Toward a Clean Energy Future:

A Strategic Outlook 2020–2023

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

Message from President and CEO

The call to act on climate change reached new heights during the September 2019 Climate Week, with the youth movement and climate strikes in New York City and across the nation driving home the urgency and importance of addressing **one of the most pressing matters of our time**.

Governor Cuomo's nation leading **Green New Deal** and the New York State **Climate Leadership and Community Protection Act (CLCPA)** have been at the forefront of creating the framework needed to lower carbon emissions and advance a clean energy future. New York has embraced sweeping change, and with that commitment has launched a plan that will ensure a just transition as we work towards energy efficiency, community resilience, and bringing clean energy jobs to our State.

New York State is on the path to achieving a **carbon free electricity system by 2040**, and ultimately a carbon-neutral economy, touching on all areas including transportation, buildings, and industrial production. The CLCPA sets a new standard, codifying New York's goal of **70% renewable energy by 2030**, while also **cutting greenhouse gas emissions 85% by 2050**.

NYSERDA is at the heart of efforts to jump-start progress towards the State's unprecedented clean energy and carbon reduction mandates. In 2019, Governor Cuomo announced NYSERDA's first two offshore wind projects, totaling nearly 1,700 megawatts that will create enough energy to power over 1 million homes. This represents the single largest renewable energy procurement by any state in U.S. history and is just the first step in achieving **9,000 megawatts of offshore wind by 2035**. It solidifies New York State's position as the hub of the nation's offshore wind industry and these awards will **spur more than 1,600 jobs** with a combined **economic activity of $3.2 billion** across the State.

New York has been building momentum under Governor Cuomo for many years through strong and consistent climate and clean energy actions. This includes scaling up grid modernization, energy storage, and solar to ensure flexibility, reliability, and resilience. This work provides the necessary foundation to support the fast-paced addition of renewables to meet the ramp-up of **3,000 megawatts of energy storage** and **6,000 megawatts of distributed solar**.

70%
renewable energy by 2030

85%
reduction of GHG gas emissions by 2050

carbon free electricity system by 2040

Just as we are creating the sustainable infrastructures and resources needed to bring renewable energy markets to scale across the economy, we recognize that along with significant changes to the energy system, our own action and the actions of other State agencies play a key role in lasting change. NYSERDA and other State agencies are building resiliency measures into our own operations and programs as part of the comprehensive approach to strategically integrate innovation and resources needed to transition to a carbon-free economy.

Through proper planning we will ensure that the clean energy transition meets the needs of low- to moderate-income workers and families. **35% of the benefits of the State's clean energy and energy efficiency investments will benefit disadvantaged communities**, as well as improve energy affordability for all New Yorkers. As we move from carbon to carbon-neutral, it's critical to identify and plan for a shift in economic and market changes which will ensure that the State and our residents will ultimately be stronger, with a healthier environment and better quality of life.

In light of the CLCPA, as well as a number of other drivers in the energy space, including bold action at the local level and changes in utility strategies, 2020 will be an important year for NYSERDA to reassess strategies to pursue going forward to ensure we are best meeting the needs of a changing energy landscape.

It is a proud time to work in clean energy, the opportunities keep growing and will continue to do so. This Strategic Outlook highlights how we will continue to leverage and build on our success to date showing that good thought leadership combined with new technologies and pushing innovation are at the core of a better, more resilient future.

Alicia Barton, President and CEO, NYSERDA

This forward-looking document reflects State policy and NYSERDA's plans as of January 2020. Because New York's energy policy objectives continue to develop in response to the evidence that aggressive action is needed to combat climate change—and greater ambition is possible—updates to particular targets will be noted on the Strategic Outlook webpage: **nyserda.ny.gov/Strategic-Outlook.**

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NYSERDA and Its Context

NYSERDA'S CHARGE

Mission:

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

Vision:

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

NYSERDA develops markets for clean energy, supports technology development, and provides financing—all in support of transforming the energy system to enable economic growth and reduce greenhouse gas emissions, while building sustainable communities.

STATE POLICIES AND COMMITMENTS THAT STEER NYSERDA'S WORK

New York — a founding member of organizations like the Regional Greenhouse Gas Initiative (RGGI) and the U.S. Climate Alliance — aims to meet the energy-related challenges posed by climate change. Governor Cuomo's Green New Deal, the most aggressive climate and clean energy initiative in the nation, sets New York on a path for a just transition to clean energy, spurring the growth of the green economy while prioritizing the needs of low- to moderate-income New Yorkers.

As co-chair of the State's Climate Action Council, NYSERDA plays a critical role in charting the direction of New York's energy policies.

now

CLEAN ENERGY ECONOMY
nearly 159,000 clean energy jobs

by 2025

RENEWABLE ENERGY
6,000 MW of distributed solar

RESILIENT and DISTRIBUTED GRID
1,500 MW of energy storage

ENERGY EFFICIENCY
185 TBtu end-use savings
in buildings and industrial facilities

by 2030

RENEWABLE ENERGY/ CLEAN ENERGY STANDARD
70% electricity from renewable energy

GHG REDUCTION
40% reduction in greenhouse gas emissions from 1990 levels

3,000 MW of energy storage
30,000 employed in storage sector

NYSERDA'S ROLE

As New York's clean energy and innovation agency, NYSERDA leads the way in implementing the State's nation-leading clean energy policy and actions, delivering a cleaner, healthier, and more prosperous future for all New Yorkers.

NYSERDA is on the front lines of a global energy transition, bringing energy expertise to the challenges of fighting climate change and accelerating the pace to a clean energy future.

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. NYSERDA focuses on:

- De-risking transitions from technological and business model innovation to broad commercialization.
- Reducing hard and soft costs of stimulating clean energy development by coordinating demand and focusing the efforts of key stakeholders, as well as by supporting technological innovation.
- Instilling confidence in markets and consumers through information, credible analysis, and education.
- Increasing market participants' access to capital on commercial terms by creating attractive precedents and standardizing approaches that capital providers can readily replicate and scale up.
- Providing targeted financial support where up-front costs present a persistent barrier, such as for low- to moderate-income consumers.
- Fostering investigation of and capacity to undertake ambitious measures for the long-term.

RENEWABLE ENERGY
9,000 MW of offshore wind
by 2035

CARBON-FREE
100% clean electricity
by 2040

GHG REDUCTION
85% reduction in greenhouse gas emissions from 1990 levels
by 2050

POLICY FRAMEWORK

The landscape and policy framework surrounding NYSERDA's work has changed rapidly over the past year. Key drivers of change include:

- Passage of New York's Climate Leadership and Community Protection Act (CLCPA). Governor Cuomo signed the CLCPA into law on July 18, 2019, dramatically raising the bar for the level of ambition that New York State needs to achieve.
  - Existing policies have been expanded or accelerated.
  - Initiatives and objectives are now in statute.
- CLCPA places substantially increased focus and priority on:
  - Increasing access to (and benefits from) clean energy for disadvantaged communities and low-income consumers.
  - Creating quality jobs in the green economy and ensuring a "just transition" and protecting ordinary workers as our economy shifts to more sustainable production.
  - Sectors of the economy that require deeper decarbonization (e.g. transportation, buildings).
- Bold action at the local level, particularly the **Climate Mobilization Act** in New York City (NYC), requires unprecedented coordination between the State and local government.
- The transition from dependence on natural gas to clean energy is being actively debated in light of new CLCPA requirements and on-the-ground supply/demand realities.
- Under New Efficiency New York, utility investment in energy efficiency will increase substantially over the next few years — coupled with short timelines for achieving targets, the imperative to align NYSERDA's role and the role of utilities has never been higher.
- The transportation sector contributes the most emissions by category across New York State (36% in 2016); making deep in-roads in this sector will require a comprehensive strategy on decarbonizing transportation.
- Weather events are increasing in frequency and severity, and energy infrastructure will increasingly come under strain.
  - Need to pivot our thinking to make sure we are building clean energy infrastructure that will adapt to changing conditions.

These new drivers of change build upon ongoing challenges and priorities that have not changed and must continue as core areas of focus:

- Aging energy infrastructure and large pre-existing built environment.
- Need to ensure energy affordability for all New Yorkers as energy system changes are implemented.
- Need to leverage market activity and private capital to achieve aggressive policy goals.
- Need to continue building public support for difficult systematic changes such as expanding support for large-scale projects and changing consumer behavior over time.

NYSERDA needs to align policy and program offerings to these new considerations, including the key strategies and policies outlined on the next page.

NYC Climate Mobilization Act

The NYC Climate Mobilization Act is a package of bills which represent a path for NYC to reach carbon neutrality by 2050.

The centerpiece of the law is Local Law 97, which requires buildings over 25,000 square feet to cut climate emissions 40% by 2030.

This requirement covers approximately 50,000 existing residential and commercial buildings and nearly 60 percent of the city's building area – 3.15 billion square feet.

Climate Leadership and Community Protection Act

affirms Governor Cuomo's Green New Deal's nation leading clean energy targets, while calling for an orderly and just transition to clean energy that creates jobs and continues fostering a green economy — 35% of clean energy and energy efficiency investments will benefit disadvantaged communities

State Energy Plan

quadrennial interagency policy coordination effort that steers energy policy

Clean Energy Standard

designed to transform the generation of electricity to carbon-free and renewable resources

Clean Energy Fund

$5 billion fund for four key program portfolios:

> Market Development

> NY-Sun

> NY Green Bank

> Innovation & Research

New Efficiency: New York

comprehensive set of strategies for delivering energy efficiency gains

Charge NY

transportation emissions reductions through build-out of electric vehicles market and infrastructure

U.S. Climate Alliance

bipartisan coalition of 24 states and Puerto Rico committed to achieving the goals of the Paris Agreement

Executive Order 166

calls on all State agencies to "lead by example" and realize GHG emissions reductions through their operations and programs

Regional Greenhouse Gas Initiative (RGGI)

a cooperative effort among several states to cap and reduce CO_2 emissions from power plants

Mission Outcomes and Strategic Focus Areas for 2020-2023

NYSERDA's primary mission outcomes are presented in the following pages. For each outcome, NYSERDA strategies over the planning horizon are presented along with a summary of NYSERDA's unique role in delivering on the critical outcome. Indicators of progress are also presented to ensure that movement in the market and progress toward these goals can be tracked.

The mission outcomes that NYSERDA seeks to advance to support the energy transformation in New York include:

GREENHOUSE GAS EMISSIONS REDUCTION

RENEWABLE ENERGY

ENERGY EFFICIENCY

CLEAN ENERGY ECONOMY

RESILIENT AND DISTRIBUTED ENERGY SYSTEM

These mission outcomes cover every aspect of our economy. Over the planning horizon, NYSERDA will focus on the following strategic focus areas which are critical to achieving our long-term energy and greenhouse gas emissions reduction goals:

BUILDING A RESILIENT ENERGY SYSTEM

ENERGY AFFORDABILITY AND EQUITY

DECARBONIZING TRANSPORTATION

ELECTRIFICATION OF BUILDINGS

Greenhouse Gas Emissions Reduction

STATE POLICY GOAL
FOR GREENHOUSE GAS (GHG) EMISSIONS REDUCTION

The CLCPA sets a greenhouse gas reduction target of 40% by 2030 and 85% by 2050, each below 1990 levels.

Hitting these targets will enable the State to advance economy wide carbon neutrality. In other words, it would mean that New York is doing its part to reduce the causes of climate change.

Mission Outcome:

Greenhouse Gas Emissions Reduction

NYSERDA'S ROLE

Co-Chair Climate Action Council to craft roadmap of policies needed to achieve goals in CLCPA.

Guide and facilitate the State Energy Plan development and shape energy policies throughout New York State.

Identify and implement strategies for energy sector emissions reductions.

Develop and track statewide greenhouse gas inventory.

Facilitate State agencies' efforts to Lead-by-Example.

INDICATORS OF PROGRESS

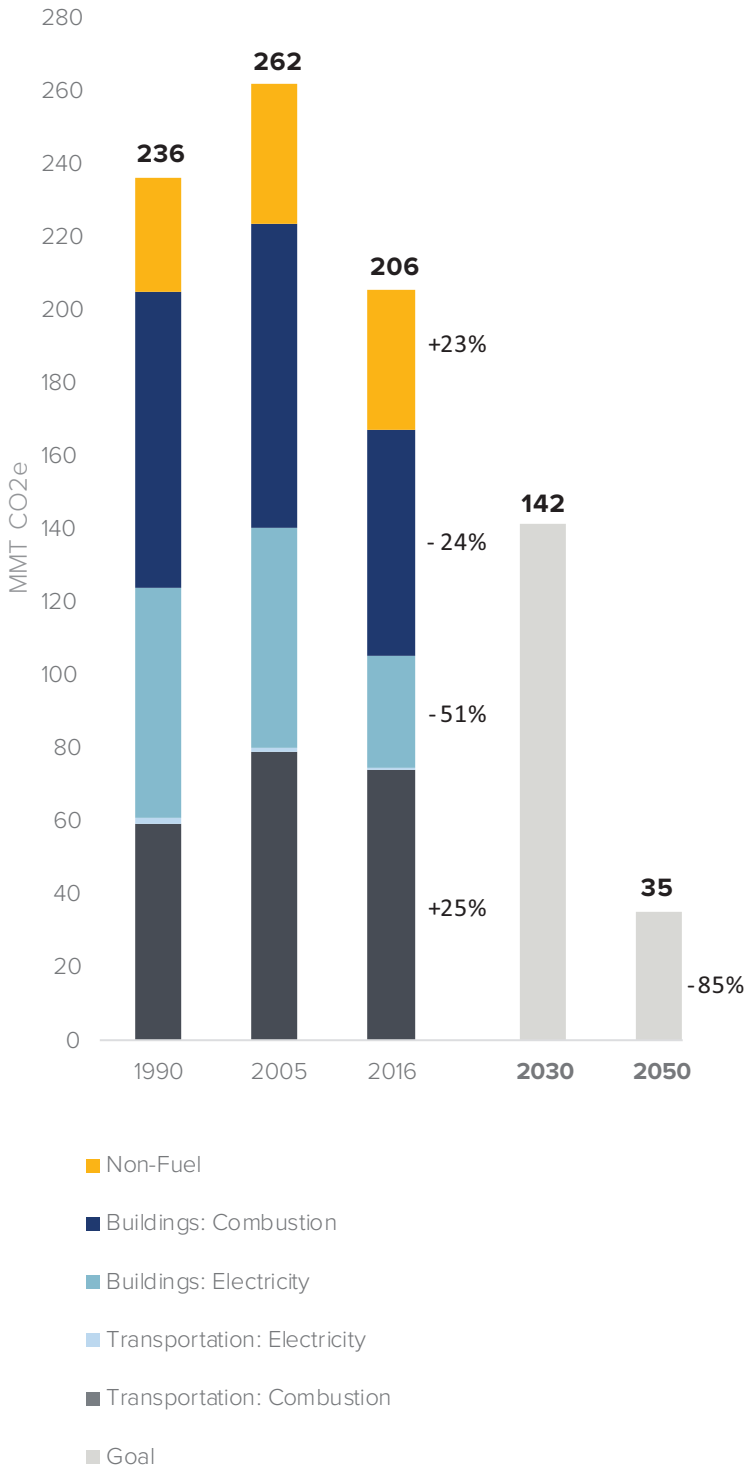
- Levels and trends in greenhouse gas emissions from sources statewide
- Number of Clean Energy Communities
- Progress on key metrics for renewables, energy efficiency, and beneficial electrification (i.e., electric vehicles, and clean heating and cooling)

STRATEGIES FOR 2020–2023

- Develop final Scoping Plan by 2023 to identify path to achieve a 40% reduction by 2030 and 85% reduction in GHG emissions by 2050.
- Develop and publish Carbon Neutral Buildings Roadmap.
- Develop and publish a Clean Transportation Roadmap.
- Educate policymakers and the public through information sharing and connecting individual energy use to climate impacts.
- Advance New York's climate leadership through support of the State's participation in the U.S. Climate Alliance.
- Advance solutions to drive emissions reductions in all areas of New York's economy — electricity, buildings, transportation and beyond — and promote growth of beneficial electrification technologies that meaningfully contribute to the State's emissions reduction goals.
- Help communities across New York implement their own sustainability and clean energy goals, including coordinating with NYC on Local Law 97.

