

New York State Energy Research and Development Authority
Operations, Accomplishments, Mission Statement,
and Performance Measurement
Annual Report

Fiscal Year Ended March 31, 2020

Pursuant to Public Authorities Law Section 2800(1)

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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 Governor Andrew M. Cuomo 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 and Vision

NYSERDA's **mission** is to advance innovative energy solutions in ways that improve New York State's economy and environment.

NYSERDA's **vision** is to serve as a catalyst for 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 seeks to support the widespread development and use of innovative technologies to improve the State's energy, economy, and environment. 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.

3 Operational Changes and New Initiatives

This section begins with information on major clean energy policies that were enacted in 2019 and represent key drivers and context for NYSERDA's programs. This section continues to include a description of each of NYSERDA's new initiatives. Several of the new initiatives this year modify and build upon prior offerings by NYSERDA and are mainly driven by the continued rollout of the Clean Energy Fund (CEF).

3.1 Green New Deal and Climate Leadership and Community Protection Act (CLCPA)

Governor Cuomo announced New York's Green New Deal on January 15, 2019, which is the most aggressive climate change program in the nation and puts the State on a path to complete carbon-neutrality across all sectors of the economy, including power generation, transportation, buildings, industry, and agriculture. The Climate Leadership and Community Protection Act (CLCPA), signed in July 2019, has adopted the primary clean energy goals of the Green New Deal and has set the State target to reduce greenhouse gas (GHG) emissions from all anthropogenic sources 85% below 1990 levels by the year 2050, including an interim target of a zero-carbon emissions electricity sector by the year 2040. The CLCPA mandates the following:

- Six thousand megawatts (MW) of solar by 2025
- Seventy percent renewable electricity by 2030
- Nine thousand MW of offshore wind by 2035
- Carbon-free electricity by 2040
- Three thousand MW of Energy Storage by 2030
- Disadvantaged communities shall receive no less than thirty-five percent of the overall benefits of spending on clean energy and energy efficiency programs, projects or investments

With these goals, New York State is undertaking one of the most aggressive clean energy agendas in the nation. Through the CEF and its other portfolios, NYSERDA works to foster the transformation of markets, pushing them to accurately value clean energy, energy efficiency, and resilience while encouraging competition and innovation that delivers value to consumers so that New York can achieve its aggressive clean energy goals.

3.2 Offshore Wind

In his 2019 State of the State address, Governor Cuomo proposed a significant ramp-up of the State's renewable energy goal to 70% of electricity met by renewables by 2030, alongside other renewable energy goals of increasing New York's offshore wind target to 9,000 megawatts by 2035. On November 8, 2018 NYSERDA issued its inaugural solicitation for offshore wind energy pursuant to the New York State Public Service Commission's Order Adopting the Offshore Wind Standard which provides a framework for an initial phase of offshore wind energy solicitations. The solicitation sought to stimulate the development of the domestic offshore wind industry, reduce the cost of later offshore wind procurements, and allow New York State to realize the direct benefits associated with the construction, operation, and maintenance of offshore wind resources. In October 2019, NYSERDA finalized contracts for its first two offshore wind projects, Empire Wind (816 MW, Equinor US Holdings, Inc.) and Sunrise Wind (880 MW, Sunrise Wind LLC, a joint venture of Ørsted A/S and Eversource Energy) as the largest procurement for offshore wind in the nation.

In January 2020, NYSERDA sought authorization from the Public Service Commission to effectuate its second offshore wind procurement ranging from at least 1,000 MW and up to 2,500 MW in the 2020 solicitation. On April 23, 2020, the Public Service Commission released its second Order related to offshore wind.

The April 2020 Order calls for NYSERDA to issue its second offshore wind solicitation in 2020 and allows NYSERDA flexibility to award up to 2,500 MW. In its evaluation process, NYSERDA will 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.

3.3 Clean Energy Fund

During 2019, NYSERDA accomplished several key milestones related to the CEF, including developing and receiving approval to launch many key initiatives. This section describes the establishment of the CEF portfolio, which began with the first initiatives introduced in 2016 and continued to build in 2019.

