

New York State Energy Research and Development Authority

Operations, Accomplishments, Mission Statement, and Performance Measurement Annual Report

Fiscal Year Ended March 31, 2022

Final Report | June 2022



NYSERDA

NYSERDA's Promise to New Yorkers:

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

Our Vision:

New York is a global climate leader building a healthier future with thriving communities; homes and businesses powered by clean energy; and economic opportunities accessible to all New Yorkers.

Our Mission:

Advance clean energy innovation and investments to combat climate change, improving the health, resiliency, and prosperity of New Yorkers and delivering benefits equitably to all.

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and Performance Measurement
Annual Report

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Pursuant to Public Authorities Law Section 2800(1)

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1 NYSERDA

The New York State Energy Research and Development Authority (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.

2 Mission, Vision, and Promise

Our Vision: New York is a global climate leader building a healthier future with thriving communities; homes and businesses powered by clean energy; and economic opportunities accessible to all New Yorkers.

Our Mission: Advance clean energy innovation and investments to combat climate change, improving the health, resiliency, and prosperity of New Yorkers and delivering benefits equitably to all.

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

3 Operational Changes and New Initiatives

This section begins with information on major clean energy policies that were enacted in 2021 and represent key drivers and context for NYSERDA's programs. This section continues to include a description of each new or significantly modified initiative in NYSERDA's portfolio, including several that build upon prior offerings.

3.1 Public Policy Context

The Climate Leadership and Community Protection Act (Climate Act) was signed into law in 2019 as one of the most ambitious climate laws in the world. The law created the Climate Action Council (the Council), which is tasked with developing a Draft Scoping Plan that serves as an initial framework for how the State will reduce greenhouse gas emissions and achieve net-zero emissions, increase renewable energy usage, and ensure climate justice. On December 20, 2021, the Council voted to release the Draft Scoping Plan¹ for public comment. January 1, 2022, marked the beginning of a comment period to receive feedback from the public as the Council works to develop and release a final scoping plan by the end of 2022. The Draft Scoping Plan scenarios advance several key strategies that are fundamental to achieving the emission limits including:

- Energy efficiency measures that achieve the Climate Act energy efficiency goal
- Transition from fossil fuels to electrification in buildings
- Zero emissions electricity
- Transportation electrification
- Enhancement of transit, smart growth, and reduced vehicle miles traveled (VMT)
- A transition to low-GWP refrigerants and enhanced refrigerant management
- Maximizing carbon sequestration in New York's lands and forests
- Eliminate fugitive methane emissions across the waste, agriculture, and energy sectors
- A diverse portfolio of solutions in industry, including efficiency, electrification, and limited and strategic use of low-carbon fuels and carbon capture technologies for certain industrial applications.

¹ <https://climate.ny.gov/-/media/Project/Climate/Files/Draft-Scoping-Plan.pdf>

Additionally, in the State of the State on January 5, 2022, Governor Kathy Hochul announced a plan to strengthen New York's renewable energy leadership and make a nation-leading \$500 million investment in offshore wind. This plan will directly invest in offshore wind manufacturing and supply chain infrastructure, create thousands of good-paying green jobs, deliver billions in economic impact, and generate enough energy to power millions of homes.

Governor Hochul's offshore wind plan will build on more than 6,800 direct high-paying jobs, a combined economic impact of \$12.1 billion statewide, and more than 4.3 gigawatts of energy, which is enough to power nearly 3 million New York homes, representing half of New York's 2035 goal. To cement New York's national leadership in offshore wind energy, Governor Hochul will:

- Invest \$500 million in critical offshore wind infrastructure
- Procure enough new offshore wind energy to power at least 1.5 million homes and create at least 2,000 new jobs
- Initiate planning for a future offshore wind transmission network to power 4 million New York City homes
- Launch the Offshore Wind Master Plan 2.0 Deep Water

Governor Kathy Hochul also announced a plan to achieve 2 million climate-friendly, electrified or electrification-ready homes by 2030 and proposed legislation to ensure that all new building construction reaches zero-emissions by 2027. This unprecedented commitment to curb building emissions, which cause more than one third of New York's climate pollution, will also ensure that more than 800,000 low-to-moderate income households can secure clean energy upgrades. Governor Hochul will also direct the Department of Public Service to ensure that gas utilities minimize investments in costly new gas infrastructure, promote alternatives to minimize gas demand, and engage members of disadvantaged communities fully and fairly in the gas transition. This commitment is part of the Governor's comprehensive agenda to decarbonize buildings in New York, which also includes bringing green energy solutions to over 1,000 public schools.

On March 24, 2022, the Governor announced that New York has signed a multi-state agreement, including with an initial group of 40 hydrogen ecosystem partners, to develop a proposal to become one of at least four regional clean energy hydrogen hubs designated through the federal Regional Clean Hydrogen Hubs program included in the Bipartisan Infrastructure Investment and Jobs Act. The New York-led consortium includes Connecticut, Massachusetts, and New Jersey – longstanding

leaders in hydrogen and fuel cell innovation, and key neighbors on the I-95 corridor – as the first out-of-state partners to join the regional effort, opening the door for future state additions. The announcement advances each States’ leadership in clean hydrogen infrastructure deployment and research and development and supports New York’s Climate Leadership and Community Protection Act goal to reduce greenhouse gas emissions 85 percent by 2050.

3.2 Large-Scale Renewables

In January 2020, NYSERDA submitted a petition with the Public Service Commission (PSC) requesting authority to conduct a 2020 solicitation for at least 1,000 MW of Offshore Wind Renewable Energy Credits, with flexibility to accept bids up to 2,500 MW. On April 23, 2020, the PSC issued an order approving NYSERDA’s petition. In its evaluation process, NYSERDA was required to consider the costs and benefits of procuring from a range of project proposals that may reflect a variety of project capacities and economic benefit proposals, including port infrastructure investments. In July 2021, NYSERDA issued the second solicitation² seeking to procure Offshore Wind Renewable Energy Certificates associated with 1,000 megawatts or more of offshore wind energy, coordinated with a potential \$400 million opportunity in public and private investments in port infrastructure.

In January 2021,³ NYSERDA selected two offshore wind projects for contract negotiation under its second solicitation for offshore wind, Empire Wind II and Beacon Wind from Equinor Wind US LLC (Equinor). Combined, the projects total nearly 2,500 megawatts and leverage almost \$3 of private funding for every \$1 of public funding for a combined \$644 million in investments for resilient port facilities in the Capital Region and Brooklyn.

In January of 2022, NYSERDA finalized OREC purchase contracts with Equinor for Empire Wind II and Beacon Wind. NYSED also commenced the permitting process for offshore wind tower manufacturing at the Port of Albany and Brooklyn Marine Terminal for a project staging facility.

