nitrogen oxides. Project findings are expected to aid policymakers in an understanding of how much time, or emissions reductions will be required before impacted ecosystems in New York will recover from acidic deposition.
- Participated in the Community Risk and Resiliency Act (CRRRA) interagency working group. The 2014 ClimAID sea level rise projections will be adopted as the official State projections under CRRRA. Guidance developed by the working group will likely utilize a number of NYSERDA-developed tools to assist with implementation.

<sup>28</sup> NYSERDA, Patterns and Trends, Energy Information Administration (EIA), 2013

<sup>29</sup> NYS DEC 2011 Electric Generation Facility Emissions Data: Carbon Dioxide, Sulfur Dioxide and Nitrogen Oxides.

- Initiated research on stream debris loads during storms and new methods of identifying critical transportation infrastructure, both of which will assist NYS Department of Transportation (DOT) in prioritizing infrastructure under a changing climate.
- Initiated a project to compile a complete set of building footprint and critical infrastructure data for Long Island and all counties adjacent to the Hudson River, from the southern border of Westchester County to the Federal Dam at Troy. Such information will help local and regional decision-makers with policy decisions, impact assessments, planning efforts, and potential adjustments to local codes related to structure vulnerability under a changing climate.
- Two NYSERDA initiatives were cited in USEPA's *Clean Air Status and Trends Network (CASTNET) 2013 Annual Report (published in 2015)*.
  - NYSERDA's "Long-Term Monitoring (LTM) Assessment" (completed in 2013/2014), which used statistical analysis and stakeholder feedback to identify and recommend improvements to the current acid deposition and mercury long-term monitoring activities in New York State including: atmospheric deposition, lake chemistry, stream chemistry and hydrology, soil chemistry, biota and forest health.
  - NYSERDA and NYSDEC collaborated with the USEPA to increase certain types of atmospheric deposition monitoring to assure that NYS's Adirondack Park was included as a pilot location in the development of the EPA's Secondary Standards for the National Ambient Air Quality Standard (NAAQS).

Additional Policies Informed are included in the Accomplishments Section below. Policies informed prior to 2015 are included in the Cleaner Environment table in the FY ending March 31, 2016 Operations and Accomplishments Report.

**Highlights of Additional "Cleaner Environment" Accomplishments**

- NYSERDA's energy efficiency and renewable energy programs reduce the need for fossil fuel production of electricity and avoid associated emissions. For 2015, this equates to eliminating over 4,636 annual metric tons of NOx, 4,769 annual metric tons of SO2, and over 4.1 million annual metric tons of CO2 into New York's air – equivalent to removing approximately 867,002 cars from New York's highways.
- Governor Cuomo signed the [Under 2 MOU](#) (Memorandum of Understanding), an agreement between states, provinces and cities worldwide to affirm their commitment to help keep the earth's average temperature from increasing two degrees Celsius (or 3.6 degrees Fahrenheit) by 2100, as measured against pre-industrial levels.

**Table 7.1: Performance Measures – Invoicing Contract and Cycle Time**

<b><u>CONTRACT AND CYCLE TIME</u></b>					
<i>NYSERDA is responsive to customer needs – delivering accurate and timely information, services and programs</i>					
<b>Performance Measures</b>	CY 2013	CY 2014	TARGET CY 2015	CY 2015	TARGET CY 2016
<b>Invoice payment –</b>					
1) Number of invoices paid within 30 days	68,213 invoices	77,418 invoices	**30	95,557 invoices	**30
2) Percent of payments made within 30 days	99.99%	99.99%	100.00%	99.99%	100%

---

<sup>30</sup> The measure will be monitored and reported but a target has not been set. NYSERDA has elected not to establish a target in cases where the measure is a function of a parameter that cannot be reliably predicted (e.g., energy costs) or in cases where the metric is new to NYSERDA.