The CLCPA codified Governor Cuomo's historic commitment to transforming New York State's electricity sector to be 100% carbon-free by 2040

2050 target:
85% reduction
from 1990 emissions baseline



HIGHLIGHTED PROGRAMS AND INITIATIVES

Clean Energy Fund accelerates the deployment of clean energy solutions while driving economic development

Regional Greenhouse Gas Initiative (RGGI) assigns a price to power plant emissions and directs revenue to clean energy initiatives

Charge NY reduces transportation emissions through build-out of electric vehicles market and infrastructure

Carbon Neutral Buildings Roadmap will establish path to achieve carbon neutral buildings by mid-century, including interim 2030 milestones for various building sectors

Clean Transportation Roadmap will provide a blueprint for actions to support decarbonization of vehicular traffic, including short- and long-term goals for EV sales and charging stations

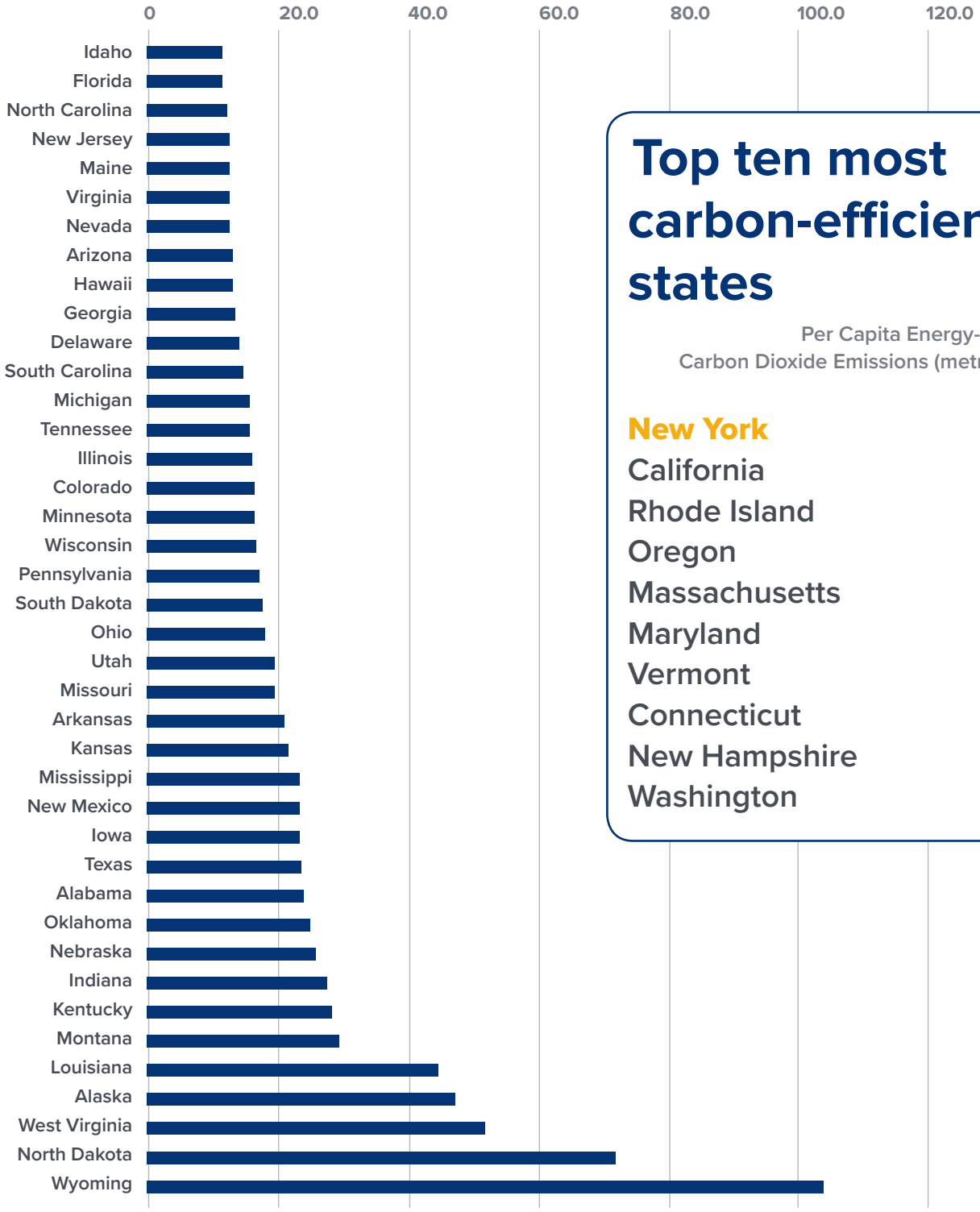
Blue Ribbon Task Force on EVs will be co-led by NYSERDA and Professor M. Stanley Whittingham from Binghamton University to identify technology and research and development opportunities for EVs

Clean Energy Communities recognizes and rewards communities for implementing clean energy actions that save taxpayer dollars, create jobs, and improve the environment

New York State is the most carbon-efficient state in the United States on a per capita basis and is well on its way to achieving the level of emissions reduction outlined under the Paris Agreement.

Source: U.S. Energy Information Administration, State Energy Data System and EIA calculations made for this analysis.

PER CAPITA ENERGY-RELATED CARBON DIOXIDE EMISSIONS (METRIC TONS)



Top ten most carbon-efficient states

	Per Capita Energy-Related Carbon Dioxide Emissions (metric tons)
New York	**8.3**
California	9.2
Rhode Island	9.2
Oregon	9.3
Massachusetts	9.4
Maryland	9.6
Vermont	9.6
Connecticut	9.6
New Hampshire	10.3
Washington	10.8

Renewable Energy

STATE POLICY GOAL
FOR RENEWABLE ENERGY

The CLCPA mandates that at least 70% of New York's electricity come from renewable energy sources such as wind and solar by 2030.

Achievement of this mandate will move the State closer to achieving its climate goals, improve air quality, and continue to broaden New Yorkers' access to energy sources with low or no fuel costs. This clean electricity system lays the groundwork for decarbonization of the transportation and buildings sector through beneficial electrification.

Mission Outcome:

Renewable Energy

NYSERDA'S ROLE

Facilitate market growth and sustained markets for renewable and zero-emission generation.

Reduce renewable soft costs and barriers to deployment.

Build community support for renewables.

Spur cost reductions through innovation.

Build supply chain and workforce capabilities.

Provide financing.

STRATEGIES FOR 2020–2023

- Accelerate strategies and mechanisms to achieve the new 70% renewable goal, as part of the next generation of the Clean Energy Standard.
- Continue to expand cost effective and competitive solicitations for large-scale renewables, refining program rules to reflect market conditions.
- Continue issuing solicitations for offshore wind that spur competition and cost reductions, including second solicitation for at least 1,000 MW in 2020, and build the supply chain in New York State.
- Develop strategies and mechanisms to achieve the 6,000 MW distributed solar goal by 2025, including strategies to serve low-income communities and consumers.
- Reduce soft costs and siting barriers by assisting local governments, providing financing for new market models via the NY Green Bank, addressing interconnection hurdles, and building support statewide.

INDICATORS OF PROGRESS

- MWh: progress toward target
- MW and facilities (large-scale and behind-the-meter) completed and in the pipeline
- Solar, onshore, and offshore wind projects' average capital cost and timelines to develop and construct

New York State continues to grow a strong pipeline of projects to meet the 70x30 goal. As of November 30, 2019, there were approximately

35 GW of active renewable, renewable transmission, and storage projects in the NYISO interconnection queue.

Additionally, there are currently 39 projects in the active Article 10 Queue, with three applications being approved in the last year, indicating more of the pipeline is coming to fruition.

2030 Clean Energy Standard target:

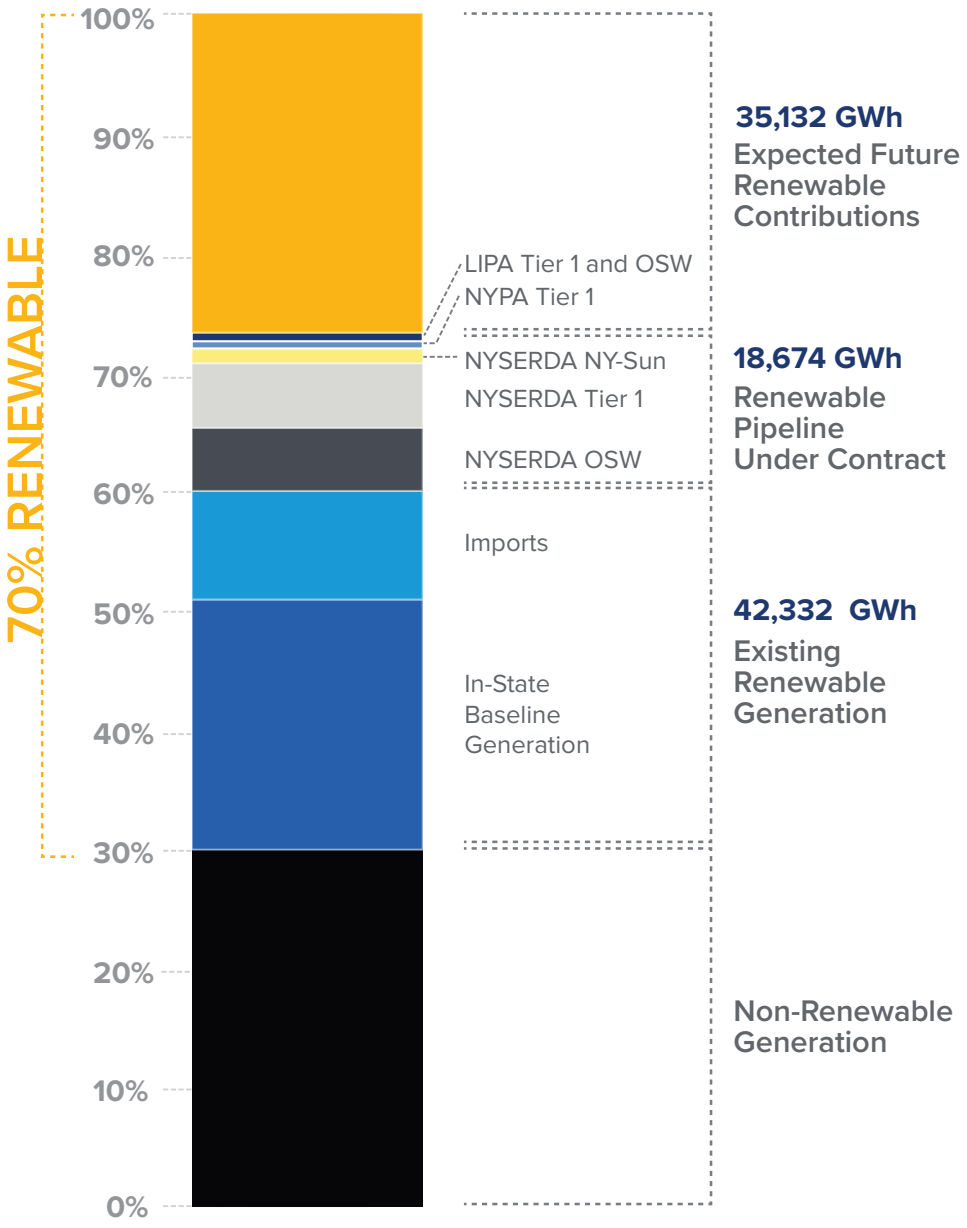
70% electricity

from renewable sources

PROGRESS TOWARDS 70X30 GOAL

98,694 GWh to reach goal*

** GWH required to meet goal is based on 2016 Clean Energy Standard Order load projection for 2030 and is subject to change.*



HIGHLIGHTED PROGRAMS AND INITIATIVES

Community Solar makes solar affordable and accessible for all New Yorkers

Solar for All makes subscriptions to community solar projects available at no cost for low income consumers

Solar PV + Storage funds deployment of solar with onsite storage capacity

Large-Scale Renewables supports the development of dozens of large-scale renewable energy projects

Offshore Wind establishes significant, cost effective, renewable generation source with promise of new industry in New York

The CLCPA ramps up renewable energy goals, including:

QUADRUPLING NEW YORK'S OFFSHORE WIND TARGET TO

9,000 MW BY 2035

up from 2,400 MW by 2030

DOUBLING DISTRIBUTED SOLAR DEPLOYMENT TO

6,000 MW BY 2025

up from 3,000 MW by 2023

New York has awarded a total of approximately 6,000 megawatts of new large-scale renewable energy contracts since March 2018 through four separate solicitations — a globally significant advancement in renewable energy in just two years. Collectively, these projects will provide enough renewable energy to power more than two million households and meet roughly 10% of New York's electricity needs by 2025.

PSC PROCESS TO AMEND CLEAN ENERGY STANDARD AS PER CLCPA

By June 30, 2021, PSC shall establish a program to require that:

- a minimum of 70% of statewide electricity be renewable by 2030.
- statewide electricity be zero carbon emission by 2040.

Energy Efficiency

STATE POLICY GOAL
FOR ENERGY EFFICIENCY

New York set a 2025 statewide energy efficiency target of 185 TBtu of cumulative site energy savings relative to forecasted energy consumption in 2025.

Hitting this target will mean achieving the energy efficiency goal set in the 2015 State Energy Plan five years early and will deliver nearly one-third of the greenhouse gas emissions reduction needed to meet New York's interim 40x30 climate goal, a necessary milestone in reaching the 85% reduction in GHG emissions by 2050 goal in the CLCPA. Also, energy efficiency through electrification of heating load will put New York's building sector on a course to carbon neutrality.