² Purchase of Offshore Wind Renewable Energy Certificates; Request for Proposals ORECRFP20-1. <https://portal.nyseda.ny.gov/servlet/servlet.FileDownload?file=00Pt0000000OPfCVEA1>

³ NYSERDA 2021 Announcements. <https://www.nyseda.ny.gov/About/Newsroom/2021-Announcements/2021-01-13-Governor-Cuomo-Outlines-2021-Agenda-Reimagine-Rebuild-Renew>

With this combined portfolio, NYSERDA has procured more than 4,186 MW with an additional 132 MW contributing to the grid via the LIPA procurement of the South Fork Wind project (a joint venture of Orsted and Eversource Energy). The South Fork Wind Farm received final permitting approval in early 2022, construction is under way, and it is expected to enter operation in late 2023, thus providing the first offshore wind generated electricity to New York State in 2023. This robust portfolio of offshore wind projects is currently supported by five State ports contributing to the localization of supply chain and economic benefits via two manufacturing facilities on the Hudson River—the Ports of Albany and Coeymans, a premier sixty acre staging and assembly port at South Brooklyn Marine Terminal, and operations and maintenance hubs at Port Jefferson and Port of Montauk on Long Island, NY.

The PSC’s 2020 CES Order established a new Tier 4 within the CES aimed to increase the penetration of renewable energy in New York City and thereby reduce reliance on fossil fuel generation in this densely populated area. NYSERDA issued its first Tier 4 solicitation in January 2021, which received bids from seven proposers for seven projects with 35 alternative configurations, representing nearly 7,500 megawatts of new renewable transmission capacity – nearly five times the capacity sought through the solicitation. In April 2022, the New York State Public Service Commission approved contracts with Clean Path New York LLC for its Clean Path NY project and H.Q. Energy Services Inc. for its Champlain Hudson Power Express project to deliver clean, renewable solar, wind and hydroelectric power from upstate New York and Canada to New York City. The selected projects are expected to deliver 18 million megawatt-hours of clean energy per year, or more than a third of New York City’s annual electric consumption, from a diverse and resilient clean generation portfolio including onshore wind, solar, and hydroelectric power, backed by energy storage, from upstate New York and Quebec.

3.3 NY-Sun

On April 14, 2022, the Commission issued an Order in response to the Distributed Solar Roadmap, which was filed jointly on December 17, 2021, by NYSERDA and the staff of the New York Department of Public Service (DPS). The Order extended NY-Sun’s goal from 6 GW of distributed solar by 2025 to 10 GW by 2030. It authorized an additional \$1,473 million in program funding to support the deployment of the incremental 4 GW. The Order included funding for additional base incentives for the Upstate Commercial/Industrial block design, and for residential and nonresidential base incentives in Con Edison territory, as well as funding for project incentive adders (including the Community Adder), and over \$251 million to expand the Solar Energy Equity Framework (SEEF). The Order also instituted a new prevailing wage requirement for projects larger than 1MW and authorized \$239 million in incentive funds to enable an industry transition to prevailing wage.

3.4 Equity for Disadvantaged Communities

The September 2021 CEF Order set a target for NYSERDA to achieve 40% of the benefits of investment across the entire CEF portfolio in disadvantaged communities (DACs). In early March 2022, New York State released draft Disadvantaged Community Criteria to advance climate justice. The Criteria were developed by the Climate Justice Working Group and will be subject to a 120-day public comment period before being finalized and applied to State programs. In the meantime, NYSERDA is increasing focus on DAC investments across the CEF portfolio: investing in capacity building and engagement within frontline and underserved communities through initiatives such as the Regional Clean Energy Hubs; prioritizing the funding of projects benefitting disadvantaged communities through initiatives such as NY Sun and the introduction of geographic eligibility through EmPower NY; and increasing investment in affordable housing. Through continued engagement with market actors serving disadvantaged communities and with input from residents, NYSERDA will continue to evolve sector strategies to maximize benefits to disadvantaged communities.

Consistent with discussions at Climate Justice Working Group and the Climate Action Council, NYSERDA expects that direct programmatic investments (dollars) in DACs will be the primary metric for compliance with the Climate Act investment mandate. Other co-benefit metrics beyond dollars invested will also be tracked and reported as part of a benefits framework that is currently under development by NYSERDA in collaboration with Department of Environmental Conservation, Department of Public Service and other state agencies and authorities. This framework is expected to be finalized so that the first benefits reporting can commence in late-2022. In the interim, NYSERDA has worked to increase the use of geo-coding of project-level investments in its portfolios, which will support ongoing management of the portfolio to meet the DAC investment target as well as accurate, transparent progress reporting.

3.5 Clean Energy Fund

During 2021, NYSERDA accomplished several key milestones related to the ongoing management of CEF portfolios, including the development of two new initiatives (EV Charging & Engagement and Natural Carbon Solutions) as well as modifications to several existing initiatives. This section describes

the evolution of the CEF portfolio, which began with the first initiatives introduced in 2016⁴ and continued to build in 2021.

The September 9, 2021, CEF Order adopted a set of revised, acquired-based targets (vs. the previous commitment-based targets) for CEF benefits to be achieved by 2025 and 2030. This change was adopted to place greater emphasis on putting money to work and acquiring benefits. The Commission found that this will further align the CEF metrics with those required of the investor-owned utilities for energy efficiency and building electrification programs, thereby making it easier to track our total progress across all ratepayer funded programs. Additionally, new targets were intended to align well with New Efficiency: New York expectations for energy savings, as well as Climate Act goals such as renewable energy.

In addition and pursuant to the Commission’s September 9, 2021 Order, NYSERDA prepared and filed the first “Compiled Investment Plan” (CIP) in accordance with the Department of Public Service Staff (Staff) guidance and in keeping with the Commission’s priority to “clearly describe a sound investment strategy identifying the level of funding over the period the activities will be undertaken, the projected outcomes/milestones, and how NYSERDA plans to verify the outcomes, and the impact of the various initiatives.” The CIP evolved from the former investment plan format which contained 27 Chapters and nearly 1,000 pages of plan content. The new format organizes NYSERDA’s Market Development and Innovation & Research initiatives into Focus Areas (sectors or strategic groupings of sectors) and streamlines the content to make it easier for stakeholders to understand NYSERDA’s investments and expected outcomes.

The following sections provide a description of significant changes proposed or approved in the reporting year, although some, but not all, have been launched in this period.

3.5.1 Buildings Innovation

NYSERDA’s Buildings Innovation work is focused on accelerating the development and commercialization of innovative solutions that enable carbon neutral buildings in New York State – that is, buildings that are highly energy efficient, use low-to-no-carbon fuels, and are capable of interacting with the current and future electric and thermal energy grids. This focus area addresses

⁴ <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={B23BE6D8-412E-4C82-BC58-9888D496D216}>

both existing and new buildings. Climatetech Commercialization Support was previously filed within the broader scope of the CleanTech Startup Growth initiative, which has been split into four smaller initiatives to improve clarity for stakeholders. In addition to supporting the Buildings Innovation focus area, Climatetech Commercialization Support also supports the Technology to Market focus area. The initiative previously approved as NextGen HVAC has been renamed NextGen Buildings. The initiative was modified in 2022 to add an additional \$20 million to fund a Building Envelope and Thermal Storage scope to this initiative. This initiative also supports a new Intelligent Buildings program.