In June 2015, NYSERDA filed the Clean Energy Fund Information Supplement, paving the way for the 10-year, \$5 billion CEF. Through the CEF, NYSERDA seeks to build on its success and momentum to meet evolving market and customer needs. NYSERDA 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 State; and significant reductions

in greenhouse gas (GHG) emissions from the State's energy sector. This investment will span across four program portfolios: Market Development, Innovation and Research, NY Green Bank, 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 (CES), and initiatives advanced by the New York Power Authority.

The CEF employs innovative solutions that remove barriers, solve targeted customer needs, and provides value to all clean energy stakeholders. The CEF represents a shift in strategies toward engaging market forces and leveraging capital through investments that lower costs and make clean energy more affordable and accessible. Through the CEF, NYSERDA will continue to act as a catalyst for advancing energy innovation and technology, transforming New York State'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 engage. NYSERDA also orients more towards a strategic, market-based approach to identify and size market opportunities as well as to uncover and address customer value propositions in a meaningful way.

The following sections provide a description of new CEF initiatives approved in the reporting year, although some but not all have been launched in this period.

3.3.1 Low- to Moderate-Income

Under the CEF, NYSERDA administers twelve market development interventions with a comprehensive, three-pronged strategy for improving energy affordability and access to clean energy solutions for low- to moderate-income (LMI) communities, customers, and building owners. Eleven initiatives have been previously approved: RetrofitNY, REVitalize, Low-Income Forum on Energy, Healthy Homes Feasibility Study, Single Family Residential Low Income, Single Family Residential Moderate Income, Low-to-Moderate Income Multifamily, Low-to-Moderate Income Multifamily New Construction, Low-to-Moderate New Construction, Low-to-Moderate Income Low Rise New Construction and Low-to-Moderate Income Community Solar. Approved in 2020, the New York State Healthy Homes Value-Based Payment Pilot, funded at \$9.8 million, will seek to develop a replicable model for implementing a healthy homes approach to residential building improvements under the Medicaid Value-Based Payment (VBP) framework. By validating impacts such as healthcare cost savings and benefits to residents, as well as providing market development support, including specification of

services and VBP contracting, the Pilot will facilitate the adoption of healthy homes treatments by Medicaid managed care organizations (MCO) as part of their Medicaid VBP Arrangements that incorporate social determinants of health.

3.3.2 Multisector Solutions

NYSERDA administers six initiatives aimed at broadly supporting the development and deployment of clean and renewable sources of energy, a more efficient and responsive grid, and more energy-efficient buildings across more than one targeted market segment. These multisector solutions will address cross-cutting barriers and opportunities applicable to multiple sectors, including reducing soft costs, providing technical assistance, and increasing confidence in clean energy solutions. Five active initiatives, Aggregated Technical Services, Commercial and Industrial Carbon Challenge, and Clean Energy Siting, Soft Cost Reduction, Information Products and Brokering and Pay for Performance (P4P), were previously approved. The Consumer Awareness initiative, funded at \$5.27 million, was approved in 2019 and works across sectors to increase consumer awareness, familiarity, and demand for clean heating and cooling and energy efficiency technologies. The program supports attainment of the NYS SEP goals to reduce GHG emissions through increasing awareness and consideration of energy efficiency and clean heating and cooling technologies. The program will reinforce and expand the reach of other NYSERDA, NYPA and utility programs to maximize the benefits of these technologies in natural gas constrained areas. One other multisector initiative, the Energy Efficiency Soft-Cost Challenge, was cancelled during the year. The initiative was never launched as soft-cost reduction strategies are instead being embedded as components of other investment plans, therefore this separate initiative is no longer necessary.

3.3.3 Communities

The Clean Energy Communities and Community Energy Engagement initiatives are aimed at enabling local governments and communities to implement clean energy projects and were previously approved. The Clean Energy Communities Program will drive energy efficiency and deployment of clean energy by providing technical assistance, outreach, engineering support, tools, and guidance. The Community Energy Engagement Program leverages local organizations to perform outreach to drive energy efficiency and renewable energy adoption in low-to-moderate income (LMI) communities. The Clean Energy Communities initiative was modified during 2019 and added \$67 million to support the Clean Energy Communities Leadership Round, which is an update to the existing Clean Energy Communities program. In the Leadership Round, communities will work with regional coordinators to prioritize and implement high-impact actions, apply for grants that emphasize new activity and impact, and earn new forms

of recognition. The modification also supports Community Choice Aggregation (CCA) partner organizations, a statewide building energy benchmarking platform, and Property Assessed Clean Energy (PACE) financing.