Mission Outcome:

Energy Efficiency

NYSERDA'S ROLE

Develop and manage programs to eliminate barriers and increase adoption of energy efficiency, providing financial and technical assistance to solution providers and consumers, including low-income consumers.

Develop and demonstrate strategies to achieve deep energy savings.

Provide technical assistance through energy codes and appliance standards to improve energy efficiency across the State.

Provide financing for energy efficiency market participants.

INDICATORS OF PROGRESS

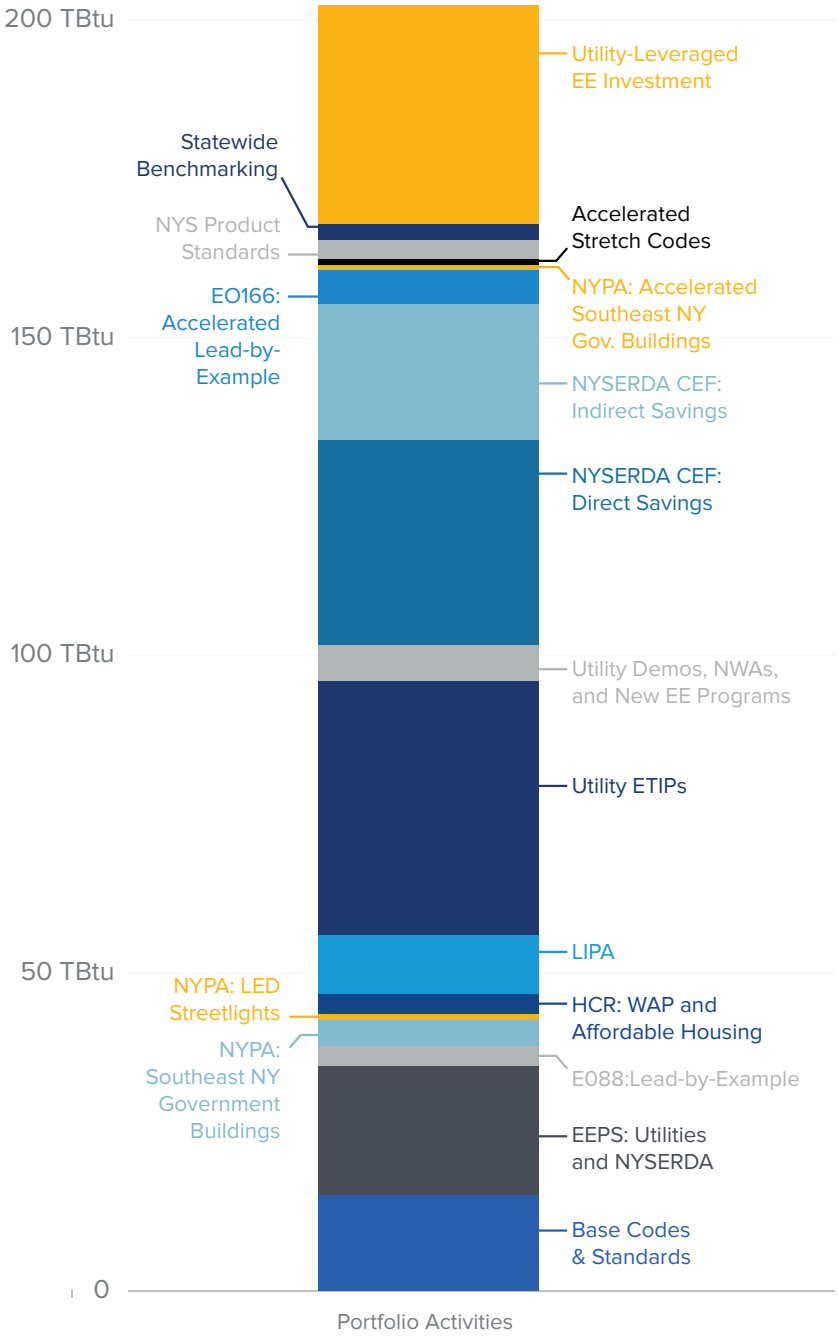
- Avoided energy use: natural gas, electricity, and combined total in Btu
- New York State's Clean Energy Dashboard, found here: rev.ny.gov/cleanenergydashboard

STRATEGIES FOR 2020–2023

- Develop a robust portfolio of programs for low-income consumers and disadvantaged communities, in coordination with utilities.
- Develop a roadmap for a statewide carbon neutral building stock which incorporates deep efficiency, more efficient heating and cooling technologies, and grid-connected capability.
- Drive deeper levels of efficiency and carbon savings in buildings using a variety of strategies including peer-based challenges, support of long-term energy planning within the capital improvement cycle, and development and demonstration of new solutions to deliver higher performing/healthier buildings.
- In partnership with utilities, launch a comprehensive building electrification initiative with consumer incentives and market support to move New York toward all-electric homes and buildings and accelerate transition away from natural gas and fossil fuel.
- Provide support for consumers in gas constrained areas of New York by providing information and assistance to adopt energy efficiency and clean heating solutions.
- Increase consumer awareness and provide decision-quality information on energy efficiency opportunities for building owners and tenants — capitalizing on key points in a building life cycle (e.g., tenant turnover, major renovations, property transfer).
- Advance applications of "Intelligent Efficiency" — using sensors, improved analytics, communications, and streamlined M&V.
- Leverage comparative data and information through strategies such as building benchmarking and labeling to drive consumer adoption of energy efficiency.
- Support statewide improvement in energy efficiency through improved appliance standards and adoption of advanced building codes, with a goal of establishing a statewide mandatory net zero-carbon building code by 2031.

2025 energy efficiency targets will reduce energy consumption by the equivalent of 1.8 million homes annually and create as many as 50,000 new jobs

2025 target:
185 TBtu
of onsite energy savings*



** Graphic does not reflect roughly 15 TBtu of overlap between policies*

HIGHLIGHTED PROGRAMS AND INITIATIVES

Healthy Homes Pilot with Department of Health to integrate health services with home energy efficiency improvements and safety measures

LMI Zero Energy Modular Homes to develop the market for high efficiency modular homes

Home Comfort to develop standardized envelope solutions to improve energy performance and make homes heat pump ready

Buildings of Excellence competition for creation of net zero multifamily buildings

New Construction to support Net Zero Residential and Commercial buildings

Commercial Tenant program to improve interior office and leased spaces through design, proactive maintenance and operations, and actionable plans to reduce energy consumption

Empire Building Challenge to demonstrate scalable and replicable solutions for high profile commercial and multifamily buildings

Public Service Commission Orders on New Efficiency New York more than doubled utility investment in energy efficiency. Through 2025, New York State will invest over $6.8 Billion in energy efficiency, leveraging utilities and NYSERDA.

Clean Energy Economy

STATE POLICY GOAL
FOR THE CLEAN ENERGY ECONOMY

As a direct outgrowth of New York's efforts to transform its energy system and reduce its GHG emissions, the State has developed a large and growing green economy.

With nearly 159,000 clean energy jobs across the State and 8.9% job growth since 2016 — double the statewide job growth average — New York's nation-leading climate policies are driving investment and job-creation in clean energy solutions like wind, solar, energy efficiency, and energy storage. Despite additional growth projected in the near-term (our jobs report forecasts more than 170,000 jobs for next year), NYSERDA and fellow agencies will need to continue to grow this workforce to ensure that companies have access to necessary skilled labor, especially in emerging sectors like clean heating and cooling.

Achieving the CLCPA's nation-leading goals will mean not only expanded deployment of existing technologies, but also substantial investment in the State's clean energy innovation economy to develop entirely new solutions for a low-carbon future. New York's ecosystem of start-ups will develop these technology and business-model solutions for demonstration and use in New York, as well as for export to markets across the globe.

NYSERDA will leverage this demand for new solutions in New York to attract clean energy companies from all ends of the supply chain looking to serve the growing local market, solidifying and expanding New York's status as a hub for companies developing and deploying innovative solutions on a global scale. To help expedite this vision for a clean energy economy, the State is placing new focus on proactive and purposeful cross-agency collaboration to attract clean energy manufacturing and supply chain companies to invest and locate in New York State.

NYSERDA will seek to unlock and mobilize private capital to further build, finance, and grow this clean energy economy. All these efforts will seek to create new economic opportunity and quality jobs for New Yorkers, including those New Yorkers who have been historically disadvantaged and who may be affected by the transition away from fossil fuels.

Mission Outcome:

Clean Energy Economy

NYSERDA'S ROLE

Address barriers to mobilization of private capital **and financing** for clean energy projects.

Foster capital attraction and support commercialization of products and services from clean energy startups, as well as innovative utility rate structures.

Unlock new job growth, such as offshore wind port infrastructure investments and competitions for deep commercial building retrofits.

Provide workforce development programs to develop the human resources needed to build the clean energy economy, support a just transition for historically disadvantaged populations and industries affected by the transition away from fossil fuels, and support host communities with a site reuse toolkit and consulting assistance.

INDICATORS OF PROGRESS

- Clean energy jobs
- Commercialized solutions to building electrification needs and related revenues
- Launch of incubated firms
- "Mobilization ratio" of total capital to NY Green Bank capital

STRATEGIES FOR 2020–2023

NY Green Bank

- Invest in clean energy and sustainable infrastructure, including in support of priority energy efficiency and energy storage initiatives.
- Begin deploying $100m in EV-related financing, as announced in 2020 State of the State.
- Continue efforts to raise at least $1 billion in private capital.
- Continue issuing targeted RFPs and organizing convenings in strategic areas to grow the clean energy investment pipeline.

Innovation

- Support development of innovative solutions to electrify and reduce the heating and cooling loads of buildings through advanced heating & cooling solutions and advanced building cladding, including phase change materials, and healthy, pollutant-free insulation.
- Develop advanced EV-enabling technologies and smart mobility solutions to reduce GHGs and air pollutants harmful to human health.
- Support integrated grid planning to enable connected buildings, electric vehicles, and other grid edge, including developing the technology and equipment that can enable grid interactivity, as well innovative utility rate structures and tariffs that will drive end users to buy and implement the technology.
- Lead National Offshore Wind R&D Consortium.
- Co-lead Blue Ribbon Task Force on EVs with Professor Whittingham.

Workforce Development

- Ensure that individuals working in conventional energy industries are provided with training and opportunities in the growing clean energy economy.
- Ensure training curricula and programmatic support respond to industry needs.
- Provide targeted support to offset risks that might prevent clean energy firms from hiring or training.
- Deploy additional $40m announced in 2020 State of the State to train 40,000 workers over the next five years.
- Support launch of $20m Offshore Wind Training Institute and establishment of SUNY partnerships to meet industry ramp-up.

NYSERDA'S ROLE: SUPPORT BY STAGE

Startup Formation

- Proof-of-Concept Centers

Achieve Proof-of-Concept

- Proof-of-Concept Centers
- Incubators
- Entrepreneurs-in-Residence
- Research, Development, and Demonstration Grants and Collaboration

Develop and Market Test

- Proof-of-Concept Centers
- Incubators
- Ignition Grants
- Entrepreneurs-in-Residence
- Co-Investment Fund
- Research, Development, and Demonstration Grants and Collaboration

Commercialize

- Incubators
- Ignition Grants
- Manufacturing Corps
- Entrepreneurs-in-Residence
- NYS Cleantech Venture Exchange
- Co-Investment Fund
- 76West
- Research, Development, and Demonstration Grants and Collaboration

Launch at Scale

- Manufacturing Corps
- Entrepreneurs-in-Residence
- NYS Cleantech Venture Exchange
- Co-Investment Fund
- 76West
- Business Model Innovation
- Research, Development, and Demonstration Grants and Collaboration

HIGHLIGHTED PROGRAMS AND INITIATIVES

NY Green Bank works with the private sector to increase investments into New York's clean energy markets

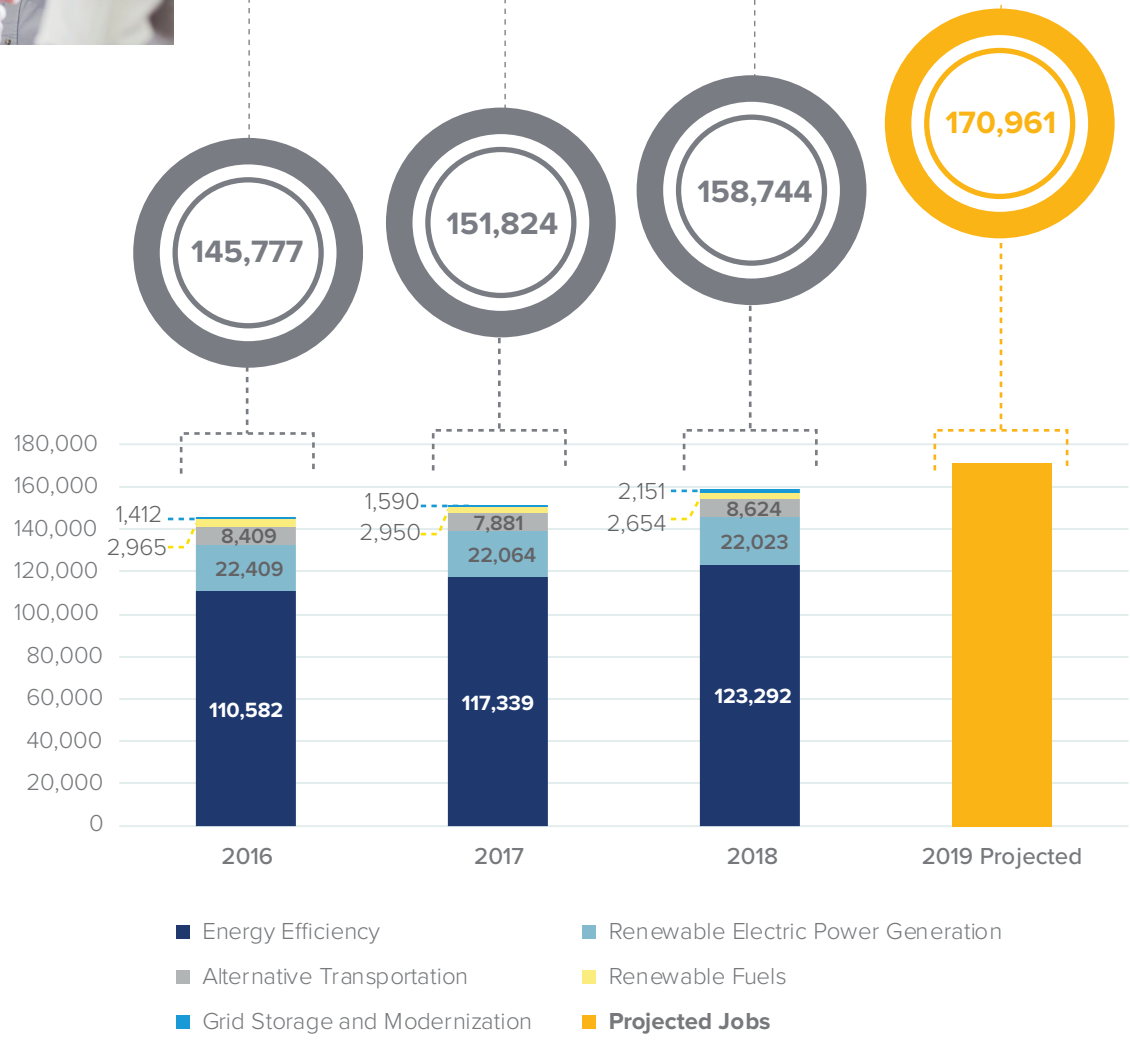
Innovation supports companies involved in sustainability and reducing energy usage and carbon emissions, with a focus on those conducting applied research through Series B, with a suite of strategically located resources

Workforce Development supports training for building management staff; on-the-job training for new clean energy workers; and clean energy sector talent pipeline

New York's clean energy industry is already one of the fastest-growing sectors in New York's economy

CLEAN ENERGY JOBS ACROSS TECHNOLOGY CATEGORIES, 2016–2018

Source 2019 Clean Energy Industry Report



Resilient and Distributed Energy System

STATE POLICY GOAL
FOR THE ENERGY SYSTEM

New York State aims to modernize the electric grid in ways that improve resilience to disruption, enable greater flexibility, reduce costs, and support the integration of higher volumes of distributed and renewable energy resources.