**Table 7.2: Performance Measures – Due Date Solicitation Contract and Cycle Time**

Due Date Solicitations						
Department Description	CY 2015 Contracts	CY 2014 Average of Total No. of weeks	CY 2015 TARGET Average Weeks	CY 2015 Average of Total No. of weeks	CY 2015 Median of Total No. of weeks	CY 2016 TARGET Average Weeks
NY-Sun	52	43	28	57	63	28
Commercial	4	44	28	50	51	28
Codes & New Construction	7	55	28	73	70	28
Industrial and Agriculture	-	50	28	N/A	N/A	28
Multifamily Residential	7	N/A	N/A	69	73	28
On-Site Power	13	50	28	40	40	28
Clean Transport.	37	51	28	57	53	42
All Other	189	35	28	41	37	28
<b>Total</b>	309	47		55	53	

**Table 7.3: Performance Measures – Open Enrollment and Task Work Order Contract and Cycle Time**

Open Enrollment and Task Work Orders						
Department Description	CY 2015 Contracts	CY 2014 Average of Total No. of weeks	CY 2015 TARGET Average Weeks	CY 2015 Average of Total No. of weeks	CY 2015 Median of Total No. of weeks	CY 2016 TARGET Average Weeks
NY-Sun	19,642	5	4	2	0	2
Commercial	741	9	6	16	10	6
Codes & New Construction	544	48	36	34	24	30
Industrial and Agriculture	438	25	20	27	4	20
Multifamily Residential	254	7	4	9	7	4
On-Site Power	118	19	15	18	13	15
Clean Transport.	1	18	15	9	9	15
All Other	1,067	6	4	15	5	4
<b>Total</b>	22,805	17	13	16	8	

# **PROGRAM OPERATIONAL UNITS**

## **Commercial**

Commercial works to spur innovation, investment and demand in clean energy and energy efficiency in New York's commercial existing building stock. Commercial will address overcoming market barriers to develop a well-functioning market for clean energy in the buildings sector with expansion of ESCOs servicing this market; customers positioned to invest in clean-energy projects via market-rate, long-term, self-sustaining financing options; use of cost-effective, technology-enabled tools, real time energy management, energy services, and clean energy marketplaces; deep, comprehensive efficiency projects occurring in all significant market segments.

## **Communities & Local Government**

Communities & Local Government provides a unified approach toward local energy action to better serve local communities' needs and advance clean energy policies statewide. Implement a common framework that enables communities to embed clean energy into their planning, helps facilitate and prioritize implementation, and recognizes/showcases community energy and sustainability actions.

## **Codes & New Construction**

Codes & New Construction works across the residential and commercial sectors, including multifamily and low-to-moderate income, to build market capacity, demonstrate value propositions, and disseminate credible information to drive the market to deep energy savings and zero net energy performance in construction and substantial renovation; address the safety and durability issues of buildings that meet or exceed future, increasingly stringent, energy codes; advance the energy code, improve design and construction practices, and promote zero net energy buildings to maximize carbon reductions; and increase compliance with the energy code and voluntary adoption of above-minimum codes and higher building performance standards.

## **Digital Solutions**

Digital Solutions seeks to accelerate the impactful deployment of digital and information technology solutions that improve the energy performance of distributed energy resources and energy consuming devices. Examples of promising digital products and solutions include wireless sensors, data analytics, advanced algorithms, energy management as a service, demand response, real time energy monitoring and systems controls, smart equipment, and digitally enabled tools (e.g. audit, modeling, measurement and verification, project development).

## **Industrial and Agriculture**

Industrial and Agriculture looks to advance the latest technologies and techniques to drive adoption of energy efficiency and process improvements through new strategies, including optimizing energy use and productivity and providing credible information toward integrating clean energy into the business mission of the industrial, data center and agriculture sectors.

## **Low-to-Moderate Income**

Low- to Moderate Income develops strategies and proposes policy, coordinating across all sectors and various New York State organizations to streamline and improve the effectiveness of the delivery of energy services to Low to Moderate Income households.