3.5.2 Clean Heating and Cooling

Clean heating and cooling (CH&C) technologies have the potential to contribute significantly to the decarbonization of the heating and cooling sector. Benefits to customers who implement clean heating and cooling technologies include energy bill savings, increased comfort levels, and health benefits, compared to conventional heating and cooling technologies. Activities within this plan (specifically Community Campaigns and Clean Thermal District Systems) seek to increase viable and scalable solutions for electrifying homes in disadvantaged communities while addressing energy affordability, institutional barriers unique to affordable housing, and consumer protections. The Heat Pumps Phase 1 (2017) initiative is now inactive with funding reduced to by \$8.3M; \$6.8M has been shifted to Heat Pumps Phase 2 to support Consumer Awareness and Critical Tools Development with another \$1.5M to be used for future programming needs. \$6M in funding for Community Campaigns within Heat Pumps Phase 2 (2020) has been shifted to Regional Clean Energy Hubs to support Electrification campaigns under this Low-to-Moderate Income Focus Area plan. The results of all budget changes to Heat Pumps Phase 2 (2020) is a net increase of \$0.8M.

3.5.3 Clean Transportation Innovation

The Clean Transportation Innovation focus area seeks to support the development and demonstration of new technologies, policies, and strategies to reduce greenhouse gas emissions from the transportation sector and to gain market traction for these products. Activities are designed to harness stakeholders' creative solutions to New York State's transportation energy use challenges, facilitate the development of these solutions into products or services that are commercially viable, demonstrate their benefits to critical stakeholders, and research, identify solutions for and resolve any barriers to adoption that might

prevent these solutions from being adopted. The Electric Vehicle Innovation initiative added \$8 million of funding in 2021 for a project to be selected through the New York Clean Transportation Prizes program and later added \$12M in 2022 to fund new activities regarding medium- and heavy-duty vehicle electrification, managed charging, and EV policy development.

3.5.4 Codes, Standards, and Other Multisector Initiatives

This focus area encompasses a portfolio of multisector initiatives that include both regulatory efforts and market and utility innovation efforts, both of which focus on approaches that can scale building decarbonization in New York. Pre-investment strategy work and research is also conducted under this focus area benefiting all Market Development efforts. The regulatory initiatives include building codes, product standards, existing building performance standards, and reporting requirements. Pre-investment strategy work and research is also conducted under this focus area benefiting all Market Development efforts. Collectively these initiatives are critical to achieve decarbonization of buildings in an environment where fossil fuel systems are readily available and inexpensive in comparison to those that use electricity. The regulatory initiatives are intended to grow the size and scale of the market for heat pumps, geothermal systems, high-performing building envelopes, and other key clean energy technologies, by constraining the business-as-usual market for inexpensive fossil fuel heating and encouraging installation of electric technologies and other efficiency actions particularly at the time of replacement.

The “Code to Zero” initiative has been renamed “Codes and Standards for Carbon Neutral Buildings,” adding \$36 million to extend codes and standards work to future code cycles and address additional work identified by the Climate Action Council. The Information Products and Brokering initiative’s budget has been reduced by \$3 million to redeploy this funding towards other Market Development priorities. As such, the scale of web-based tools to support customer targeting and customer value proposition has been adjusted appropriately. Product and Appliance Standards has been allocated an addition \$4 million to extend its work and improve coordination with the federal government and other states.

3.5.5 Energy Focused Environmental Research

Since its inception in 1998, NYSERDA’s Energy Focused Environmental Research work has provided sound, current, scientific research to inform decision-making relevant to energy-related environmental policies and goals. NYSERDA relies upon its Program and Science Advisors, a network of professional contacts and topically developed working groups of science, policy, and in some cases, industry experts,

to identify critical gaps and research needs in New York State. These individuals and entities provide guidance on the major issues and challenges associated with achieving energy proposed or adopted energy policies and provide cutting-edge scientific understanding of how research can be designed to inform the policies. An additional \$10 million in funding has been added to Energy-Related Environmental Research to support ongoing research.

3.5.6 Grid Modernization

NYSERDA's Grid Modernization focus area invests in technologies, tools, and processes that accelerate realization of a reliable, resilient, and equitable electric grid that is necessary to achieve New York State's Climate Act goals. NYSERDA also invests in solutions to drive customer engagement, grid and microgrid resilience, alternative ownership models, and other investments required to support the goals of the Climate Act. The State's investment in innovation is needed to optimize, validate, standardize, and replicate these solutions for widespread deployment in the market. The initiative previously filed as High-Performing Electric Grid has been broken out to improve clarity for all stakeholders. Two initiatives, Future Grid Performance Challenges and Grid ClimateTech Ready Capital, were previously filed as a component of the "High Performing Grid" initiative and now have separate plans. The High-Performing Electric Grid initiative remains, now with a refined scope in association with the other two initiatives.

3.5.7 Multifamily Residential

The multifamily market is highly varied, fragmented, and complex. Variations include the age of the buildings, state of repair, energy performance, ownership and decision-making structures, energy cost/consumption accountability and control, housing regulations, and the complexity or simplicity of building systems. New York State's existing multifamily building stock houses 24% of the State's population, comprised of 2.5 million dwelling units—1.7 million affordable (66%) and 0.8 million market-rate—and accounts for 21% of the State's energy consumption. Most housing units are in the New York City metropolitan area and therefore subject to greenhouse gas emissions limits under NYC's Local Law 97 of 2019.

Serving the affordable multifamily market is a top priority for NYSERDA. In July 2020, NYSERDA and New York State's investor-owned utilities jointly announced the Statewide Low- and Moderate-Income (LMI) Portfolio Implementation Plan a collaborative partnership and investment of nearly \$1 billion through 2025 to increase access to energy efficiency and clean energy solutions for

low-to-moderate income (LMI) households and affordable multifamily buildings, through new, streamlined LMI incentive programs, community-based outreach and capacity building, and other resources. NYSERDA has increased funding for the LMI Multifamily initiative, investing in “direct injection” partnerships with Housing Agencies.

The Multifamily initiative has been renamed Multifamily Low Carbon Pathways and the funding for this initiative has been reduced by \$12.5 million to reflect pilot scope of work that did not advance.

3.5.8 Negative Emission Technologies

Negative Emission Technology (NET) describes approaches that remove carbon dioxide emissions from the atmosphere and includes engineered and nature-based solutions. Examples include carbon storing products, such as for buildings that increase energy efficiency, and potentially achieve net negative emissions with natural or engineered sequestration. The CarbonTech Development was previously filed under the “CleanTech Startup Growth” initiative. It has been added to this focus area as it is partially funded by and serving Negative Emissions Technology. The Natural Carbon Solutions initiative was initially developed by NYSERDA in 2021 and formally introduced for approval in 2022 with a budget of \$12.5 million. Once approved, this initiative will support demonstrations that have the potential to lead to larger scale-up and follow-on investment in New York State, while de-risking novel approaches and leveraging federal and other funding sources in the process. This initiative leverages solutions from agriculture, forestry, and waste sectors for low-carbon building products, low carbon fuels for heating and distributed power generation. The CEF funding here will also leverage companion Regional Greenhouse Gas Initiative (RGGI) funds.