These goals stand on their own but are also critical sources of system stability as New York progresses toward its 70x30 renewables target and addresses climate-driven and other hazards to energy system functions.

Mission Outcome:

Resilient and Distributed Energy System

NYSERDA'S ROLE

Ensure resiliency is factored into State programs and investment in clean energy infrastructure.

Spur development and integration of smart grid technologies.

Provide information and insight about distributed energy resource integration for policymakers and stakeholders.

INDICATORS OF PROGRESS

- Progress toward storage deployment goal 3,000 megawatts by 2030
- Solutions to grid challenges developed

STRATEGIES FOR 2020–2023

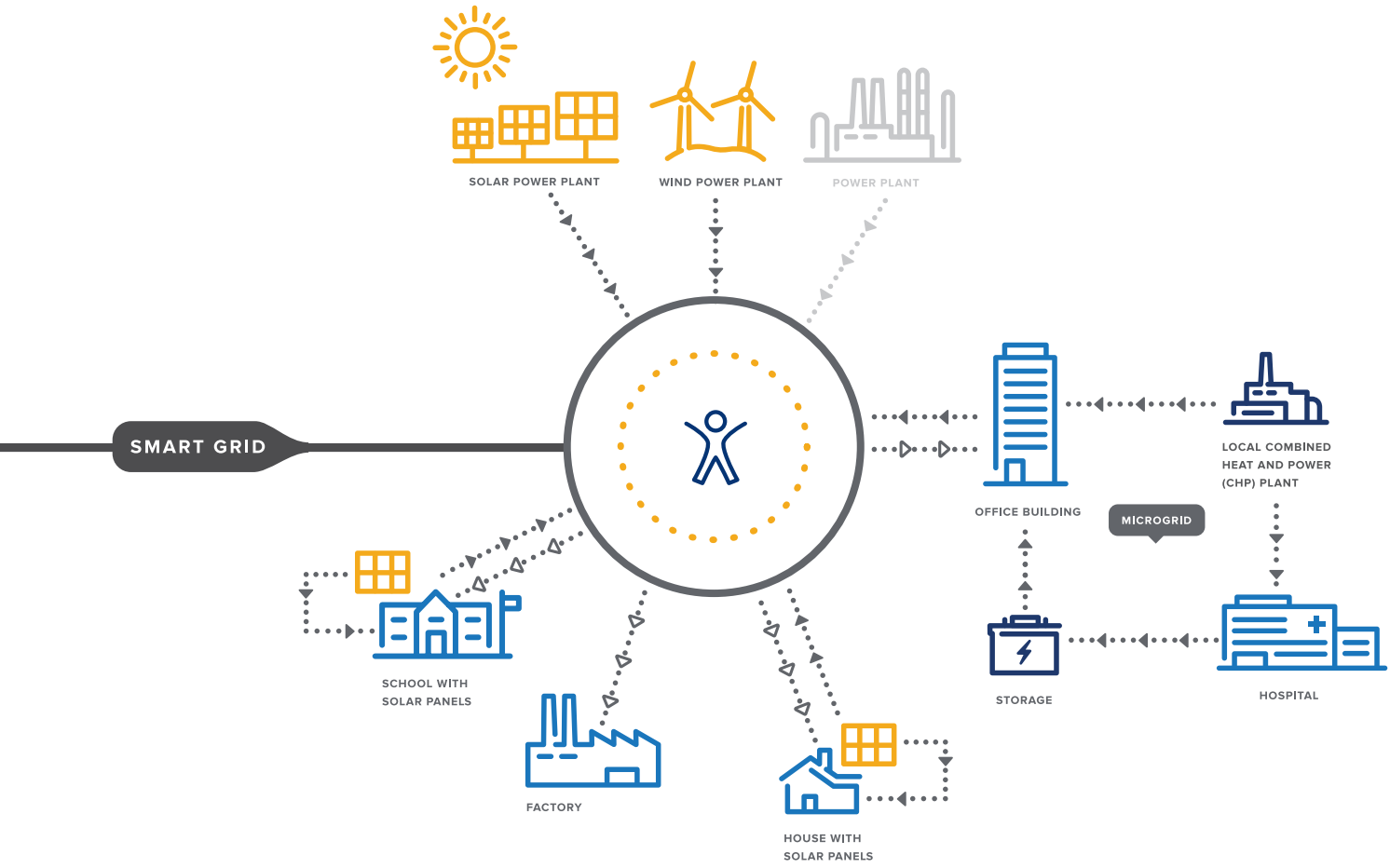
- Incorporate resilience considerations into NYSERDA programs, to ensure that investments are protected against future climate impacts.
- Maximize renewable energy content in resiliency solutions, including pairing renewables, storage and Distributed Energy Resources (DER) for on-site resiliency.
- Explore cost reductions through smart grid technologies.
- Continue to support research and development activities for the State that strengthen our analytical understanding of the energy system in transition and the environmental benefits and impacts that such changes will bring to ensure promotion of robust, well-informed policy measures.
- Promote localization of workforce development and economic benefit opportunities to strengthen socio-economic resiliency in our State's transition to the CLCPA goal, particularly in low-income and disadvantaged communities.

HIGHLIGHTED PROGRAMS

Future Grid Challenge helps solve technical challenges utilities face with energy transmission and distribution when integrating renewable energy resources

Energy Storage engages those involved in building, installing, integrating, or researching energy storage technology

Fuel NY makes fueling stations resilient to power system outages


SOLAR POWER PLANT
WIND POWER PLANT
POWER PLANT
SMART GRID
OFFICE BUILDING
LOCAL COMBINED
HEAT AND POWER
(CHP) PLANT
MICROGRID
SCHOOL WITH
SOLAR PANELS
STORAGE
HOSPITAL
FACTORY
HOUSE WITH
SOLAR PANELS

Building a Resilient Energy System

LONG-TERM VISION AND VALUE PROPOSITION

With billions of dollars committed to the clean energy sector, the State's transition to a carbon-free economy needs to be done in a resilient, sustainable manner that anticipates the long-term impacts associated with climate change.

KEY CHALLENGES/BARRIERS

- Climate change is expected to have a diverse range of impacts across New York State within this century—increased temperatures, sea level rise, and increased frequency of extreme events such as heat waves, heavy downpours, and coastal flooding—requiring strategies that allow systems to adapt to future climate conditions.[1]
- Climate resilience is an emerging area of study within clean energy; approaches and methods to bolster resilience in clean energy programs need to be developed.
- A balance needs to be struck in optimizing for maximum resilience benefit without impeding clean energy deployment.
- Difficulty quantifying the full value of resilience.

PRIORITY ACTIONS FOR NEW YORK

- Improve the State's resilience to the impacts of climate change, including both physical assets and the populations they serve.
- Exercise a global leadership role on both GHG mitigation and climate change adaptation.
- Protect low-income and disadvantaged communities from the impacts of climate change and severe weather events.
- Assess the risks of climate change on proposed energy infrastructure projects in the State.

NYSERDA KEY ACTIONS FOR 2020-2023

- **Incorporate resiliency provisions into PV, offshore wind, and large-scale renewables** in order to ensure the investments are protected against future climate impacts. This will include working with the New York State offshore wind regulatory working group to ensure that offshore wind projects are designed and permitted in a way that considers climate resilience (e.g. substation upgrades, cable burial depths), as well as assessing opportunities to better direct large scale renewables siting to areas that present lower land-use and ecosystem conflicts and greater grid resiliency benefits.
- **Develop a framework and toolkit** for deployment across other NYSERDA infrastructure investments to incorporate resilience into decision-making processes.
- **Accelerate adoption of the resilience framework** and consideration for initiatives with near-term structural decisions such as the CEF, CES and NY-Sun filings with the Department of Public Service.
- **Address siting in high-risk locations** (e.g., future flood zones) and develop guidance for programs such as NY-Sun, Energy Storage, Large-Scale Renewables, and New Construction through provision of information and, where necessary, enhanced technical requirements.
- **Explore passive survivability** (i.e., the ability of a building to maintain critical life-support conditions during a loss of power) to better understand the role of deep efficiency in increasing the ability of building occupants to weather power outages.
- **Identify and articulate the resiliency co-benefits of energy efficiency and clean energy measures** (e.g., passive survivability) to increase market adoption of these measures by demonstrating the multiple benefits to the customer.
- **Explore strategies that maximize resiliency benefits** from on-site energy storage and renewable technologies during grid outages and extreme weather events
- **Explore strategies** to better understand the vulnerability of and increase the resiliency of beneficial electrification and clean heating systems.

[1] *nyserda.ny.gov/ClimAID*

Energy Affordability and Equity

LONG-TERM VISION AND VALUE PROPOSITION

With the signing of the CLCPA, equity in climate outcomes for disadvantaged communities is a co-equal objective to achieving emissions reductions.

The adoption of clean energy solutions can drive long-term energy affordability impacts and improve the health and safety of residents. As the clean energy economy continues to develop, NYSERDA will work with other State agencies, utilities, industry, and communities to identify solutions to scale the adoption of clean energy technologies and ensure access to clean energy solutions for low- to moderate-income (LMI) residents and disadvantaged communities.

KEY CHALLENGES/BARRIERS

- 48% of New Yorkers are low- and moderate-income consumers who on-average face significant energy burdens.
- Access to capital, split incentives, and fragmented administration of key programs present barriers to scaling adoption of clean energy solutions in the LMI market segment.
- Size of income-eligible/disadvantaged population requires innovative approaches to achieve scale.

PRIORITY ACTIONS FOR NEW YORK

- Align State resources and strategy to increase public investment in energy affordability and access.
- Expand reach of energy efficiency and weatherization programs.
- Leverage regulatory, policy, and financing mechanisms to increase adoption of clean energy solutions in affordable housing.
- Introduce energy storage and on-site generation as a measure to provide resilience in disadvantaged communities.
- Advance equity in clean transportation.
- Improve transparency and accountability to stakeholder input; increase participation of community members in decision making.

NYSERDA KEY ACTIONS FOR 2020-2023

- **Carry out CLCPA requirements** in coordination with the Climate Action Council and associated working groups.
- **Implement a statewide LMI portfolio** with the investor-owned utilities that increases the impact of ratepayer-funded LMI initiatives.
- **Invest in development of replicable models** for achieving a healthier built environment and carbon neutrality in LMI and otherwise disadvantaged communities.
- **Identify scalable models** for adoption of heat pump solutions/ beneficial electrification in the LMI market segment.
- **Invest in the development of carbon neutral and zero energy modular new construction** as an alternative to traditional manufactured housing and an option for urban infill applications.
- **Provide targeted clean energy job opportunities and training** for priority populations to support a just transition, along with support and resources for host communities navigating power plant retirement.
- **Improve community-level outreach and engagement** to increase access to clean energy solutions and improve energy literacy.

Provide opportunities

for under- or unemployed individuals to access clean energy job opportunities.

Expand access to solar

for LMI households, communities, and affordable housing.

Quantify and maximize health and other non-energy benefits

associated with clean energy improvements in LMI communities.

Decarbonizing Transportation

LONG-TERM VISION AND VALUE PROPOSITION

The transportation sector is the largest source of greenhouse gas emissions in New York.

Achieving New York's emissions reduction goals will require widespread shifts to zero-emission vehicles paired with an expansion of the availability and use of efficient transportation modes, like public transit, biking, and walking. By identifying new market opportunities and facilitating the adoption of new technologies, strategies, and policies, NYSERDA can make electric vehicles and other clean transportation options more affordable, accessible, and widely available across New York State.

KEY CHALLENGES/BARRIERS

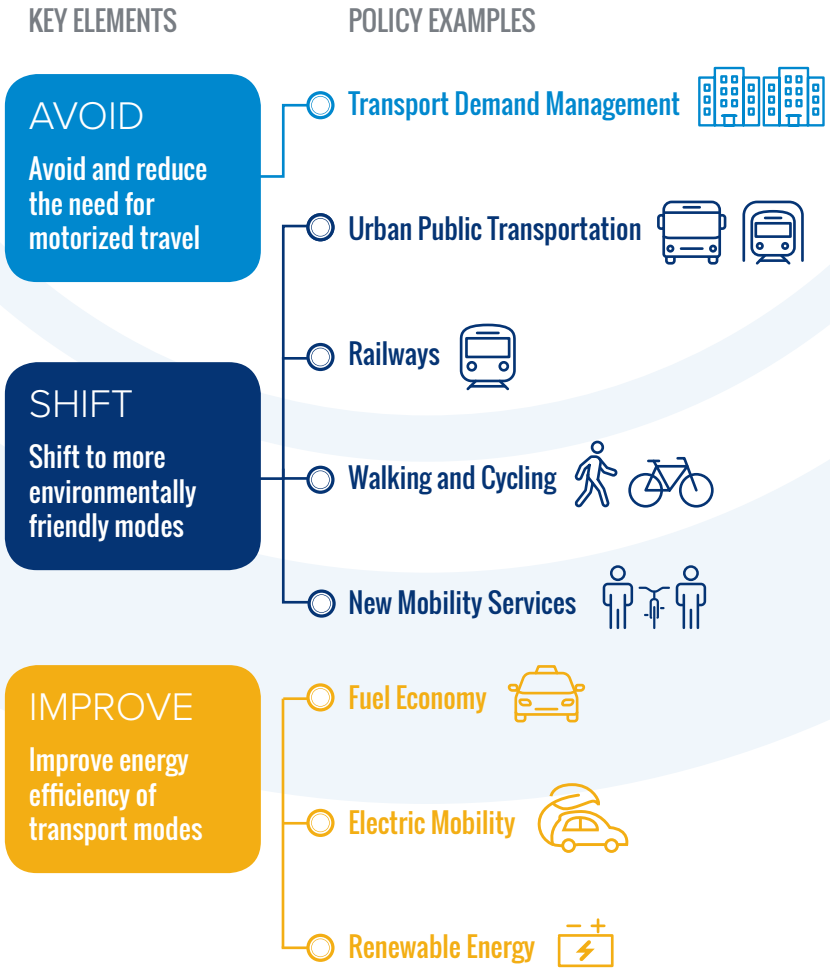
- Federal rollback of fuel economy standards, California waiver.
- High price differential between EVs and gasoline/diesel vehicles, lack of vehicle models available.
- Low consumer awareness and acceptance of EVs, especially among LMI customers.
- Lack of solutions for minimizing grid impacts of fast charging and maximizing grid benefits through off-peak charging.
- Slow expansion of new mobility services and technologies beyond major urban centers due to resource constraints, lack of documented benefits.
- Lack of public transit service outside NYC, stress on the public transit system in NYC.