## **Multifamily Residential**

Multifamily Residential works to overcome market barriers in the multifamily sector (residential structures containing five or more dwelling units), pursuing strategies to: create awareness and demand for energy-efficient and high-performance buildings; increase market capacity to deliver energy services; stimulate consumer demand and choice to select energy and environmentally friendly buildings through clear and widely used labeling; expand the pool of trusted energy professionals serving the needs of multifamily building owners, their technical skill sets and tools; demonstrate viability of deep energy retrofits in multifamily affordable housing stock; and further the emergence of performance contracting.

## **Products**

Products conceptualizes, drives and implements strategies and interventions that accelerate the adoption of emerging or underutilized energy-relevant products by working to develop supply chains and service networks. Interventions are likely to include: support for product availability in relevant channels, support for channel and customer awareness, support for capacity development in key service networks (e.g. installation, maintenance).

## **Market Insights**

Market Insights supports work with actionable customer insights to help develop and guide strategy. Contributions will be critical as NYSERDA orients its programs increasingly toward overcoming barriers that prevent customers and other market participants from deploying more clean energy in New York. Market Insights will generate actionable customer insights relevant to programs, partners, and end-use customers, develop market research in partnership and support of multiple teams across NYSERDA to understand market barriers and develop insights on customer decision making leading to increased scale and adoption of clean energy, provide relevant intelligence to programs and work with colleagues to design and conduct targeted primary and secondary research from which to draw insights.

## **Single Family Residential**

Single Family Residential works to overcome market barriers towards the development of a robust, self-sustaining, market-based energy efficiency industry for the existing homes sector (residential structure containing 1-4 dwelling units); and facilitates the growth of demand for energy services.

## **Workforce Development & Training**

Workforce Development & Training enables workforce development and training where lack of a trained workforce is inhibiting growth of a particular energy industry, or where training is needed to perform critical functions; establishes energy training as a permanent and sustainable part of the community infrastructure; enables growth of jobs in disadvantaged communities.

## **Technology and Business Innovation**

Technology and Business Innovation facilitates the research, development and commercialization of new and innovative clean energy technologies that when deployed at scale will deliver meaningful reductions in greenhouse gas emissions. Technology and Business Innovation employs a comprehensive strategy that integrates and leverages direct investment in startup and established clean energy companies, establishes sustainable multi-use assets in the state, and fully engages important stakeholders such as researchers, established corporate entities and the investment community. Technology and Business Innovation's direct investments help to determine technical

feasibility, assess market opportunities, achieve key product development milestones, and validate new technologies at scale in “real world” applications. Strategic investments in statewide multi-use assets provide business incubation, manufacturing support, mentorship, and access to private sector investors and potential development and commercialization partners. Technology and Business Innovation’s overall strategy contributes toward the growth of a vibrant clean energy business ecosystem that delivers solutions to the state’s pressing environmental, energy and economic needs.

Technology and Business Innovation has five teams focused on:

- Smart Grid Systems and Distributed Energy Integration - Accelerate the evolution to a smarter more integrated grid that “enables” new value-added services in pursuit of efficiency, sustainability, reliability, resiliency, and affordability.
- Renewable Resource Optimization - Accelerate market adoption and realization of grid and consumer benefits from distributed and renewable resources.
- Buildings - Accelerate development of technologies and systems that can enable net zero energy buildings, deep energy efficiency retrofits and smart buildings - providing value and comfort to occupants and owners.
- Clean Transportation - Accelerate the movement toward an efficient, low-GHG emissions transportation system - enhancing the quality of life in communities across New York State.
- Innovation Capacity and Business Development – Catalyze and enable a vibrant, self-sustaining cleantech innovation ecosystem that will accelerate the pace and scale of clean energy innovation in NY and make NY the place for innovation.