3.5.9 Renewable / Distributed Energy Resources

The significant increase in renewable deployment necessary to achieve the CES goals requires a focused effort to reduce all system cost components. As capital costs continue to decline for many clean energy technologies, further cost efficiencies must be achieved by reducing non-equipment costs, referred to as soft costs, or balance-of-system (BOS) costs. These include inefficient and inconsistent local regulations; one-time costs such as land siting, interconnection, and environmental studies; and ongoing costs such as customer acquisition and management. The Reducing Barriers to Distributed Deployment initiative’s

budget and scope have been modified to free up funding for other strategic energy storage priority work currently under development. However, this initiative will continue funding cost-shared studies. The Fuel Cells initiative's budget has also been reduced as some project attrition is expected as this initiative winds down.

3.5.10 Renewables Optimization

The initiatives in this focus area will improve the economics for renewable and distributed energy resources by addressing technical barriers, as well as advancing renewable technologies that have potential to drive large-scale greenhouse gas reductions, improve grid resiliency, and contribute to New York State's renewable generation and decarbonization objectives. The Energy Storage Technology and Product Development initiative is redeploying existing funding and adding \$6.5 million in funding to focus on long duration storage efforts going forward.

3.5.11 Technology to Market

NYSERDA seeks to support a vibrant climate technology innovation ecosystem that will enable the maturation and scale of new startup ventures and innovative solutions designed for decarbonization outcomes that can directly benefit New York State. NYSERDA also seeks to inform regulation and policy with the latest breakthrough and achievements in climate innovations. The activities in this NYSERDA focus area will benefit many ecosystem actors with emphasis on early-to-mid stage companies, investors, manufacturers, entrepreneurs, solution adopters, and policy makers and regulators. We seek to impact these groups through our activities that advance the maturity of climate technologies in alignment with NYSERDA's ambitious climate goals. The initiative previously filed as "CleanTech Startup Growth" has been split into four smaller initiatives to improve clarity for stakeholders. Some of this work now also supports the Buildings Innovation and Negative Emissions Technology focus areas. The nature of the work being executed in these four newly stated initiatives is consistent with what was previously approved. The initiatives are now called: Climatetech Commercialization Support, Catalytic Capital for Climatetech, Climatetech Expertise and Talent, and Carbontech Development. Climatetech Commercialization Support is adding \$10 million to expand Incubator efforts, and Climatetech Expertise and Talent is adding \$4.6 million to support continued Entrepreneur-in-Residence efforts. Furthermore, the Manufacturing Corps initiative is adding \$5 million in funding to expand upon the successful engagements thus far.

3.5.12 Transportation

The Transportation Market Development focus area seeks to support further market adoption of new technologies and strategies to reduce greenhouse gas emissions from the transportation sector and to gain market traction for these products. Activities are designed to resolve market barriers holding back the adoption of clean transportation technologies and strategies and provide financial support for the adoption of these clean transportation activities. The EV Charging & Engagement initiative was introduced in 2022 for \$7.2M to launch a Level 2 EV charging station rebate program targeting workplace, multi-unit dwellings, and public disadvantaged community charging stations – locations where Level 2 EV charging stations are most likely to lead to more EV adoption and where they are in lowest supply.

4 Program Accomplishments

NYSERDA's activities are focused on achieving the five strategic goals/outcomes titled, Efficient Use of Energy, Renewable and Diverse Energy Supplies, Clean Energy Economy, A Cleaner Environment, and Contract and Cycle Time/Accessibility, as shown in Table 1. NYSERDA's 2021 accomplishments are organized and reported in alignment with these five strategic outcomes. The accomplishments are stated in a cross-program manner, and notably, include results spanning pre-CEF and CEF initiatives.

Table 1. Mission, Vision, Outcomes

Mission	Advance innovative energy solutions in ways that improve the State's economy and environment.				
Vision	Advance clean energy innovation and investments to combat climate change, improving the health, resiliency, and prosperity of New Yorkers, and delivering benefits equitably to all.				
Stakeholders	New York State energy users, businesses, and institutions engaged in the clean energy economy.				
Core Value	NYSERDA will serve as a source of objective, credible information.				
Strategic Goals/Outcomes	Efficient Use of Energy NYSERDA reduces market barriers and spurs demand for energy solutions that reduce the energy consumption and increase the energy efficiency of New York State's residents and businesses.	Renewable and Diverse Energy Supplies NYSERDA diversifies New York State's portfolio of energy resources by accelerating development of renewable and distributed generation resources.	Clean Energy Economy NYSERDA catalyzes technology innovation, new business opportunities, and private investment in clean energy in New York State.	A Cleaner Environment NYSERDA enables markets for new clean energy products and services that can produce meaningful reductions in the environmental impact of energy production and use.	Contract and Cycle Time, Accessibility NYSERDA is responsive to customer needs by delivering accurate and timely information, services, and programs.

Tables 2 through 7 provide performance information for each of the five outcomes, including data that describes NYSERDA's annual incremental commitment performance for calendar year 2021, cumulative commitments through December 2021, and the total cumulative acquired progress achieved through December 2021.

Targets for calendar year 2022 are also provided for performance measures, when possible. NYSERDA's targets are expressed on an acquired basis (i.e., having to do with when funds are expended, and projects completed). Acquired targets place a greater emphasis on putting money to work in the market and completing projects in a timely manner.

Each metrics table contains two columns on the left side representing a commitment-based view and four columns on the right side representing the acquired-based view.

- The column **Cumulative Committed Benefits at End of 2020** represents NYSERDA's total benefits expected from projects committed through 2020, representing the prior year pipeline.
- The column **Cumulative Committed Benefits at End of 2021** represents NYSERDA's total benefits expected from projects committed through 2021, representing the current pipeline.
- The column **Acquired Target CY 2021 Addition** represents NYSERDA's expected target for new acquired benefits achieved during the calendar year.
- The column **Acquired Achieved CY 2021 Addition** represents NYSERDA's actual progress for new acquired benefits achieved during the calendar year.
- The column **Acquired Total Cumulative at end of 2021** represents the total benefits NYSERDA achieved from projects that have been completed through 2021.
- The column **Acquired Target CY 2022 Addition** represents NYSERDA's expected target for new acquired benefits achieved during the calendar year.

The quantitative performance measurement data are supplemented with contextual information, as needed and when available, and highlights of additional 2021 accomplishments.

While the listed targets and performance measures are used to evaluate NYSERDA's progress toward goals, many of 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 measures are intended to serve as good indicators of progress in the context of these external factors.

As the New York State and the entire nation continued to feel the lasting impact from the pandemic and related economic effects during 2021, manufacturing, shipping and workforce capacity issues have all led to increased construction costs and timelines. Supply chain disruptions have resulted in restricted supply and thus increase costs for equipment and consumer goods while contractors are experiencing challenges finding qualified labor, leading to cost increases on construction projects. Additionally, project timelines are also increasing due to these issues. While NYSERDA programs have not been immune to these near-term economy-wide disruptions, clean energy projects are still proceeding toward the State's long-term goals.

Table 2 presents NYSERDA's progress toward the efficient use of energy performance measures.