PRIORITY ACTIONS FOR NEW YORK

- Develop comprehensive transportation strategy to achieve goals of CLCPA.
- Continue working with CA and other states to protect ZEV mandate.
- Develop new strategies and financing opportunities for vehicle electrification and smart mobility solutions.
- Expand charging infrastructure to support growing number of EVs on the road while minimizing impacts and costs for the electric grid.
- Engage partners to increase consumer awareness and acceptance of EVs.
- Increase availability of clean mobility options and transportation modes — transit, biking, walking, and shared mobility — across urban, suburban, and rural settings, with particular focus on disadvantaged populations.
- Explore and institute market-based mechanisms for reducing transportation sector GHG emissions to support broader investment in clean transportation choices.

NYSERDA KEY ACTIONS FOR 2020-2023

- **Develop clean transportation roadmap** to identify market needs and policies to meet them.
- **Co-lead Blue Ribbon Task Force on EVs** with Professor Whittingham of Binghamton University, as announced in Governor Cuomo's 2020 State of the State address.
- **Continue flagship Charge NY incentive programs** and expand their reach to more LMI customers.
- **Support new product development** and innovative demonstrations of clean transportation technologies and services.
- **Initiate mobility competition** to support new, integrated mobility options in small- and medium-sized cities.
- **Work with NY Green Bank and private sector partners** to expand financing options for new transportation products and services, begin deploying $100m in EV-related financing as announced in 2020 State of the State.
- **Support efforts by community-based groups** to engage and educate consumers about EVs and other clean transportation options.



Electrification of Buildings

LONG-TERM VISION AND VALUE PROPOSITION

New York State will be investing over $450 million in heat pump incentives through utilities and over $200 million in market enabling support through NYSERDA.

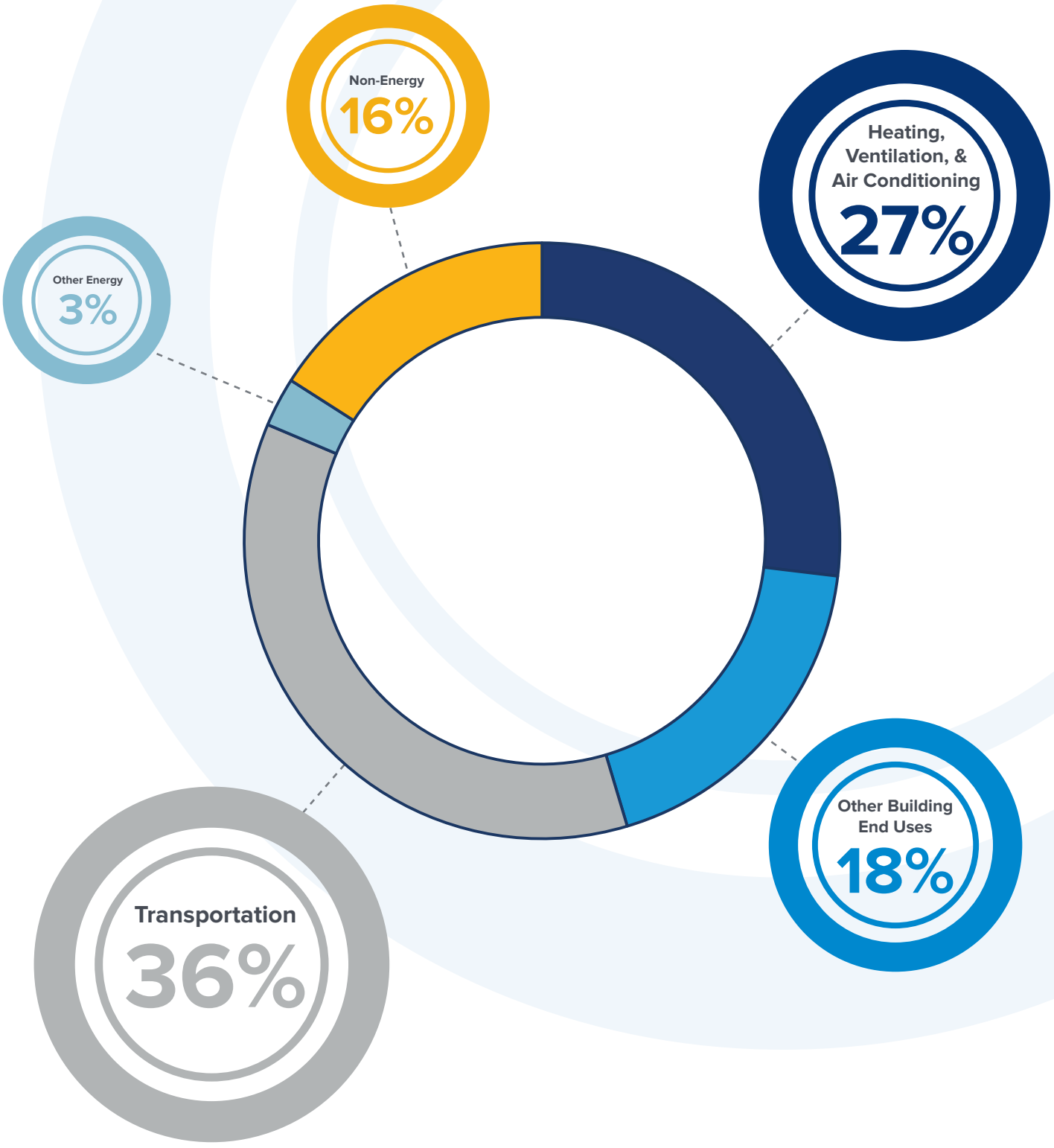
Achieving New York's aggressive emissions reduction goals will require a complete transformation in how New Yorkers heat and cool buildings, moving from fossil fuel-based systems to all-electric clean energy homes and buildings.

This new initiative, called NY-Clean Heat, will pair consumer incentives with market-enabling initiatives to deliver electrification solutions to New Yorkers.

By increasing the adoption of cutting-edge clean energy technologies such as air source and ground source heat pumps, building electrification will become a critical component of the transition to a carbon-neutral economy as directed by the CLCPA. The initiative will transform the marketplace for heating in New York, and initial activities will be designed to grow the clean heat installer market and deliver a 20% reduction in installation cost by 2025, putting New York at the center of the regional market for these technologies in the Northeast.

These efforts will also specifically seek to grow New York's green economy by incorporating efforts to attract global supply chain investments in this new and significant market for the industry. The building electrification initiative will also prioritize investments in and support for low-income New Yorkers, improving energy affordability and health outcomes, and advancing the objectives of the CLCPA.

ESTIMATED GHG EMISSIONS FROM HEATING AND COOLING AS A SHARE OF TOTAL NEW YORK STATE EMISSIONS IN 2016



KEY CHALLENGES/BARRIERS

- High costs to electrify systems compared to fossil fuel alternatives.
- Lack of consumer awareness and education about clean heating and cooling options.
- Shortage of qualified labor such as installation and service technicians needed to rapidly scale the market.
- Reluctance in the HVAC and general contractor communities in transitioning their business and service models away from fossil fuel systems.

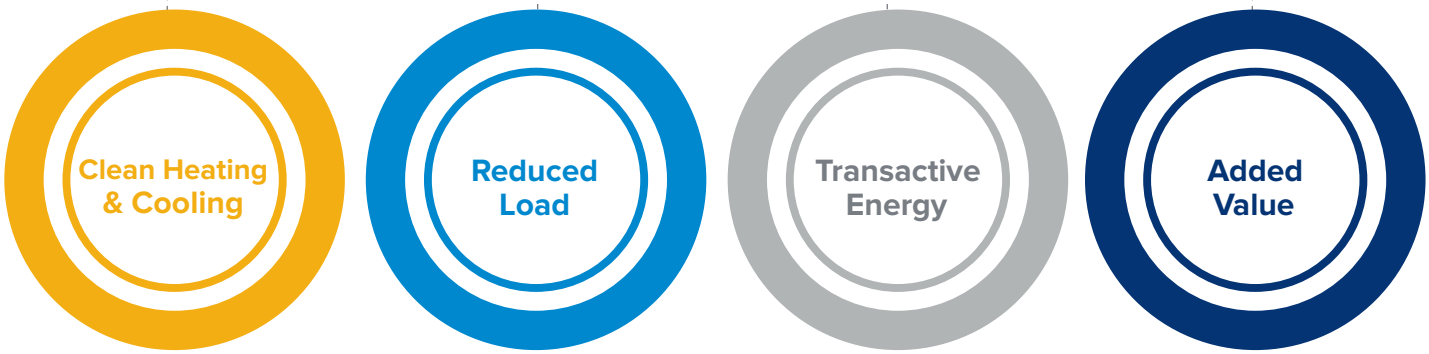
PRIORITY ACTIONS FOR NEW YORK

- Develop a long-term roadmap for advancing all-electric clean homes and buildings in New York consistent with the goals of a carbon-neutral economy.
- Provide consumer incentives through New Efficiency New York to increase the affordability of electrification solutions for residents and businesses in New York while delivering 4.6 Trillion Btu of energy savings.
- Build market capacity, expand product availability, and drive cost reductions in electrification solutions such as air source and ground source heat pumps.
- Review natural gas policy structure to ensure that alternative heating solutions can compete on a level playing field.

NYSERDA KEY ACTIONS FOR 2020-2023

- **Workforce development for building electrification and energy efficiency** — Increase pool of skilled labor and industry partnerships to rapidly scale the nascent heat pump industry, providing economic opportunity for New Yorkers, including by making use of $40 million in workforce development funding announced in 2020 State of the State.
- **Beneficial Electrification for Low-and-Moderate Income (LMI) Consumers** — Support development of electrification solutions that can benefit LMI consumers, addressing both affordability and technical issues associated with the low-income building stock.
- **Consumer Awareness and Market Engagement for Clean Heat and Energy Efficiency** — Ensure that New Yorkers are aware of clean energy alternatives for heating and cooling homes and businesses, while reducing energy waste. Build demand and reduce customer acquisition costs for heat pumps and energy efficiency.
- **Clean Heat Community Engagement and Assistance** — Provide support to communities and local groups to stimulate adoption of heat pumps along with building envelope solutions, while leveraging local labor.
- **Clean Thermal District System** — Test and demonstrate potentially scalable models for clean thermal district systems, using a NY-Prize style approach.
- **Clean Heat Supply Chain Development** — Support development activities to draw larger HVAC companies and general contractors into the heat pump business and grow businesses that are selling/servicing heat pumps.
- **Heat-Pump-Ready Buildings** — Build markets for insulation and air sealing services to accompany new heat pump solutions, to reduce thermal load and peak energy demands and increase home comfort.
- **Energy Audits and Financing** — Provide consumers with decision-quality information and financing options to enable uptake of energy efficiency and heat pumps.
- **Innovations/Demonstration of Building Electrification Solutions** — Demonstrate heat pump technologies (and other carbon-reducing solutions) in large commercial/multifamily buildings — working with portfolio property owners to define technical needs and performance specs, engaging manufactures to deliver/tailor products to meet NY building needs, and supporting cost-shared demonstration of solutions in New York. In addition, support advanced technology development in key areas related to electrification, including thermal storage.
- **Identify Innovation/R&D Needs** to achieve carbon neutral buildings.

Zero Carbon Buildings



Clean Heating & Cooling	Reduced Load	Transactive Energy	Added Value
Integrated Systems	Customizable	Business Models	Resiliency
Thermal Distribution and Storage	Advanced Manufacturing and Automation	Analytics, Data Fusion P2P	Productivity, Health and Comfort
Cold Climate Heat Pumps Renewable Thermal	Innovative Materials	Automation and Controls	Operational Efficiency
NextGen HVAC	**Building Envelope**	**Building Grid Interaction**	**Non-Energy Benefits**

Significant Potential for Energy and GHG Reductions

HVAC

25%
of total energy used in New York State

36%
of New York State GHG emissions

Economical Alternative to Building Out Generation

70%
of New York State buildings built before Energy Code

40-60%
reduction potential in thermal load

Buildings — Flexible, Value-Generating Resources

Building-to-Grid (B2G) enabling products and services

Value Stacking

Demonstration and quantification of higher-value benefits

Funding Commitments

FUNDING SOURCES

Several funding sources help NYSERDA advance the State's clean energy goals and achieve the Authority's mission. NYSERDA invests these funds in a fiscally responsible manner that maximizes benefits to New Yorkers, fills critical gaps, and addresses the needs of the market.

Clean Energy Fund
Authorized by the Public Service Commission (PSC) and derived from an assessment on retail sales of electricity by State utilities — it is comprised of four portfolios: Market Development, Innovation and Research, NY-Sun, and NY Green Bank.