3.3.4 Industrial

The Energy Management Practices initiative (formerly Continuous Energy Improvement) was approved in 2016 and aims to integrate the adoption of energy efficiency and clean energy into companies' core business processes. This initiative includes a pilot to prove the benefit of a fulltime on-site energy manager dedicated to implementing energy efficiency projects in a manufacturing setting. Also, NYSERDA launched Strategic Energy Management system pilots to demonstrate how this continuous improvement approach can lead to sustained energy savings. The initiative was modified during 2019 to add an additional \$18 million in funding. These funds expanded eligibility for the Strategic Energy Management (SEM) component to the commercial sector, adding \$5 million in support for the commercial sector. This modification also added \$3 million to support self-serve SEM activities, and \$10 million in funding to support additional industrial cohorts, with a corresponding increase in benefits. The chapter name was also changed to Energy Management Practices.

3.3.5 REV Technical Assistance

The REV Connect initiative was approved in 2016 and offers a central forum where DER providers can submit project ideas and receive expert guidance and technical support. This can facilitate the matching of ideas with customers, communities, and utilities to advance high-quality REV demonstrations and other innovation projects. The initiative was modified during 2019 to add an addition \$10 million in funding for up to four additional years of continued operations, including maintenance of the submission portal and submission screening and partnership facilitation processes. The update also includes an increased budget to provide funding to support market tests of proposals that are not mature enough for a utility partnership.

3.3.6 Residential

The Residential initiative, formerly Engaging New Markets, was approved in 2017, takes a multifaceted approach to drive energy efficiency in the single-family residential market, through investments targeted at mid-stream and up-stream market actors training and consumer education. Intervention strategies include pilots to influence home purchasing decisions and training of contractors in energy efficiency offerings and tools, such as home energy ratings, with the overall objective to increase the number

of businesses providing energy efficiency services, and consumer demand for these services and energy-efficient homes. The initiative was modified during 2019 to add \$35.9 million to support two additional components; Heat Pump Ready and Green Jobs – Green New York Audits (GJGNY). Heat Pump Ready seeks to create a strong residential market for heat pumps by demonstrating that simplified packages of whole house load reduction measures (air sealing, insulation, duct repair/sealing, and windows) can facilitate sales of envelope improvements and prime customers for accelerated heat pump adoption by making them “heat pump ready.” GJGNY supports the delivery of free energy audits to consumers. The new process will launch in 2020, coordinated with new tools developed to support the “heat pump ready” initiative, and will enable the use of remotely available data sources to pre-populate energy audit data, using the field visit to verify site conditions and provide health and safety checks as needed. Beginning in 2021, NYSERDA will seek to deploy additional automated remote data collection to further reduce the necessity of lengthy on-site inspections.

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 2019 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	NYSERDA’s vision is to serve as a catalyst for advancing energy innovation and technology, transforming New York State’s economy, and empowering people to choose clean and efficient energy as part of their everyday lives.				
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 2019 and the total cumulative acquired progress achieved through December 2019.

Targets for calendar year 2020 are also provided for performance measures, when possible. NYSERDA's targets are expressed on a commitment basis (i.e., having to do with when funds are committed to a specific contractual activity), as commitment-based targets align target setting with the new strategies of the CEF that emphasize engaging market forces toward longer-term, more transformative clean energy outcomes, rather than quick turn-around resource acquisition. Commitment-based targets are the best measure of NYSERDA's success at engaging the market to uncover and address customer value propositions and of NYSERDA's continued endeavors to streamline operations and become more responsive, adaptive, and easier to use. Each metrics table contains three columns on the left side representing a commitment-based view and one column on the right side representing the cumulative total benefits achieved by NYSERDA from completed projects.

- The column **Target CY 2019 Commitments Addition** represents the expected target NYSERDA set in the prior year for additional commitments made during this calendar year.
- The column **Achieved CY 2019 Commitments Addition** represents the commitments NYSERDA achieved during this calendar year.
- The column **Target CY 2020 Commitments Addition** represents NYSERDA's expected target for new commitments made during the calendar year, representing work to build the project pipeline.
- The column **Cumulative Acquired Benefits at end of CY 2019** represents the total benefits NYSERDA achieved from projects that have been completed through 2019.