During 2021, performance against energy efficiency delivery targets shown in Table 2 exceeded the target for fossil fuel saved but fell short for electricity and therefore energy bill savings. The majority of the electricity savings shortfall can be attributed to three CEF transition programs, which have now committed all their funding and closed, but that experienced significant project completion delays due to supply chain disruptions and contractor labor shortages. These projects are expected to be completed in 2022 and are reflected in the 2022 targets, however a degree of uncertainty remains in terms of the future economic environment and supply chain constraints. NYSERDA is committed to driving progress towards NYS's clean energy goals and will continue to monitor the State's economic recovery and make programmatic adjustments as needed.

2021 targets included only the direct energy-efficiency impacts acquired in the calendar year in order to most accurately reflect the effectiveness of NYSERDA operations to support projects and provide immediate benefits to participants. 2022 targets are set on the same basis. Reporting of total cumulative acquired benefits also include indirect energy-efficiency impacts brought about by market transformation as they are quantified.

Table 2. Performance Measures—Efficient Use of Energy

Performance Measures	Commitment Pipeline		Acquired Benefits			
	Total (Cumulative) End of CY 2020	Total (Cumulative) End of CY 2021	Target CY 2021 Addition	Achieved CY 2021 Addition	Total (Cumulative) End of CY 2021	Target CY 2022 Addition
Electricity^{a,b} (GWh) saved annually due to improved energy efficiency in New York State's buildings and facilities.	1,860	1,671	501 ^c	383	8,883 ^d	578
Fossil Fuels^{a,b} (MMBtu) saved (in millions) annually due to improved energy efficiency in New York State's buildings and facilities.	7.1	6.2	2.2 ^c	2.3	26.2 ^d	3.6
Energy Bill Savings Annual direct energy bill savings realized by participating customers (all programs).	\$313	\$261	\$95	\$81	\$1,684 ^b	\$65 ^e

^a The system benefit charge (SBC) was authorized in 1998 and NYSERDA began programs the following year. Substantial installations had taken place beginning in 2001 and based on an average 16-year measure life, NYSERDA's 518 GWh and 1.2 million MMBtu installations will be "retired" in 2021. These amounts and the associated emission reduction and customer bill savings have been netted out of the Total Cumulative End of CY 2021 values reported.

^b All energy savings values are gross, i.e. not reflecting adjustments made through evaluation, measurement and verification.

^c Targets have been adjusted to include only anticipated direct energy-efficiency impacts acquired in the calendar year. Reporting of total cumulative acquired benefits includes indirect energy-efficiency impacts brought about by market transformation as they are quantified.

^d Approximately 587 GWh and 700,000 MMBtus in indirect impacts quantified through evaluation studies in 2021 have been included in the Total Cumulative End of CY 2021 totals.

^e Department of Public Service implemented new bill savings factors for CEF reporting effective 1/1/2022

Table 2a. Comparison Points—Efficient Use of Energy

Comparison Points	
Electricity (GWh)	2020 statewide annual sales of electricity—140,407 GWh ^a
Fossil Fuels (MMBtu)	2019 statewide annual (residential, commercial, industrial) natural gas and petroleum usage—1,213 million MMBtu ^a
Number of New York State households served	2020 occupied housing units in NYS—7,417,224 ^b
Number of commercial and industrial customers served	2020 business establishments in NYS—537,369 ^c

^a NYSERDA, Patterns and Trends, Energy Information Administration (EIA), 2022

^b American Community Survey

^c U.S. Census Bureau: State and County Quickfacts

Additional highlights for Efficient Use of Energy:

- Since 1998, NYSERDA-administered energy efficiency programs have saved enough electricity to power more than 1.61 million homes each year and enough natural gas, propane, oil, and other heating fuels to heat 381,000 homes each year.
- More than 985,000 households and 46,600 commercial, industrial, and institutional customers reduced their energy use and annual energy bills by participating in NYSERDA programs since 1998.

The contribution from renewable energy resources to meet New York State’s electric load rose to 27.4 percent in 2020 from the adjusted 2014 baseline of 25.3 percent, an overall increase of 1.7 percent.

Table 3 presents NYSERDA’s progress toward the renewable and diverse energy performance measures. Under the CES, NYSERDA was ordered to conduct regularly scheduled solicitations for the long-term procurement of qualifying renewable energy certificates (REC) to achieve anticipated and minimum results for the years 2017–2021. In January of 2020, the Public Service Commission (PSC) amended the form of NYSERDA’s Renewable Energy Standard (RES) procurements by formally adopting the Index REC price structure to NYSERDA’s land-based, large-scale renewable procurements, which was offered for the first time under its 2020 request for proposal. The 2020 RES solicitation was the first to utilize an innovative contract structure whereby awarded contracts receive a floating payment for their renewable energy certificates. This payment moves inversely to an index comprised of market energy and capacity prices. This method is supported by the project development and finance community and provides greater revenue certainty while reducing cost impacts to ratepayers.

The fifth RES solicitation was issued in April 2021 and was the first to seek an expanded target of 4.5 million RECs per year to support the Tier 1 procurement trajectory identified in the CES White Paper and achieve the Climate Act target of 70% renewable energy by 2030. The results of the fifth RES solicitation are expected to be announced in second quarter of 2022. 2021 actual renewable energy production delivered to the wholesale market fell somewhat short of target (92 percent) due to renewable energy credit reforecasting of expected generation for the one facility that became operational in 2021.

Also shown in Table 3, renewable energy production from on-site installations and solar PV capacity exceeded the targets due NY-Sun commitments in 2021 that were significantly greater than expected, resulting in greater project completions than expected. The NY-Sun commitments were driven primarily by the State's expanding community solar market. In 2021, NYS completed the most community solar projects in the country. In December 2021, NYSERDA and DPS jointly filed the Distributed Solar Roadmap, proposing a pathway toward an expanded statewide target of 10GW of distributed solar by 2030.

Table 3. Performance Measures—Renewable and Diverse Energy

Performance Measures	Commitment Pipeline		Acquired Benefits			
	Total (Cumulative) End of CY 2020	Total (Cumulative) End of CY 2021	Target CY 2021 Addition	Achieved CY 2021 Addition	Total (Cumulative) End of CY 2021	Target CY 2022 Addition
Renewable resources electricity produced						
1) Annual Electricity Production (GWh) delivered to wholesale power market from incentivized installations ^{a,b}	30,530	47,743	250	229	2,320	228
2) Annual Electricity Production (GWh) from on-site installations	2,631	3,291	606 ^c	663	3,401	821
Solar PV capacity (GW) from all NYSERDA funded solar PV programs, including NY-Sun 6 GW goal^b	2.1	2.5	0.5	0.56	2.7	0.7

^a Amount is net of any NYSERDA-contracted facilities which have reached their terminus year, after which NYSERDA no longer has the rights to claim the attributes of their generation.

^b NYSERDA does not, by filing this report, make any claim to the environmental attributes associated with the megawatt-hours. NYSERDA has relinquished all such rights and disavows any and all rights to any environmental claims or renewable energy to which it had made claims under previous policies.

^c Target has been adjusted to account for program benefits that overlap with each other to avoid double counting.