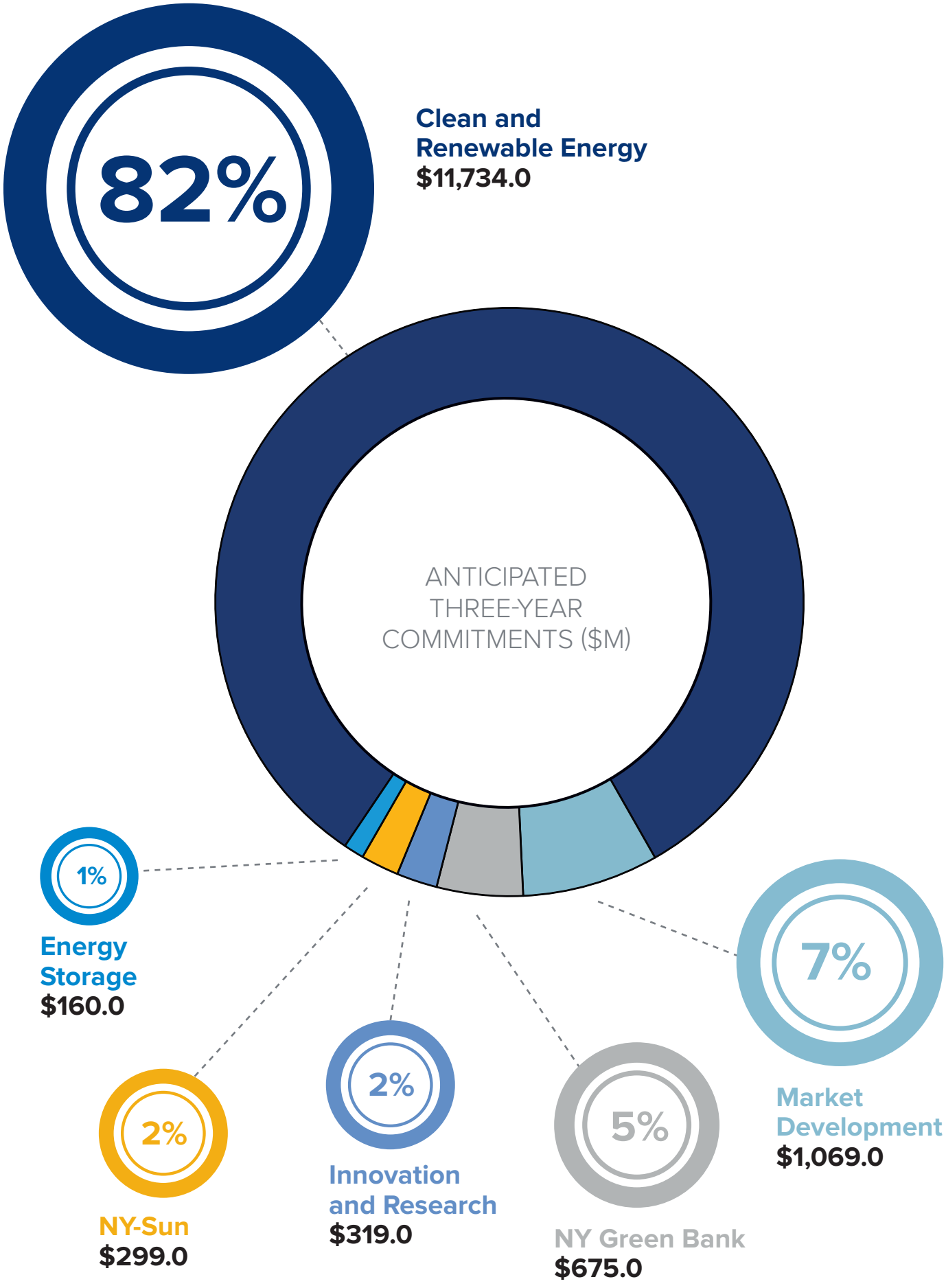
Clean Energy Standard
As authorized by the PSC, these funds are realized by NYSERDA through the sale of Tier 1 Renewable Energy Credits (RECs), Offshore Wind Renewable Energy Credits (ORECs), and Zero Emission Credits (ZECs) as well as receipt of Alternative Compliance Payments from New York's Load Serving Entities (LSEs). Through PSC orders, LSEs are obligated to meet annual compliance obligations for RECs, ORECs and ZECs. As needed, utility financial backstop collections may be called upon to meet funding shortfalls.

Regional Greenhouse Gas Initiative (RGGI)
Derived from sale of carbon emission allowances as set forth in 6 NYCRR Part 242 and 21 NYCRR Part 507. The amount of revenues available is dependent on the variable auction prices for the allowances. Per requirements in 21 NYCRR 507, RGGI funds are used to advance energy efficiency, renewable energy, and carbon abatement projects in New York State.

Other Funds
Includes sources provided by various sponsors used for specific purposes. Public funds are leveraged considerably with private sector funding through NYSERDA programs.

ANTICIPATED COMMITMENTS (APRIL 1, 2020-MARCH 31, 2023)

INVESTMENT AREAS AND PRIORITY INITIATIVES	ESTIMATED 3-YEAR INVESTMENT LEVEL	% OF TOTAL	NYSERDA MISSION OUTCOME(S) ICONS INDICATE RELEVANCE FOR PLANNED FUNDING RENEWABLES	ENERGY EFFICIENCY	EMISSIONS REDUCTIONS	CLEAN ENERGY ECONOMY	DISTRIBUTED ENERGY SYSTEM
Renewable and Clean Energy	$ 11,734,446,000	82%	✓		✓	✓	
Market Development	$ 1,068,935,000	7%		✓	✓	✓	✓
NY Green Bank	$ 675,000,000	5%	✓	✓	✓	✓	✓
Innovation and Research	$ 319,021,000	2%			✓	✓	✓
NY-Sun	$ 298,692,000	2%	✓		✓	✓	✓
Energy Storage	$ 159,894,000	1%	✓		✓	✓	✓
Total	**$ 14,255,988,000**						


82%
Clean and
Renewable Energy
$11,734.0
ANTICIPATED
THREE-YEAR
COMMITMENTS ($M)
1%
Energy
Storage
$160.0
2%
NY-Sun
$299.0
2%
Innovation
and Research
$319.0
5%
NY Green Bank
$675.0
7%
Market
Development
$1,069.0

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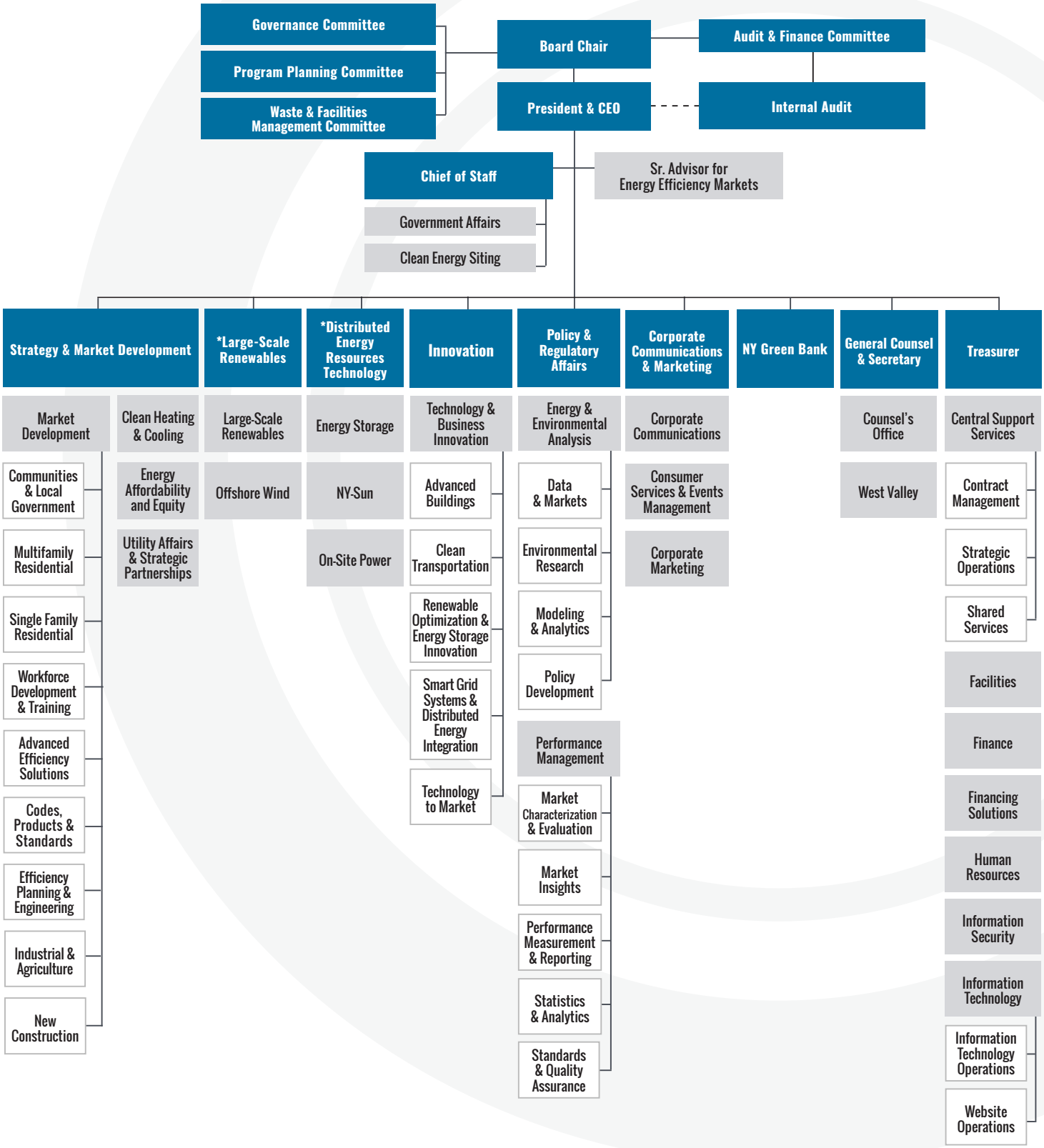
Appendix

NYSERDA'S STRUCTURE

NYSERDA is a public benefit corporation that was created in 1975 under Article 8, Title 9 of the State Public Authorities Law.

NYSERDA is governed by a board consisting of 13 members, including the commissioner of the Department of Transportation, the commissioner of the New York State Department of Environmental Conservation, the chair of the New York State Public Service Commission, and the president and CEO of the New York Power Authority, who all serve ex officio. The remaining nine members are appointed by the Governor with the advice and consent of the State 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. The board chair is designated by the Governor.



** While not shown as part of Market Development organization, these areas are included in the Clean Energy Fund Market Development Chapter.*

NYSERDA BOARD MEMBERS

Richard L. Kauffman
NYSERDA Chair

Sherburne B. Abbott
Vice President for Sustainability Initiatives and
University Professor of Sustainability Science and Policy, Syracuse University

Charles Bell
Programs Director, Consumers Union

Kenneth D. Daly
President of New York Business, National Grid

Kate Fish
Executive Director, Adirondack North Country Association

Jay L. Koh
Managing Director and Founder, Lightsmith Group

Mark A. Willis
Senior Policy Fellow, New York University, Furman Center

Gil Quiniones
President and CEO, New York Power Authority

John B. Rhodes
Chair, New York State Public Service Commission

Basil Seggos
Commissioner, New York State Department of Environmental Conservation

Marie Therese Dominguez
Commissioner, New York State Department of Transportation

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State of New York
Andrew M. Cuomo, Governor

New York State Energy Research and Development Authority
Richard L. Kauffman, Chair | Alicia Barton, President and CEO

Resolution No. ____

RESOLVED, that the outlook for the Authority's energy, economic environmental program priorities and strategic vision entitled *Toward a Clean Energy Future: A Strategic Outlook 2020-2023*, submitted to the Members for consideration at this meeting with such non-substantive, editorial changes and supplementary schedules as the President, in her discretion, may deem necessary or appropriate, is recommended to be adopted and approved by the Board as the Authority's updated Strategic Outlook.

New York State Energy Research and Development Authority

Fiscal Year 2020-21 Budget and Financial Plan

DRAFT

Table of Contents

CERTIFICATION
DRAFT

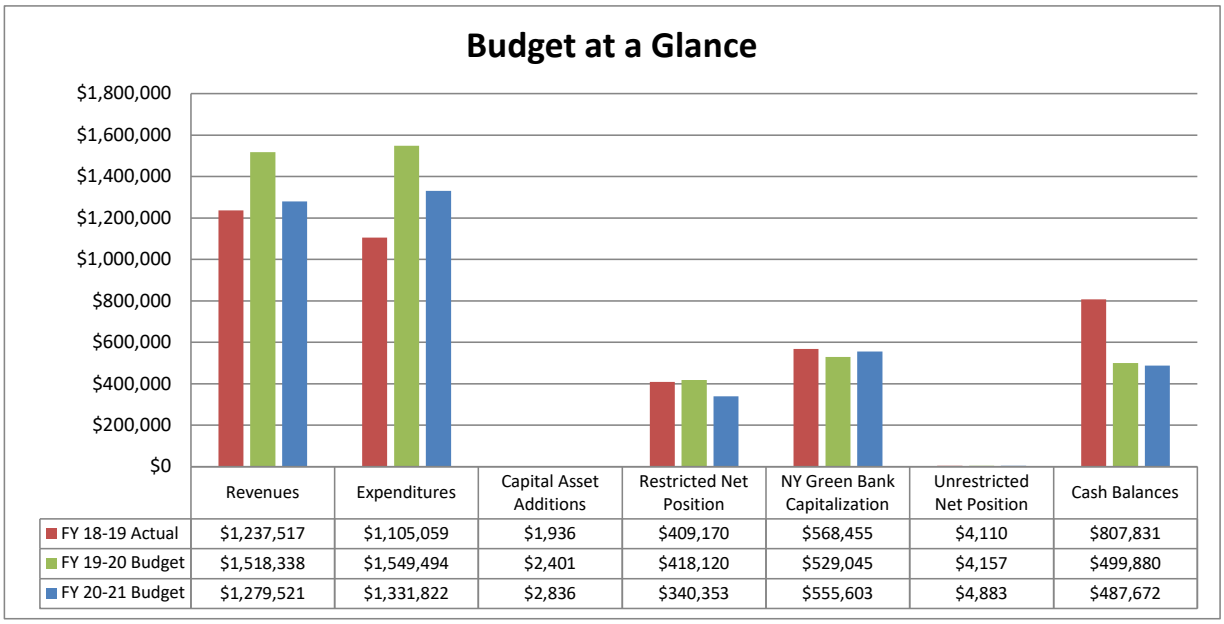
I hereby certify that, to the best of my knowledge and belief after reasonable inquiry, the budget information contained herein for the fiscal year ending March 31, 2021 has been developed based on reasonable assumptions and methods of estimation.

Alicia Barton
President and Chief Executive Officer

Jeffrey J. Pitkin
Treasurer and Chief Financial Officer

Budget FY 2020-21

(Amounts in thousands)



	Revenues	Expenditures	Capital Asset Additions	Restricted Net Position	NY Green Bank Capitalization	Unrestricted Net Position	Cash Balances
FY 18-19 Actual	$1,237,517	$1,105,059	$1,936	$409,170	$568,455	$4,110	$807,831
FY 19-20 Budget	$1,518,338	$1,549,494	$2,401	$418,120	$529,045	$4,157	$499,880
FY 20-21 Budget	$1,279,521	$1,331,822	$2,836	$340,353	$555,603	$4,883	$487,672

INTRODUCTION

The New York State Energy Research and Development Authority (NYSERDA) is a public benefit corporation established in 1975 pursuant to Title 9 of Article 8 of the Public Authorities Law of the State of New York. NYSERDA is a component unit of the State of New York and, as such, the results of operation are reported in the State of New York's Comprehensive Annual Financial Report.