The quantitative performance measurement data are supplemented with contextual information, as needed and when available, and highlights of additional 2019 accomplishments.

While the listed 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 indicators of progress in the context of these external factors.

Acknowledging COVID-19 Impact

NYSERDA's forecasts are typically done on an annual basis during the first two months of the new calendar year so they can be fully informed by how the last calendar year ended. As such, the forecasts developed in early 2020 were completed prior to the COVID-19 pandemic and the resulting New York on PAUSE Executive Order and subsequent executive orders which placed a priority on the safety and health of every New Yorker. As a result, NYSERDA paused all on-site work conducted by contractors for all of

its clean energy programs through May 15th. Even as field work resumes, the pandemic will have had far-reaching impacts on the economy significantly affecting both residents and businesses but with the full extent of this impact still unknown. NYSERDA is committed to driving continued progress toward NY's clean energy goals and is examining ways that programs can support those goals while also aiding in the State's economic recovery. At this time, NYSERDA's published forecasts represent pre-pandemic expectations, with the recognition that adjustments will be necessary once the impact of the pandemic and all elements of the recovery are better understood.

Table 2 presents NYSERDA's progress toward the efficient use of energy performance measures. Under the CEF, NYSERDA was ordered to achieve minimum projected benefits of 10.6 million megawatt-hours (MWh) and 13.4 million British thermal units (MMBtu) of annual energy efficiency savings at the end of the 10-year funding period (2016-2025). During 2019, NYSERDA's prior round of programs under the Energy Efficiency Portfolio Standard continued to wrap up, while new initiatives under CEF continue to be developed and launched. Performance against energy efficiency delivery targets shown in Table 2 (electricity and fuel saved) exceeded the targets for both MWh, MMBtu, and energy bill savings. The overperformance on electricity saved can be substantially attributed the Energy Management Technology (EMT) and Industrial Transition initiatives. EMT has seen significant market interest and uptake of Real-Time Energy Management (RTEM) and adoption rates in commercial office and multifamily buildings are strong while Industrial transition maintained its consistently strong performance.

Table 2. Performance Measures—Efficient Use of Energy

Performance Measures	Commitment Pipeline			Acquired Benefits
	TARGET CY 2019 Commitments Addition	Achieved CY 2019 Commitments Addition	TARGET CY 2020 Commitments Addition ^c	Cumulative Acquired Benefits at end of CY 2019
Electricity^{a,b} (GWh) saved annually due to improved energy efficiency in New York's buildings and facilities.	792.7	1,217	922.2	8,382
Fossil Fuels^{a,b} (MMBtu) saved (in millions) annually due to improved energy efficiency in New York's buildings and facilities.	4.1	4.9	4.5	21.8
Energy Bill Savings Annual direct energy bill savings realized by participating customers (all programs).	\$158	\$238	\$159	\$1,492

^a Starting in 2016, targets and achieved values include, consistent with NYSERDA CEF reporting, only the energy savings from CHP systems, electric vehicles, air source heat pumps, fuel cells and ground source heat pumps. However, CO₂e emission reductions and customer bill savings are fully net, accounting for both the energy savings and the energy use of these measures.

^b 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 341-GWh installations will be "retired" in 2019. These amounts and the associated emission reduction and customer bill savings have been netted out of the Total Acquired Benefits at End of CY 2019 values reported.

^c As noted, the forecasts driving NYSERDA's targets were completed in early 2020, prior to the novel coronavirus pandemic. The target has not been adjusted in any way to account for the NY on PAUSE Executive Order or the expected economic impact associated with the pandemic. Actual performance will be monitored and reported but is expected to vary from the target."