Table 3a: Comparison Points—Renewable and Diverse Energy

Comparison Points	
New York Load Served by Renewables ^a	2020 Renewable Energy Serving Load—27.4% (40,572 GWh)

^a CES Annual Progress Report—2020 <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FAA057E2-4684-440A-BF60-AED5E49D5640}>

Additional highlights for strategic goal/outcome Renewable and Diverse Energy supplies:

- NYSERDA is currently supporting 148 large-scale renewable generation projects representing 9,072 MW of renewable generation capacity. There are 41 facilities operating with the remainder of the projects under design and construction.
- NYSERDA is currently supporting four offshore wind generating projects, which are both under design and construction, and once operating will represent 4,230 MW of renewable capacity.
- NYSERDA is also supporting two Tier 4 projects aimed to increase the penetration of renewable energy in New York City and leverage the State’s existing robust contracted and awarded pipeline of large-scale renewable energy, comprised of nearly 100 solar, land-based and offshore wind projects totaling 12,300 MW of clean power—enough to power over six million New York State homes when completed.
- NYSERDA’s Retail Energy Storage Incentive program, launched in 2019, achieved several important milestones during the 2021 reporting period. Nine retail projects were completed in 2021, with a combined rating of 22.7MW and a capacity of 67.4MWh. The Long Island Commercial Storage Block became fully allocated in October 2021, with awards issued to seven projects, with a combined rating of 9.1MW and a capacity of 47.3MWh. A fourth block of New York City incentives was launched and quickly allocated in July 2021, supporting 18 additional projects with a combined rating of 78.0MW and a capacity of 277.4MWh.

Table 4 presents NYSERDA’s progress toward the clean energy economy performance measures. The 2021 target for leveraged funding was exceeded, primarily due to overachievement of the above target for on-site production, specifically through the significant investment in solar PV capacity.

Table 4. Performance Measures—Clean Energy Economy

Performance Measures	Commitment Pipeline		Acquired Benefits			
	Total (Cumulative) End of CY 2020	Total (Cumulative) End of CY 2021	Target CY 2021 Addition	Achieved CY 2021 Addition	Total (Cumulative) End of CY 2021	Target CY 2022 Addition
Total funding leveraged from all NYSERDA investments (\$billions) ^{a,b}	\$31.5	\$32.3	\$1.7	\$1.7	\$19.6	\$2.3

^a NYSERDA's data set for leveraged funds began in 2010.

^b Data collection for leveraged funds associated with NYSERDA's Technology and Business Development programs is an ongoing effort and the reported values included in this figure represent incomplete data that will be supplemented in future years.

Additional highlights for Clean Energy Economy:

- As a component of the leveraged funding presented in Table 4, NYSERDA's investment in technology and business development has leveraged \$1.2 billion in 2021 for a total of \$2.4 billion through the end of calendar year 2021.
- As a result of NYSERDA's technology and business development investments:
 - There are more than 656 new and improved clean energy products in the market (including 93 new products added in 2021) in all end-use energy sectors from high efficiency furnaces to advanced lighting controls and hybrid electric buses.
 - There are 90 new clean energy products currently in development with support from NYSERDA.
 - Annual sales of products developed with NYSERDA support have reached approximately \$2,523 million⁵.
 - There are currently 95 clean energy businesses receiving financial support.
- NYSERDA's incubator program, which supports six cleantech incubators across the State, assisted 374 clients and helped these startups raise more than \$1.85 billion in private and non-NYSERDA public investment, while generating and retaining 2,196 jobs and bringing dozens of new clean energy and clean technology products to the market.

Table 5 presents NYSERDA's progress toward cleaner environment performance measures. The 2021 achieved carbon reductions fell slightly short of target (95 percent) mainly due to the shortfall in acquired electricity savings benefits described earlier.

Table 5. Performance Measures—A Cleaner Environment

	Commitment Pipeline	Acquired Benefits
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⁵ Total annual sales decreased to correct sales information reported to NYSERDA in prior periods.

Performance Measures	Total (Cumulative) End of CY 2020	Total (Cumulative) End of CY 2021	Target CY 2021 Addition	Achieved CY 2021 Addition	Total (Cumulative) End of CY 2021	Target CY 2022 Addition
CO ₂ equivalent emission reductions (in millions) due to NYSERDA's energy efficiency, renewable, and diverse energy programs (annual metric tons) (All programs)	17.65	19.95	0.75 ^a	0.71	9.54	1.07

^a Targets have been adjusted to include only anticipated direct energy-efficiency impacts acquired in the calendar year. Reporting of total cumulative acquired benefits includes indirect energy-efficiency impacts brought about by market transformation as they are quantified and to account for program benefits that overlap with each other to avoid double counting.

Table 5a. Comparison Points—A Cleaner Environment

Comparison Points	
CO ₂ emission reductions ^a	2019 annual NYS power sector emissions—21 million metric tons CO ₂

^a (1) U.S. Energy Information Administration. "Table 3. 2019 State energy-related carbon dioxide emissions by sector." <https://www.eia.gov/environment/emissions/state/>. Includes emissions from in-state power generation only. GHG emissions associated with imported power as well as the upstream impacts of fossil fuel extraction, processing, and transportation are being assessed in collaboration with DEC as part of a separate GHG emissions reporting process established by the Climate Act.

Energy-related environmental policies in 2021 informed by NYSERDA reports/studies:

- In response to stakeholder concerns, the Environmental Research Program initiated an effort to understand and balance agricultural lands and practices with advancing renewable energy development. This included supporting a series of research projects to understand the implications of solar development on agricultural lands and practices and the formation of an Agricultural Technical Working Group to inform additional actions. These actions include the development of a smart solar siting scorecard that prioritizes avoiding valuable agricultural land and minimizing impacts through the implementation of design and management strategies that are most protective of these resources.
- The Environmental Research Program continued to support projects focused on monitoring methane and other greenhouse gases from compressor stations, landfills, and other sources. These build on the existing network of long-term monitors that will assist in developing and refining NYS's inventory in support of New York's Methane Reduction Plan.

- An Integrated-Duty Cycle (IDC) test protocol for cordwood stoves was approved by US EPA as a Broadly Applicable Alternative Test Method for certifying stoves in 2020. The IDC protocol was developed with support from the Environmental Research Program and evaluates efficiency and emissions performance under more realistic in-use conditions than EPA's current test protocol. NYSERDA continues to support EPA in their acceptance testing of the IDC methods for residential wood heaters.
- The Environmental Research Program supported the development of the Zip Code-Level Air Pollution Policy Assessment (ZAPPA) tool to model the air pollution concentration at neighborhood scales in NYC and estimate and monetize the resultant health effects.
- The Environmental Research Program worked with the Fisheries Technical Working Group to develop a draft fisheries compensation overview document to advance a fair and equitable fishing compensation plan for impacts that cannot be avoided, minimized, or reasonably mitigated.
- The Environmental Research Program initiated projects focused on monitoring marine mammal presence and environmental conditions in the New York Bight Offshore Wind Energy Lease Areas. Biological and environmental concerns will be addressed by these surveys, further supporting the responsible development of offshore wind.

Tables 6 and 7 present NYSERDA's progress toward the contract and cycle-time performance measures, which NYSERDA assesses in terms of invoice payment and contract processing timelines. NYSERDA maintained its long-standing record of strong performance regarding prompt payment of invoices. Contract cycle time also shows strong performance, consistent with prior years and meeting all targets set for 2021. Contract cycle time has seen a reduction over the years in cycle times across most solicitation types. This can be attributed to the many improvements made and continuous monitoring of solicitation and contract status on a monthly basis, which help NYSERDA ensure efficiency while appropriately managing risk.