### **Energy Storage**

Energy Storage will develop and implement a robust energy storage strategy that removes the most impactful barriers preventing adoption in the electric grid, buildings and transportation sectors. This will enable renewable generation to be used as “flexible resources,” increase electric system utilization and resiliency, flatten peak demand, and reduce petroleum dependence to help achieve the State’s greenhouse gas reduction goals. Initiatives will include targeting soft costs to reduce total installed cost, validating new financing and ownership models, participating in ratemaking and tariff design, removing safety and performance uncertainty, and developing and demonstrating new products and integrated systems including microgrids. These strategies will be delivered in conjunction with public and private organizations and other NYSERDA teams.

### **Large Scale Renewables**

The Large Scale Renewables team will sustain and expand the penetration of large scale renewables in New York and also support the development of New York’s next frontier of renewable resources including the offshore wind resource. The program will facilitate New York’s renewables voluntary market through the design and management of the New York Generation Attribute Tracking System, provide technical and pre-development assistance to reduce soft costs associated with the development of these assets, assess alternate energy market valuation for renewables, and enable the development of the next generation of renewable technologies including offshore wind. The team will also manage over \$1 billion in existing Renewable Portfolio Standard Main Tier contracts, actively engage in the assessment of and transition to a post-Renewable Portfolio Standard procurement and contracting approach, and assume a lead role in responsibilities that NYSERDA assumes under any successor programs.

### **On-site Power**

On-Site Power will direct its major focus on animating the market for individual buildings to adopt natural gas-fueled Combined Heat and Power systems that will run every day as well as during a grid outage. The team will also assist the Anaerobic Digester Gas marketplace and the fuel cell marketplace with identifying business models that can lead to self-sustaining markets. On-site Power will also seek to advance the market for hybrid on-site power systems.

### **Renewable Heating and Cooling**

Renewable Heating & Cooling will seek to enable a self-sustaining market for renewable heating and cooling solutions helping to increase the viability of net zero energy buildings in New York. Solar thermal, biomass heating and geothermal systems will be explored. Renewable Thermal will address barriers to market growth including low customer confidence, limited service providers, high upfront costs, significant soft costs, and variable performance data.

### **NY-Sun**

NY-Sun is a multifaceted approach that aims to lower energy costs for all New Yorkers by increasing solar power capacity and the efficiency and reliability of the electric grid. Public-private partnerships help make installing solar technology more affordable for all New Yorkers while scaling up New York's solar industry. In addition to the Solar Electric Program, the NY-Sun initiative has programs to help lower statewide solar soft costs including training for installers and public officials, a standardized permitting and interconnection process, customer aggregation, and consumer education.

### **Financing Solutions**

Financing Solutions will develop strategies for mobilizing private capital and market-based financing solutions to support scaled investments in clean energy across sectors and technology areas.

### **Resiliency and Emergency Preparedness**

Resiliency and Emergency Preparedness will innovate, develop and execute planning and strategies to manage NYSERDA responsibilities under the Governor's Fuel NY initiative, an integrated solution to ensure that New Yorkers have access to gasoline in a declared energy or fuel supply emergency, and will manage and execute the State Energy Emergency Plan.

### **Performance and Market Standards**

Performance and Market Standards is responsible for data-driven and actionable business intelligence to support program design, performance measurement and management, test-measure-adjust, and Authority reporting. It is also responsible for using information, standards and quality assurance to build consumer and investor confidence in clean energy technology solutions and investments.

Performance and Market Standards has teams with the following responsibilities:

- Reporting and Data Quality is responsible for Authority reporting (including NYSERDA metrics in the State Energy Plan, NY Performs and internal performance management reporting), visual analytics and data sets shared through Open NY, and data governance, classification, and tools that support data quality.
- Market Characterization and Evaluation is responsible for measuring the changes in energy use and technology deployment in market sectors over time and for the evaluation of programs through a variety of methods in order to provide actionable

information to NYSERDA's teams and the market about the success of NYSERDA interventions and programs.

- Pilot Design and Analysis is responsible for the rigorous application of methods to test-measure-adjust and statistical analysis.
- Quality Assurance and Standards is responsible for the development and use of standards and various approaches to market-based quality assurance for the purpose of making clean energy more investable.
- Information Products and Brokering is responsible for facilitating the development and use of market-based information solutions, platforms and applications to support market confidence and lower soft costs.