Table 2a. Comparison Points—Efficient Use of Energy

Comparison Points	
Electricity (GWh)	2018 statewide annual sales of electricity—149,930 GWh ^a
Fossil Fuels (MMBtu)	2016 statewide annual (Residential, Commercial, Industrial) natural gas and petroleum usage—1,003 million MMBtu ^a
Number of New York households served	2018 occupied housing units in NYS—7,367,015 ^b
Number of commercial and industrial customers served	2017 business establishments in NYS—547,034 ^c

^a NYSERDA, Patterns and Trends, Energy Information Administration (EIA), 2020

^b American Community Survey

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

Additional highlights for strategic goal/outcome Efficient Use of Energy:

- Since 1998, NYSERDA-administered energy efficiency programs have saved enough electricity to power more than 1.32 million homes each year and enough natural gas, propane, oil, and other heating fuels to heat 311,818 homes each year.
- More than 930,000 households and 40,100 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’s electric load rose to 26.8% in 2018 from 2014 baseline of 25.9%, an overall increase of 0.9%. 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 RECs to achieve anticipated and minimum results for the years 2017-2021. In January of 2020, the Public Service Commission amended the form of NYSERDA’s RES procurements by formally adopting the Index REC price structure that has been successfully employed by the Offshore Wind program to NYSERDA’s land-based large-scale renewables procurements, which will be offered for the first time under its 2020 RFP.

In addition to the state’s baseline of renewable energy, the State will see significant contributions over the coming years as the result of several procurement programs, including annual solicitations for new large-scale renewables, offshore wind, solar incentive programs, and other State procurements. New York has a contracted pipeline of more than 21,000 GWh of renewable generation projects.

NY-Sun commitments in 2019 were greater than expected and were driven heavily by new Community Solar development. Several policy improvements enabled this robust development. The Phase Two VDER Order (April 22, 2019) made significant improvements to the Value Stack compensation tariff

and introduced greater revenue certainty to developers. The Order also introduced a new incentive for Community Solar in the form of the Community Credit, which drove significant development, especially in NYSEG and National Grid territories. In addition to strong Community Solar development, the market saw significant development in ConEd territory in both the residential and the nonresidential sectors. Finally, opportunities in the energy storage market, including the new NYSERDA Energy Storage retail incentive, drove development of PV projects paired with storage.

Table 3. Performance Measures—Renewable and Diverse Energy

Performance Measures	Commitment Pipeline			Acquired Benefits
	TARGET CY 2019 Commitments Addition	Achieved CY 2019 Commitment Addition	TARGET CY 2020 Commitments Addition ^b	Cumulative Acquired Benefits at end of CY 2019
Renewable resources electricity produced				
1) Annual Electricity Production (GWh) delivered to wholesale power market from incentivized installations ^c	8,655 ^a	9,688 ^a	5,770	2,207 ^c
2) Annual Electricity Production (GWh) from on-site installations ^d	863	1,152	1,282	2,299
Solar PV capacity (GW) from all NYSERDA funded solar PV programs, including NY-Sun 3 GW goal^c	0.6	0.8	0.8	1.651

- ^a The target and achieved addition for 2019 have been adjusted based to include actual commitments for Offshore Wind which had previously not been included. The Offshore wind target and actual MWhs assumptions were based on a NYSERDA capacity factor estimate of 48%.
- ^b As noted, the forecasts driving NYSERDA’s targets were completed in early 2020, prior to the novel coronavirus pandemic. The target has not been adjusted in any way to account for the NY on PAUSE Executive Order or the expected economic impact associated with the pandemic. Actual performance will be monitored and reported but is expected to vary from the target
- ^c 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.
- ^d NYSERDA does not, by filing this report, make any claim to the environmental attributes associated with those 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.

Table 3a: Comparison Points—Renewable and Diverse Energy

Comparison Points	
New York Load Served by Renewables^a	2018 Renewable Energy Serving Load – 26.8% (42,162 GWh’s)

- ^a CES Annual Progress Report – 2018 <https://www.nyserdera.ny.gov/-/media/Files/Publications/Energy-Analysis/RPS/2019-Clean-Energy-Standard-Annual-Progress-Report.pdf>

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

- NYSERDA is currently supporting 116 large-scale renewable generation projects representing 5,243 MW of renewable generation capacity. There are 46 facilities operating with the remainder of the projects under design and construction.
- NYSERDA is also supporting two offshore wind generating projects, which are both under design and construction, and once operating will represent 1,696 MW of renewable capacity.
- Of 83 communities awarded funding to conduct feasibility assessments at Stage 1 of the NY Prize Competition, all but one completed their Stage 1 assessment and the completed assessments are posted to the NY Prize website. Of those communities that vied for funding to conduct detailed engineering design and commercial/financial plans at Stage 2 of the competition, 11 were awarded nearly \$11 million and the Stage 2 projects have completed their work. Several projects completed final designs and business models while a few projects determined they were not financially viable and terminated design work.