Table 6. Performance Measures—Contract and Cycle Time (Invoicing)

CYCLE TIME—INVOICING <i>NYSERDA is responsive to customer needs—delivering accurate and timely information, services, and programs.</i>					
Performance Measures	CY 2019	CY 2020	TARGET CY 2021	CY 2021	TARGET CY 2022
Invoice payment:					
1) Number of invoices paid within 30 days	79,756 invoices	71,440 invoices	***a	93,599 invoices	***a
2) Percent of payments made within 30 days	99.99%	99.99%	100%	99.99%	100%

^a The measure will be monitored and reported but a target has not been set. NYSERDA 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. Performance Measures—Contract and Cycle Time (Solicitations)

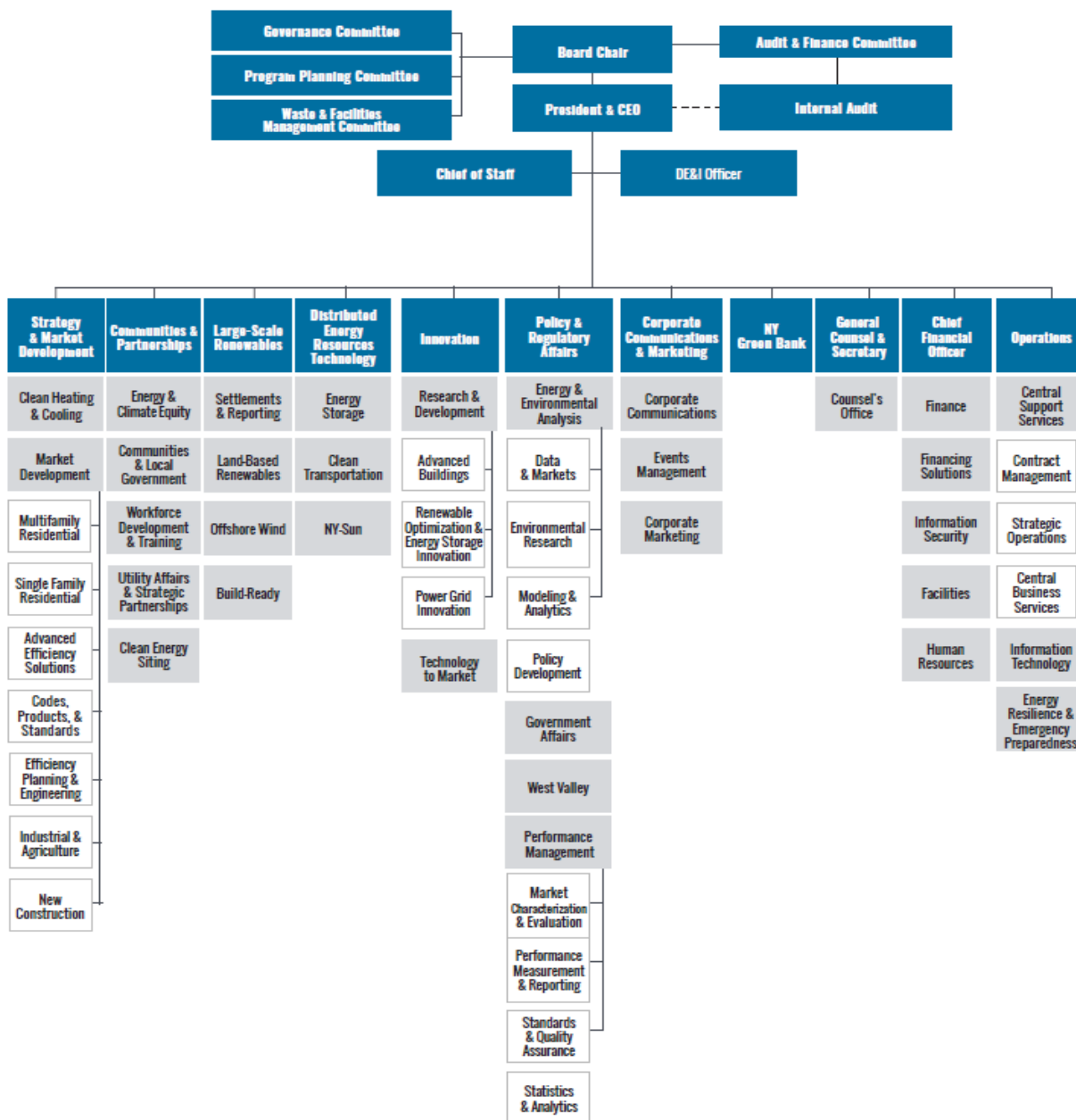
CYCLE TIME—CONTRACTS <i>NYSERDA is responsive to customer needs—delivering accurate and timely information, services, and programs.</i>				
Performance Measures	CY 2020 Median Total No. of Weeks	Target CY 2021	CY 2021 Median Total No. of Weeks	Target CY 2022
Contract Processing Time—Median time to Process (Weeks):				
1) Due Date Solicitations	29	30	30	30
2) Open Enrollment and Task-Work Orders	2.29	2	1.57	2
3) Open Enrollment (Automated) ^a	0.43	1	0.14	1
4) All Other Actions (Direct Contracts and Contract Modifications)	1.29	2	1.21	2

^a The contracting process for Residential NY-Sun projects has been automated, leading to reduced cycle times. As these processes are fundamentally different than other open enrollment solicitations, we have broken them out into their own category.

5 Program Units

This section includes NYSERDA's program units, as represented on the organization chart below. Each unit includes a brief overview. The organization units not described in this section but included on the organization chart are operational and administrative rather than program units.

Figure 1. NYSERDA Organizational Structure



5.1 Communities and Local Government

The Communities and Local Government unit provides a unified approach toward local energy action to better serve local communities' needs and to advance clean energy policies and practices statewide. The program is intended to implement a common framework that enables communities to embed clean energy into their planning, help facilitate and prioritize implementation, and recognize/showcase community energy and sustainability actions.

5.2 Multifamily Residential

The Multifamily Residential unit 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 for 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 by increasing their technical skill sets and tools; demonstrate viability of deep energy retrofits in multifamily affordable housing stock; and further the emergence of performance contracting.

5.3 Single-Family Residential

The Single-Family Residential unit 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 one to four dwelling units) and facilitates the growth of demand for energy services.

5.4 Workforce Development and Training

The Workforce Development and Training unit enables workforce development and training where the lack of a trained workforce inhibits growth in 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; and enables growth of jobs in disadvantaged communities.

5.5 Advanced Efficiency Solutions

The Advanced Efficiency Solutions team is a cross-sectoral group whose primary goal is to accelerate the adoption of energy efficiency and electrification in buildings by increasing private sector investment in building decarbonization technologies and services. Initiatives run by the Advanced Efficiency Solutions team advance commercially available energy efficiency, electrification, and load flexibility solutions that deliver carbon reductions. This team is focused on engagement with large building portfolio owners and leveraging solutions within and across their portfolios.