The Budget for the fiscal year ending March 31, 2021 (FY 2020-21), and the Financial Plan for FY's 2021-22 to 2023-24 were prepared in accordance with accounting principles generally accepted in the United States of America.

PROGRAM SUMMARY

Following is a summary of the functions/activities included in the Budget:

Clean Energy Fund (CEF)

Pursuant to a January 2016 Order (CEF Order), the Public Service Commission (PSC) authorized a ten-year commitment through 2025 of approximately $5.322 billion to clean energy programs through a CEF. The CEF is designed to meet four primary objectives: greenhouse gas emission reductions; energy affordability; statewide penetration and scale of energy efficiency and clean energy generation; and growth in the State's clean energy economy.

The CEF Order provided for a ten-year funding authorization of $3.43 billion for the Market Development and Innovation & Research activities, and also provided for additional funding authorization of $781.5 million for the NY Green Bank, $960.6 million for NY-Sun, and $150 million for the Renewable Portfolio Standard Program for a 2016 Main Tier solicitation. The NY-Sun and NY Green Bank programs are presented as separate Programs/Functions in the budget document as further described below.

Market Development and Innovation & Research

The CEF Market Development activities are designed to reduce costs, accelerate customer demand, and increase private investment for energy efficiency and other behind-the-meter clean energy solutions through strategies including financial support, technical knowledge, data, education to customers and service providers, and advanced workforce training. The CEF Innovation & Research activities are designed to invest in cutting-edge technologies that will meet increasing demand for clean energy including: smart grid technology, renewables and distributed energy resources, high performance buildings, transportation, and clean tech startup and innovation development.

NY-Sun

Approved through a 2012 PSC Order, the NY-Sun program is designed to develop a sustainable and subsidy-free solar electric industry through a megawatt block approach. The NY-Sun program was initially funded through $216 million reallocated under the RPS program; as a result, certain expenditures for the NY-Sun program are included in the RPS program in the budget. The CEF Order established the incremental collection schedule by utilities and reallocation of NYSERDA clean energy uncommitted funds to support program activities approved through the 2012 Order

NY Green Bank

The key elements of NY Green Bank's mission are collaborating with private sector participants, implementing structures that overcome barriers and address gaps in current clean energy financing markets, and transforming those markets by enabling greater scale, new and expanded asset classes and liquidity. These factors combined have the objectives to motivate faster and more extensive implementation of clean energy assets within New York State, foster greater energy choices, reduce environmental impacts and accrue more green energy advantages per public dollar spent for the benefit of all New Yorkers.

NY Green Bank's initial capitalization was established from $315.6 million in uncommitted utility surcharge assessment funds and $52.9 million from RGGI revenues (which was subsequently redeemed to support NYSERDA's statewide energy storage initiative). As discussed above, the CEF Order authorized incremental collections for the remaining $631.5 million of NY Green Bank's capitalization.

Clean Energy Standard (CES)

Pursuant to an August 2016 and subsequent Orders, the Clean Energy Standard was established adopting a State Energy Plan goal that 50% of New York's electricity is to be generated by renewable sources by 2030, as part of a strategy to reduce statewide greenhouse gas emissions by 40% by 2030. The mandated actions are divided into two categories, a Renewable Energy Standard (RES) and a Zero-Emissions Credit (ZEC) requirement. The RES directs NYSERDA to procure renewable energy credits from renewable energy generation from qualifying facilities through competitively selected long-term contracts, and to offer such credits for periodic sale to Load Serving Entities (LSE) to meet their obligations to serve their retail customers through the procurement of a minimum percentage of qualifying renewable energy credits. The RES also includes an obligation on distribution utilities on behalf of all retail customers to continue to invest in the maintenance of existing at-risk renewable generation attributes and a program to maximize the value potential of new offshore wind resources. The ZEC requirement consists of an obligation for NYSERDA to provide payments to certain nuclear generation facilities for the production of zero-emissions attributes from such facilities, funded from monthly installment payments collected from LSEs for their proporationate share of such attributes to serve their retail customers evidenced by the procurement of qualifying zero emission credits.

Regional Greenhouse Gas Initiative (RGGI)

The Regional Greenhouse Gas Initiative, or RGGI, is an agreement among nine Northeastern and Mid-Atlantic States to reduce greenhouse gas emissions from power plants. The RGGI states (Participating States) have committed to cap and then reduce the amount of carbon dioxide that certain power plants are allowed to emit, limiting the region's total contribution to atmospheric greenhouse gas levels. The Participating States have agreed to implement RGGI through a regional cap-and-trade program whereby the Participating States have agreed to auction annual regional emissions. Rules and regulations promulgated by the NYS Department of Environmental Conservation (DEC) call for NYSERDA to administer periodic auctions for annual emissions. Pursuant to these regulations, the proceeds will be used by NYSERDA to administer energy efficiency, renewable energy, and/or innovative carbon abatement programs, and to cover the costs to administer such programs.

West Valley

NYSERDA manages, on behalf of the State, the Western New York Nuclear Service Center (West Valley), which is the site of a former plant for reprocessing used nuclear fuel. Through 1972, the former plant operator, Nuclear Fuel Services, Inc., generated as a by-product of its

reprocessing operations, more than 600,000 gallons of liquid, high-level radioactive waste, which were stored at the site. In 1980, Congress enacted the West Valley Demonstration Project Act (West Valley Act). Pursuant to the West Valley Act, the U.S. Department of Energy (DOE) is carrying out a demonstration project to: (1) solidify the liquid high-level radioactive waste at West Valley; (2) transport the solidified waste to a permanent federal repository; and (3) decontaminate and decommission the reprocessing plant and the facilities, materials, and hardware used in the project. NYSERDA and the Federal government share the combined expenses incurred for this program.

NYSERDA also maintains, on behalf of the State, the State-Licensed Disposal Area (SDA), which is a shut-down commercial low-level radioactive waste disposal facility at West Valley. NYSERDA is evaluating how to remediate and close this facility in accordance with regulatory requirements.

Energy and Environmental Analysis

Through this program, NYSERDA provides objective and credible analyses of energy issues to various stakeholders. The program also includes activities for energy-related emergency planning and response, and support for State energy planning functions.

NYSERDA is also responsible for coordination of nuclear material matters, including serving as the State liaison with the Nuclear Regulatory Commission.

These activities are primarily funded through an assessment authorized under Section 18-a of Public Service Law and a Federal State Energy Plan grant.

Pursuant to the State Low-Level Radioactive Waste (LLRW) Management Act of 1986, NYSERDA is responsible for collecting information and providing regular reports to the Governor and Legislature on LLRW generation in the State. These activities are funded with a State appropriation sub-allocated from an appropriation provided to the NYS Department of Health, which is funded through an assessment collected on operating nuclear power plant licensees.

Other

Other programs represent an aggregate of smaller programs/functions. These activities are primarily funded through Commission Orders, Memorandum of Understanding with various utilities pursuant to Commission Orders, various third-party reimbursements, federal energy grants, State appropriations and assessments authorized under Section 18-a of the Public Service Law.

BUDGETARY ASSUMPTIONS

The following are the principal budget assumptions used in developing the Budget and Financial Plan:

- The CEF Order established a “Bill-As-You-Go” approach for revenue collection effective January 1, 2016. Under this approach, incremental CEF ratepayer collections and the previously approved collections for New York Energy $mart, Technology and Market Development, and Renewable Portfolio Standard programs not yet paid to NYSERDA, will be held by the electric and gas utilities and used to reimburse NYSERDA for actual CEF program expenses and NY Green Bank committed capital through a monthly reimbursement process, provided that the reimbursement allows NYSERDA to maintain

a sufficient cash balance based on projected expenses for the subsequent two-month period, subject to the utilities' unremitted collection balances approved in the CEF Order. Utility surcharge assessments revenue is based on anticipated expenditures and NY Green Bank committed capital, prior fiscal year projected cash balances, and the resulting collections projected to maintain working capital pursuant to this approach.

- NY Green Bank loan interest and fees are based on estimates of committed and deployed capital.
- Allowance auction proceeds for the Regional Greenhouse Gas Initiative (RGGI) are based on the allowance price realized in the September 2019 auction .
- West Valley's State appropriation revenue for FY 2020-21 through FY 2023-24 is based primarily on the State's 10% share of West Valley Demonstration Project costs and the State's share under the Consent Decree. These estimates assume future U.S. Department of Energy (DOE) annual funding of approximately $75.0 million for FY 2020-21, FY 2021-22, FY 2022-23, and FY 2023-24, for its share of project costs.
- Interest income is based on assumed balances available for investment and based on a one-year U.S. Treasury bond index yield.
- GJGNY budgeted loan interest income assumes additional loans to be issued during FY 2020-21 of up to $25.0 million based on current loan origination volume.
- Salary costs for current staff and funded vacant positions expected to be filled are based on salary grades equivalent to the State Management/Confidential (M/C) employees. Salaries include a cost-of-living-adjustment in accordance with increases granted for M/C employes (2% effective April 1, 2020). Salaries also include performance-based salary increases and payments comparable to those which may be authorized for state employees.
- Fringe benefit costs are generally based on prior year actual costs as a percentage of salary costs. The OPEB expense under Governmental Accounting Standards Board Statement No. 75 in the FY 2020-21 Budget is based on preliminary actuarial estimates calculated, but the final amount to be recorded in the year of implementation of the standard may differ once a final actuarial calculation is prepated.
- The NYS Cost Recovery Fee represents the fee paid to the State under Section 2975 of the Public Authorities Law (Governmental Cost Recovery System) for general governmental services. The FY 2020-21 Budget assumes that NYSERDA's assessment will be $12.7 million, which is based on the prior year assessed value.
- The Budget includes no significant or non-recurring revenue-enhancement or cost-reduction initiatives which shift resources from one year to another.

BUDGETARY RISKS

The following is a summary of significant budgeting risks:

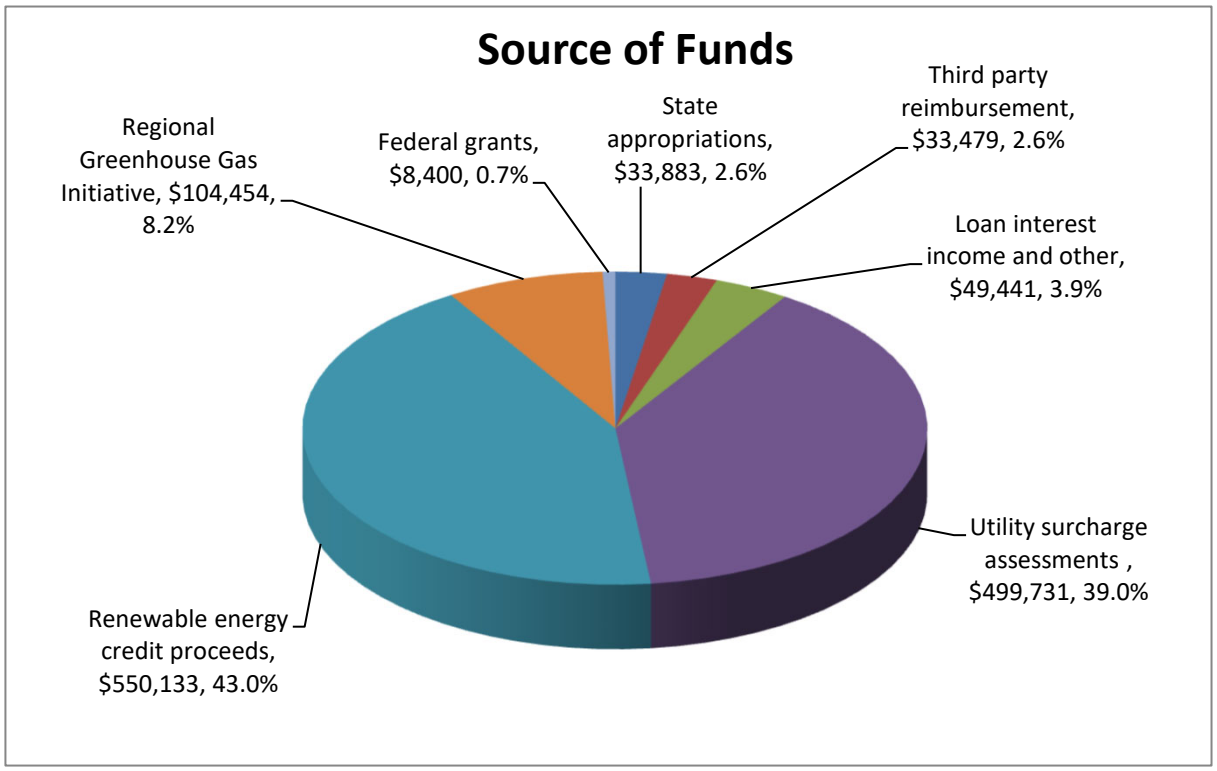
- NYSERDA's budgeting process is subject to inherent risks regarding the ability to accurately forecast revenues and expenditures.
- Over the past several years, NYSERDA has assumed responsibility for administering certain new programs, and additional program responsibilities may be added during FY 2020-21 that have not been included in the Budget.
- Revenues resulting from auctions of allowances under the Regional Greenhouse Gas Initiative (RGGI) have shown some volatility over the past few years. NYSERDA has developed a multi-year program planning approach for these revenues, but variations in actual proceeds realized makes it difficult to complete accurate long-term planning.
- Program expenditures for most programs are funded with revenues which are generally received in advance of expenditures. Under the modified accrual basis of accounting,

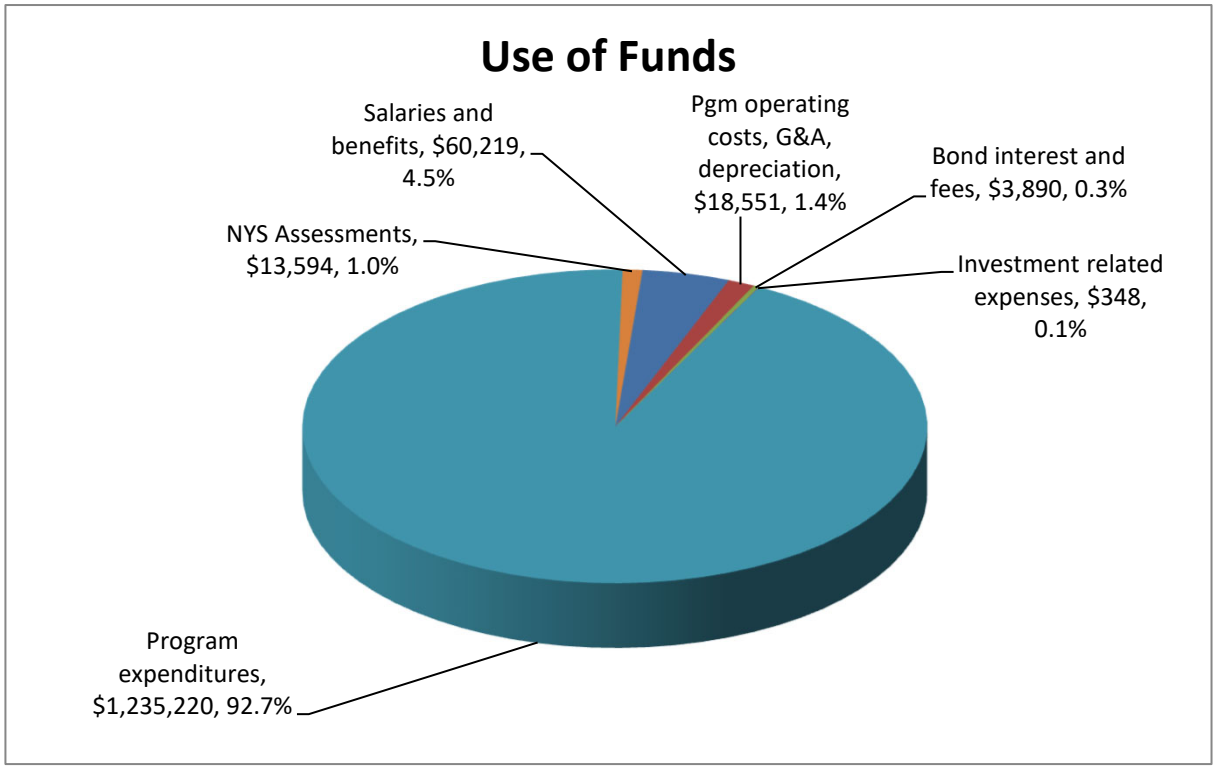
these funds are recorded as revenue when received, with any unexpended funds recorded as Restricted Net Position. Timing of program activity may result in either: (1) revenues exceeding expenses during the Budget period; or (2) expenditures funded in part, by unexpended revenues from prior fiscal periods. It is anticipated that under the CEF BAYG approach NYSERDA will see more consistency in recording revenues in the same time period that expenditures are incurred.