Table 4 presents NYSERDA’s progress toward the clean energy economy performance measures. Procurement activities by NYSERDA include the issuance of the third RES solicitations in 2019. Combined with the renewable energy projects previously announced under Governor Cuomo’s Clean Energy Standard, New York has now awarded 67 projects worth more than \$4 billion.

Table 4. Performance Measures—Clean Energy Economy

Performance Measures	Commitment Pipeline			Acquired Benefits
	TARGET CY 2019 Commitment Addition	Achieved CY 2019 Commitment Addition	TARGET CY 2020 Commitments Addition ^d	Cumulative Acquired Benefits at end of CY 2019
Total funding leveraged from all NYSERDA investments (\$million) ^{a,b}	\$11,401 ^c	\$11,968 ^c	\$8,457	\$15,620

- 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.
- c The target and achieved addition for 2019 has been adjusted based to include actual commitments for Offshore Wind which had previously not been included.
- d As noted, the forecasts driving NYSERDA’s targets were completed in early 2020, prior to the novel coronavirus pandemic. The target has not been adjusted in any way to account for the NY on PAUSE Executive Order or the expected economic impact associated with the pandemic. Actual performance will be monitored and reported but is expected to vary from the target

Additional highlights for strategic goal/outcome Clean Energy Economy:

- As a component of the leveraged funding presented in Table 4, NYSERDA’s investment in technology and business development has leveraged \$275 million in 2019 for a total of \$1,703 million through the end of calendar year 2019.
- As a result of NYSERDA’s technology and business development investments, there are more than 526 new and improved clean energy products in the market (including 59 new products added in 2019) in all end-use energy sectors from high-efficiency furnaces to advanced lighting controls and hybrid electric buses.
- As of the end of 2019, there are currently 114 new clean energy products in development with support from NYSERDA’s technology and business development programs.
- As of the end of 2019, annual sales of products developed with NYSERDA support have reached approximately \$2,521 million.
- As of the end of 2019, there are currently 94 clean energy businesses receiving financial support from NYSERDA’s technology and business development programs.
- NYSERDA’s incubator program, which supports six cleantech incubators across the State, assisted 84 clients and helped these startups raise more than \$472 million in private capital as well as almost \$108 million of non-NYSERDA grant funding, while generating and retaining, 1,910 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 2019 target for carbon reductions was exceeded (achieving 110%) and can be attributed to the increased overall procurement amount in excess of the anticipated target from the 2019 CES solicitation.

Table 5. Performance Measures—A Cleaner Environment

Performance Measures	Commitment Pipeline			Acquired Benefits
	TARGET CY 2019 Commitment Addition	Achieved CY 2019 Commitment Addition	TARGET CY 2020 Commitments Addition ^b	Cumulative Acquired Benefits at end of CY 2019
CO₂ equivalent emission reductions due to NYSERDA’s energy efficiency, renewable and diverse energy programs (annual metric tons) (All programs)	5,556,056 ^a	6,172,915 ^a	4,208,209	8,396,350

- a The target and achieved addition for 2019 has been adjusted based to include actual commitments for Offshore Wind which had previously not been included.
- b As noted, the forecasts driving NYSERDA’s targets were completed in early 2020, prior to the novel coronavirus pandemic. The target has not been adjusted in any way to account for the NY on PAUSE Executive Order or the expected economic impact associated with the pandemic. Actual performance will be monitored and reported but is expected to vary from the target

Table 5a: Comparison Points—A Cleaner Environment

Comparison Points	
CO ₂ equivalent emission reductions ^a	2016 annual NYS power sector emissions—22 million metric tons CO ₂

- a (1) U.S. Energy Information Administration. "Table 4. 2017 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 CLCPA.