5.6 Codes, Products, and Standards

The Codes, Products, and Standards team promotes energy efficiency across sectors through regulatory and supply chain interventions. The team supports building energy code advancement, education, and compliance, working with actors across the construction market, including building owners, developers, and elected officials, with a goal of promoting zero carbon or even net-carbon positive building performance. The team also drives the promotion of improved product and appliance standards, along with the adoption and expansion of building energy and water benchmarking. The team continues to find ways to improve the efficiency and success of program delivery models, including the promotion of a statewide supply chain.

5.7 Efficiency Planning and Engineering

The Efficiency Planning and Engineering Team is an inter-disciplinary group with the primary goal of increasing clean energy investment in commercial buildings. To accomplish this objective the Team engages with commercial stakeholders, sector organizations, service providers and customers to deliver monetary and informational incentives. This team manages the multi-sector Technical Services platform and its qualified engineering vendor community. Sector specific initiatives such as REV Campus Challenge, and the P-12 Initiative are examples of segment targeted efforts under this team.

5.8 Industrial and Agriculture

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

5.9 New Construction

The New Construction unit works across all sectors, including low- to moderate-income (LMI) households, 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 projects. This includes strategies to improve contracting, design and construction practices, and promote zero- and positive-net carbon construction and renovation practices that maximize cost-effective carbon reductions.

5.10 Clean Heating and Cooling

The Clean Heating and Cooling unit will seek to enable a self-sustaining market for clean heating and cooling solutions, helping to increase the viability of net zero energy buildings in the State. The team is focusing on shifting from a building-by-building to a block-by-block and community approach towards decarbonization and heating electrification. The team will continue to promote district energy systems, which utilize various heating and cooling media in shared infrastructure loops, as a cost-effective and scalable business model on a statewide scale. Clean heating and Cooling will also address barriers to market growth, including low-customer awareness and confidence, limited trained service providers, high-upfront costs, significant soft costs, variable performance data, and lack of affordable financing solutions.

5.11 Energy and Climate Equity

The Energy Affordability and Equity unit develops strategies and proposes policy, coordinating across all sectors and various State organizations to streamline and improve the effectiveness of energy services delivery to low- to moderate-income households. The unit also manages single-family residential energy efficiency incentive programs.

5.12 Utility Affairs and Strategic Partnerships

The Utility Affairs and Strategic Partnerships unit manages the Authority's utility engagement strategy under REV, oversees the funding agreement with the Long Island Power Authority, and leads the development of a \$50 million energy efficiency Pay-for-Performance partnership program with National Grid and Con Edison.

5.13 Large-Scale Renewables

The Large-Scale Renewables unit will sustain and expand the penetration of large-scale renewables in the State and support the development of the next frontier of renewable resources, including offshore wind. The program will document New York State's progress toward its renewable goals and facilitate New York State's renewable voluntary market through the management of the New York Generation Attribute Tracking System. The program will also provide stakeholder outreach, technical, and pre-development assistance to increase acceptance and reduce soft costs associated with the development of these assets as well as assess alternate energy market valuation and transmission solutions for renewables. The team will also manage over \$1 billion in existing Renewable Portfolio Standard Main Tier contracts, actively execute its Renewable Energy Standard procurement and contracting role, including management of the nearly \$4 billion in agreements awarded over the past three years, and execute on its offshore wind procurement responsibilities as assigned by the New York State Public Service Commission.

The Offshore Wind unit will support the Large-Scale Renewables program through the expansion of offshore wind technology in the State. The unit will document New York State's progress toward its offshore wind development goals and provide stakeholder outreach and technical and pre-development assistance to increase acceptance and reduce soft costs associated with the development of these assets. Additionally, the team will actively execute regular generation project procurements for the State as authorized by the New York State Public Service Commission to acquire offshore wind renewable energy credits (ORECs).

5.14 Clean Transportation

The Clean Transportation unit will develop and implement programs to expand the adoption of clean transportation options in New York State and support the development and demonstration of new clean transportation technologies. The unit will craft innovative approaches to expedite market adoption of electric vehicles and clean mobility options, removing barriers to increased clean transportation use such as cost, awareness, ease of access, and availability of financing. Additionally, the unit will work with public and private partners to develop and demonstrate novel technologies and business models that address key barriers to clean transportation market expansion in NYS.

5.15 Energy Storage

The Energy Storage unit 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 GHG 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 as well as other NYSERDA teams.

5.16 NY-Sun

The NY-Sun unit has 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 New Yorkers while scaling up the State’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.

5.17 Research and Development

The Technology and Business Innovation unit facilitates the research, development, and commercialization of new and innovative clean energy technologies that when deployed at scale will deliver meaningful reductions in GHG emissions. Technology and Business Innovation employs a comprehensive strategy that integrates and leverages direct investment in startup and established clean energy companies, establishes sustainable multiuse 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 multiuse 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 the following areas:

- Smart Grid Systems and Distributed Energy Integration: Accelerate the evolution to a smarter more integrated grid that allows for 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.
- 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 and make NYS the place for innovation.

5.18 Tech to Market

The Tech to Market team is focused on commercializing the climatetech solutions NYSERDA needs to reach its nation-leading climate goals through the deployment of startup support programs and direct funding opportunities for climatetech companies. Key approaches from this team include: offering expert support for business scale up, manufacturing, and demonstration, providing training in business building concepts and best practices, offering direct catalytic funding to accelerate company growth and impact, connecting innovators to local resources, investors, and customers in New York, and stimulating novel business models to move key markets that can increase climatetech solution adoption.

5.19 Energy and Environmental Analysis

The Energy and Environmental Analysis unit assists 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 as well as development of new technologies.
- Assessing the impact of energy and environmental policies, programs, and technologies on the State's residents, 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.

5.20 Clean Energy Siting

The Clean Energy Siting unit offers several resources to help local governments understand how to manage responsible clean energy development in their communities. These resources include step-by-step instructions, tools, guidebooks, and educational workshops to guide the implementation of clean energy, including permitting processes, property taxes, siting, zoning, and more. The team also provides one-on-one technical assistance to local governments and maintains relationships with other stakeholders to ensure resources are up to date and providing meaningful, timely, relevant information.

5.21 Build-Ready

The Build-Ready Program partners with local communities across New York State to identify and advance renewable energy projects on previously developed and underutilized land, including brownfields, landfills, dormant electric generating sites, and abandoned or existing commercial and industrial sites. NYSERDA takes these difficult sites and makes them “build-ready” for private renewable energy developers to ultimately construct and operate, complementing rather than displacing the work of commercial developers. Specifically, Build-Ready advances pre-construction development activities for each site including site control, preliminary design, permitting, interconnection, and community

benefits through Payment-in-Lieu-of-Taxes Agreements and Host Community Agreements. Sites are ultimately competitively auctioned and transferred to private developers, along with a Renewable Energy Certificate (REC) Agreement, for final design, construction, operation, maintenance, and eventually decommissioning. The Build-Ready Program is currently advancing a pipeline of sites across New York State having screened over 5,000 sites and progressing about 30 sites through more advanced assessment and development.

5.22 Financing Solutions

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

NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

To learn more about NYSERDA's programs and funding opportunities, visit nyserda.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.

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