### **Energy and Environmental Analysis**

Energy and Environmental Analysis assists New York State policy decision-makers and stakeholders by objectively:

- Identifying and evaluating policy alternatives for addressing vital public needs related to the production, delivery and use of energy, and development of new technologies.
- Assessing the impact of energy and environmental policies, programs and technologies on the State's citizens, businesses, environment, and energy systems.
- Providing market intelligence across all energy and fuel types, including all energy systems, market participants and customer sectors.
- Assessing operational status of energy delivery and fuel storage infrastructure components and advising corrective actions as necessary to expedite return to full operational capacity.
- Assessing retail petroleum fuels and natural gas prices, supplies and production to enable analyses of and response to market conditions.
- Providing energy-related environmental accountability through analysis of long-term monitoring records and modeling.
- Evaluating the effectiveness of energy-related environmental protection strategies to support regulatory processes.
- Helping prioritize opportunities for mitigation and identifying cross-sector pollution control strategies.
- Coordinating the State's activities on nuclear energy matters including the regulation of radioactive materials, and monitoring low-level radioactive waste generation and management.
- Fostering informed energy planning through economic analysis and modeling of energy and environmental issues.

### **Government Affairs**

Government Affairs helps to develop and implement strategies to attain authority goals and advises executive management on policy positions. Government Affairs helps construct the legislative agenda for the authority and monitors legislative activities at the state and federal level.

Government Affairs works with the Governor's office, state executive agencies, state legislature, local governments, and the federal government on matters related to the authority's programs and activities. Government Affairs also collaborates with teams across NYSERDA relating to ongoing efforts of the authority to develop and build greater program awareness and outreach.

### **Philanthropic Partnerships**

Philanthropic Partnerships' goal is to identify, cultivate and develop partnerships with mission-driven organizations such as foundations and corporate philanthropy for the purpose of serving as co-investors in clean energy initiatives in communities throughout New York State.

### **NY Prize**

NY Prize is a first-in-the-nation \$40 million competition designed to engage communities in creating microgrids that benefit the utility grid during normal operating conditions and can function independently from the utility grid during times of emergency.

### **Utility Affairs and Strategic Partnerships**

Utility Affairs and Strategic Partnerships drives coordination and collaboration between NYSERDA and utilities as well as necessary partners to develop strategies, demonstration partnerships, programs, and market approaches that achieve Clean Energy Fund and Reforming the Energy Vision objectives. Utility Affairs and Strategic Partnerships ensures smooth market engagement among NYSERDA and utilities to achieve the goals of Reforming the Energy Vision and enable a distributed system platform.

### **Saratoga Technology + Energy Park® (STEP®)**

Owned by NYSERDA, the Saratoga Technology + Energy Park® (STEP®) is a knowledge community with resources for companies in the clean-energy field looking to expand in New York's Tech Valley. A 280-acre site, STEP is located in Malta, New York, and is approved for 1.25 million square feet of office, research and development, and light manufacturing space while maintaining 77% green space. By creating a foundation for innovative clean-energy companies to collaborate, STEP is playing a role in the growth of the clean-energy economy in New York State.

### **West Valley Site Management Program (WVSMP)**

NYSERDA has a major environmental responsibility through its stewardship of the West Valley site in Cattaraugus County. NYSERDA's WVSMP works with the U.S. Department of Energy (DOE) to conduct the West Valley Demonstration Project, a high-level radioactive waste solidification, decontamination, and decommissioning demonstration project. The unique state and federal partnership at West Valley was created by the U.S. Congress in 1980 through the passage of the West Valley Demonstration Project Act. The WVSMP is also responsible for the safe management of the remainder of the 3,300-acre Center, including the shut-down State-Licensed Disposal Area (SDA), a 15-acre disposal facility that contains 2.4 million cubic feet of radioactive waste that was disposed in the 1960s and 1970s.