Energy-related environmental policies in 2019 informed by NYSERDA reports/studies:

- Program Staff in coordination with the New York State Department of Environmental Conservation (NYSDEC), and the Responsible Offshore Development Alliance hosted an offshore wind related fishing transit workshop to gather feedback relating to how commercial fishermen transit the New York Bight. The workshop outputs will inform the Bureau of Ocean Energy Management (BOEM) about how offshore wind lease areas could be designed in the New York Bight.
- NYSERDA Environmental Research held a two-day multi-disciplinary workshop on Energy-related Air Quality and Health Effects Research Workshop in Albany, NY. The 145 participants included staff from federal and state energy, air quality, and public health agencies, researchers and graduate students in these areas, as well representatives from the power industry.
- June 2019, NYSERDA hosted a workshop, Developing Effective State and Local Government Programs to Control Emissions from Residential Wood Heating Devices. Participants were primarily state air regulators or public health staff from states across the country and regional air quality organizations. Along with technical topics, the workshop included a strategic discussion of opportunities and challenges associated with developing state programs.
- The Program published New York State Mercury Connections, a communications document designed to educate policy makers and the general public about the impacts of mercury. The document served as the basis for NYSERDA and scientists briefing of the New York State Attorney General’s Office and the NYSDEC as well as staff from the US Senate and House offices and the US Environmental Protection Agency (USEPA) on the efficacy of the MATS rule.
- NYSERDA developed the first of its kind offshore wind environmental and fisheries mitigation plan process that was a requirement of proposers to NYSERDA’s first offshore wind procurement. The approach supports transparency and productive stakeholder engagement to advance responsible offshore wind development.
- NYSERDA released guidance to help non-coastal communities consider their current and future flood risk. The “toolkit” will help communities better understand these potential changes by using existing inland flood assessment resources. It aims to help local planners and decision makers managers determine which resources to use for their communities and provides step-by-step guidance on how to use those resources.
- For the first time a pellet boiler manufacturer requested and was granted approval by US EPA to test five pellet boilers for certification using the Integrated-Duty Cycle (IDC) test protocol as an Alternative Test Method. The IDC protocol was developed with NYSERDA support and evaluates efficiency and emissions performance under more realistic in-use conditions than EPA’s current test protocol.

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 strong performance with regard to prompt payment of invoices. Overall Cycle Time for the Authority improved with a 50% improvement in open enrollment (automated) and open enrollment / task work orders due to improvements made over the past several years. Cycle time increased slightly for direct contract/contract modifications and due date solicitations but is attributed to the nature of the solicitations and contracts that were managed during the year.

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

CONTRACT AND CYCLE TIME—INVOICING					
<i>NYSERDA is responsive to customer needs—delivering accurate and timely information, services, and programs.</i>					
Performance Measures	CY 2017	CY 2018	TARGET CY 2019	CY 2019	TARGET CY 2020
Invoice payment:					
1) Number of invoices paid within 30 days	65,210 invoices	72,053 invoices	***a	79,756 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)

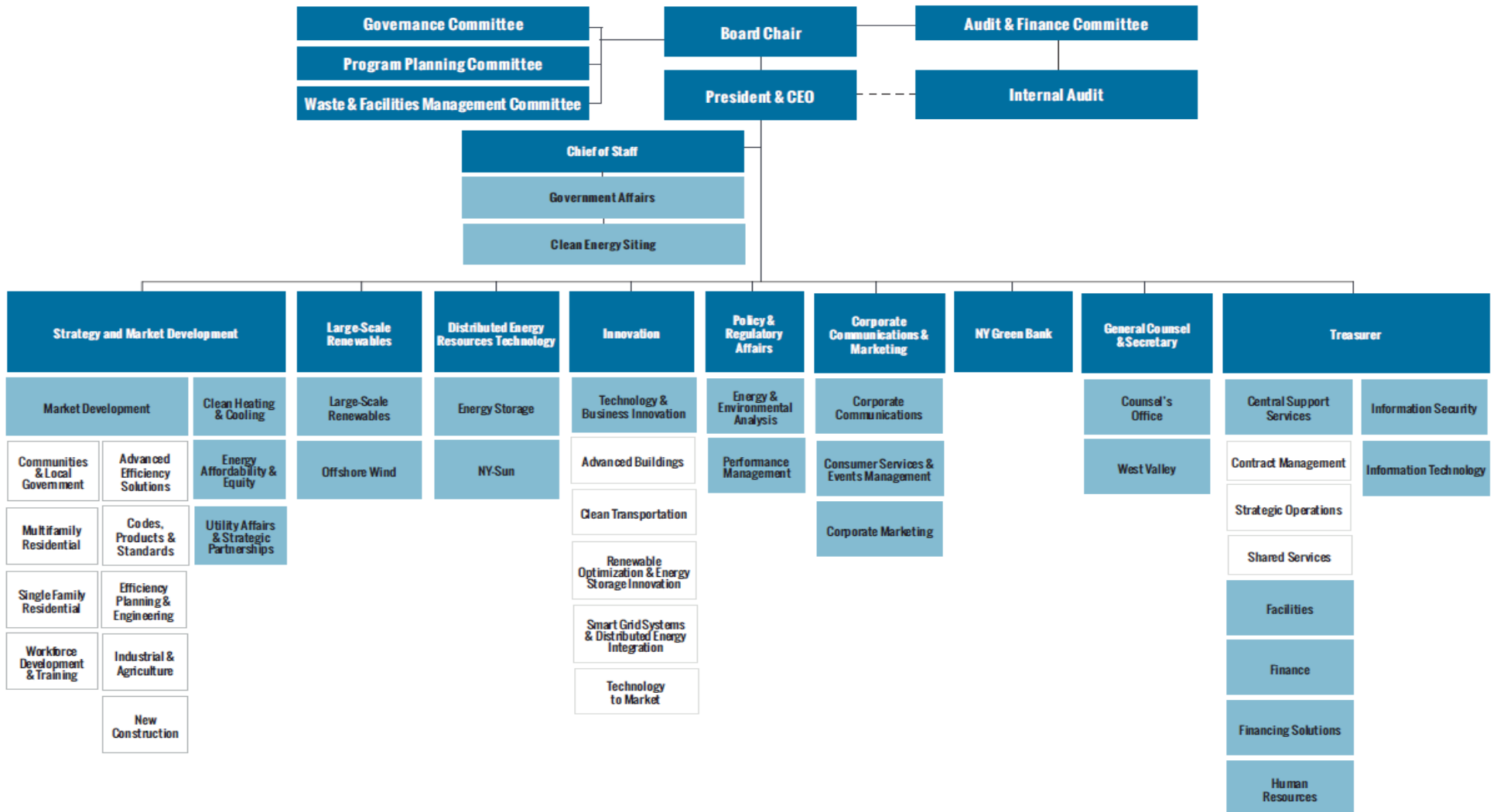
CONTRACT AND CYCLE TIME—SOLICITATIONS				
<i>NYSERDA is responsive to customer needs—delivering accurate and timely information, services and programs.</i>				
Performance Measures	CY 2018 Median Total No. of Weeks	Target CY 2019	CY 2019 Median Total No. of Weeks	Target CY 2020
Contract Processing Time—Median time to Process (Weeks):				
1) Due Date Solicitations	30.86	32	33.14	32
2) Open Enrollment and Task Work Orders	2	2	1	2
3) Open Enrollment (Automated) ^a	0.85	1	0.43	1
4) All Other Actions (Direct Contracts and Contract Modifications)	1	3	1.86	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 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 in buildings by increasing private sector investment in smart building technologies and services. Initiatives run by the Advanced Efficiency Solutions team advance commercially available solutions that deliver both energy efficiency and leverage

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 statewide supply chain

5.7 Efficiency Planning and Engineering

The Efficiency Planning and Engineering Team is an inter-disciplinary group whose primary goal is to increase clean energy investment in commercial buildings. To accomplish this goal the Team engages with commercial stakeholders, sector organizations, service providers and customers to deliver monetary and informational incentives. Sector specific initiatives such as REV Campus Challenge, Commercial Tenant, and the P-12 Initiative are examples of targeted efforts the Team focuses on.

5.7 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.

5.8 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.

5.9 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.

5.10 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. Solar thermal, biomass heating, and air and ground source heat pump systems will be explored. Clean heating and cooling will 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 Affordability and 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 our 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 also 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 renewables 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 Public Service Commission.

5.14 Offshore Wind

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 Public Service Commission to acquire offshore wind renewable energy credits (ORECs).

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 and 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 Technology and Business Innovation

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 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 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.
- Clean Transportation: Accelerate the movement toward an efficient, low-GHG emissions transportation system—enhancing the quality of life in communities across the 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 and make NYS the place for innovation.

5.18 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.

5.19 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.