- Expenditures for the West Valley program are based primarily on the amount anticipated to meet the State's share of costs for West Valley under the Cooperative Agreement and the Consent Decree which are dependent upon funds provided in the federal budget to the U.S. Department of Energy (DOE).
- Although DOE and NYSERDA have reached agreement on the allocation of costs (percentages) to be paid by each entity for remediating the West Valley site, the remedial action for several significant facilities will not be finalized prior to 2022. In addition, DOE has taken the position that State will be responsible for waste disposal fees when high level waste on-site reaches an ultimate repository destination, a figure to be calculated at the time of disposal pursuant to the Nuclear Waste Policy Act, 42 U.S.C. 10101 et seq. The agreement between the parties left this issue unresolved, as no national repository option will be in place for many years. Although NYSERDA has advanced, and will continue to advance, legal arguments as to why this responsibility is not one that rightfully falls on the State, additional State funding may be required once the issue is resolved.
- Pension costs and retirement health insurance costs are based on actuarial valuations, and such valuations could be impacted by a number of assumptions, general economic conditions, and future events which could lead to variances from estimated annual expenses.

Budget FY 2020-21

(Amounts in thousands)

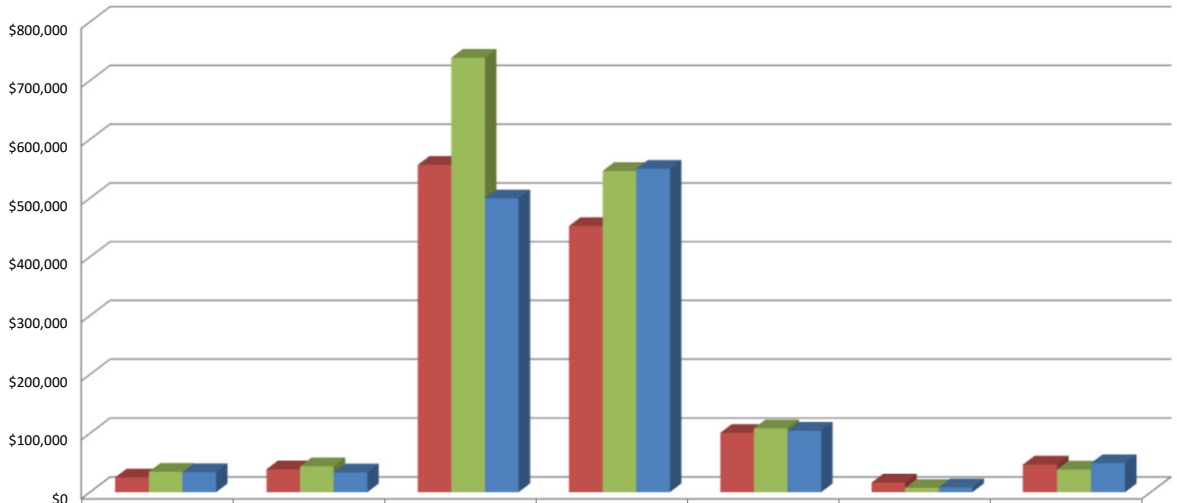




Budget FY 2020-21

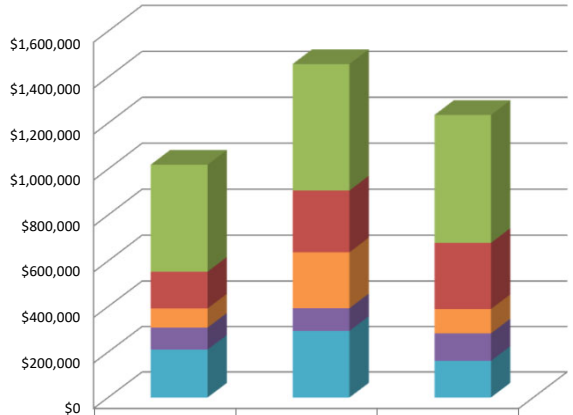
(Amounts in thousands)

Budget Comparison: Revenues



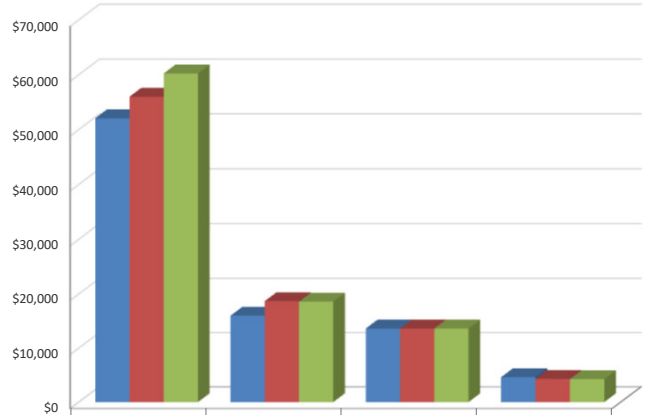
	State appropriations	Third party reimbursement	Utility surcharge assessments	Clean Energy Standard	RGGI auction proceeds	Federal grants	Loan interest income and other
FY 18-19 Actual	$25,190	$38,881	$556,603	$452,698	$100,839	$16,351	$46,955
FY 19-20 Budget	$34,573	$44,046	$739,056	$546,299	$108,598	$7,339	$38,427
FY 20-21 Budget	$33,883	$33,479	$499,731	$550,133	$104,454	$8,400	$49,441

Budget Comparison: Program Expenses



	FY 18-19 Actual	FY 19-20 Budget	FY 20-21 Budget
Clean Energy Standard	$465,802	$550,591	$556,927
Market Development / Innovation & Research	$161,499	$269,069	$289,226
NY-Sun	$83,953	$244,533	$107,017
RGGI	$97,244	$100,207	$121,156
Other	$210,369	$292,584	$160,894

Budget Comparison: Administration and Other



	Salaries and benefits	Program operating costs, G&A, depreciation	NYS Assessments	Other
FY 18-19 Actual	$52,041	$15,956	$13,593	$4,602
FY 19-20 Budget	$55,971	$18,656	$13,594	$4,289
FY 20-21 Budget	$60,219	$18,551	$13,594	$4,238

NYSERDA
Budget FY 2020-21
(Amounts in thousands)

		Budget FY 2020-21	Budget FY 2019-20
Net position beginning of year	$	967,847	997,652
Revenues:			
State appropriations		33,883	34,573
Third party reimbursement		33,479	44,046
Utility surcharge assessments		499,731	739,056
Renewable energy credit proceeds		9,096	5,262
Zero emission credit payments		541,037	541,037
Allowance auction proceeds		104,454	108,598
Project repayments		385	341
Federal grants		8,400	7,339
Rentals from leases		986	990
Interest income		11,002	6,291
Loan interest		32,016	26,792
QECB interest subsidy		355	399
Fees and other income		4,697	3,614
Total Revenues		1,279,521	1,518,338
Expenses:			
Salaries and benefits		60,219	55,971
Program expenditures		1,235,220	1,456,984
Investment related expenses		348	559
Program operating costs		4,508	4,513
General & administrative expenses		10,740	11,007
Depreciation		3,303	3,136
NYS Assessments		13,594	13,594
Bond interest and fees		3,890	3,730
Total Expenses		1,331,822	1,549,494
Net (expense) revenue and change in net position		(52,301)	(31,156)
Net position end of year:			
Restricted for specific programs		340,353	418,120
NY Green Bank Capitalization		555,603	529,045
Net Investment in Capital Assets		14,707	15,174
Unrestricted		4,883	4,157
Total net position end of year	$	915,546	966,496

NYSERDA
Budget FY 2020-21
(Amounts in thousands)

	Functions/Programs									
	Market Development / Innovation & Research	NY Green Bank	NY-Sun	Clean Energy Standard	RGGI	Energy & Environmental Analysis	West Valley	Other	**Budget FY 2020-21**	Budget FY 2019-20
Net position, beginning of year	$ 70,925	529,045	34,542	(13,400)	122,376	3,815	-	226,052	**967,847**	**997,652**
Revenues:										
State appropriations	-	-	-	-	6,169	150	18,200	9,364	**33,883**	34,573
Third party reimbursement	15,000	-	-	-	-	-	1,829	16,650	**33,479**	44,046
Utility surcharge assessments	274,826	8,578	94,859	-	-	9,951	-	111,516.95	**499,731**	739,056
Renewable energy credit proceeds	-	-	-	9,096	-	-	-	-	**9,096**	5,262
Zero emission credit payments	-	-	-	541,037	-	-	-	-	**541,037**	541,037
Allowance auction proceeds	-	-	-	-	104,454	-	-	-	**104,454**	108,598
Project repayments	-	-	-	-	-	-	-	385	**385**	341
Federal grants	-	-	-	-	-	2,581	-	5,819	**8,400**	7,339
Rentals from leases	-	-	-	-	-	-	-	986	**986**	990
Interest income	1,131	3,404	337	2,035	1,773	-	-	2,322	**11,002**	6,291
Loan interest	-	23,614	-	-	-	-	-	8,402	**32,016**	26,792
QECB interest subsidy	-	-	-	-	-	-	-	355	**355**	399
Fees and other income	-	4,500	-	-	-	-	-	197	**4,697**	3,614
Total Revenues	290,957	40,096	95,196	552,168	112,396	12,682	20,029	155,997	**1,279,521**	1,518,338
Expenses:										
Salaries and benefits	23,749	8,647	1,965	3,749	5,523	5,586	2,518	8,482	**60,219**	55,971
Program expenditures	289,226	640	107,017	556,927	121,156	4,950	16,636	138,668	**1,235,220**	1,456,984
Investment related expenses	-	348	-	-	-	-	-	-	**348**	559
Program operating costs	684	2,040	59	83	12	897	152	581	**4,508**	4,513
General & administrative expenses	4,231	1,536	349	669	985	996	458	1,516	**10,740**	11,007
Depreciation	1,835	189	320	210	121	123	61	444	**3,303**	3,136
NYS Assessments	3,298	138	1,132	5,793	1,318	130	204	1,581	**13,594**	13,594
Bond interest and fees	-	-	-	-	-	-	-	3,890	**3,890**	3,730
Total Expenses	323,023	13,538	110,842	567,431	129,115	12,682	20,029	155,162	**1,331,822**	1,549,494
Net sources / (uses) of net position other than transfers	(32,066)	26,558	(15,646)	(15,263)	(16,719)	-	-	835	**(52,301)**	(31,156)
Inter-program transfers	17,655	-	-	-	(29,655)	-	-	12,000	**-**	-
Net Investment in Capital Assets	287	-	(277)	(128)	-	-	(4)	(345)	**(467)**	(743)
Net Position End of Year:										
Restricted for specific programs	53,550	-	18,751	(28,933)	76,002	3,815	(200)	217,368	**340,353**	418,120
NY Green Bank Capitalization	-	555,603	-	-	-	-	-	-	**555,603**	529,045
Net Investment in Capital Assets	2,964	-	145	270	-	-	200	11,128	**14,707**	15,174
Unrestricted	-	-	-	-	-	-	-	4,883	**4,883**	4,157
Net position end of year	$ 56,514	555,603	18,896	(28,663)	76,002	3,815	-	233,379	**915,546**	966,496

NYSERDA
FY 2020-21 Budget
Reconciliation of Budget Changes
(Amounts in thousands)

	Actual FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21	Explanation for change
State appropriations					
RGGI	$ 3,235	5,679	490	6,169	Represents new funding provided for the 76 West initiative, offset in part by a reduction in anticipated expenditures under the RGGI Cleaner Greener Community program (repayment of the FY 13-14 transfer of $25 million to the State General Fund).
Other Programs - Energy/Environmental projects	8,208	11,044	(1,680)	9,364	Represents decreases in anticipated expenditures under the Brookhaven National Lab Energy Storage project and from a UDC Capital Budget appropriation.
Energy & Environmental Analysis - Low-Level Radioactive Waste	148	150	-	150	(No change)
West Valley	13,599	17,700	500	18,200	Reflects an increase in anticipated program expenditures for NYSERDA's share of federal and state spending at West Valley.
Total state appropriations	25,190	34,573	(690)	33,883	
Third party reimbursement	38,881	44,046	(10,567)	33,479	Reflects decreases in reimbursement funding due to timing of anticipated expenditures under the Indian Point Energy Center Reliability Contingency program and from the Volkswagen settlement with the Federal Government to help promote clean transportation initiatives.
Utility surcharge assessments					
Energy Storage	-	-	33,258	33,258	Increase reflects revenues based on anticipated expenditures under the BAYG approach for this new program authorized by the Public Service Commission in January 2019.
NY Green Bank	119,882	-	8,578	8,578	Increase is based on projections of deployed and redeemed capital as well as forecasted cash balances.
18-a funding	19,700	19,700	-	19,700	(No change)
Market Development / Innovation & Research	194,744	302,861	(28,035)	274,826	Increase reflects revenues based on anticipated expenditures under the "Bill-As-You-Go" (BAYG) approach.
EEPS/SBC/RPS	145,913	146,808	(78,298)	68,510	Decrease is primarily due the anticipated closure of the EEPS program in FY 19-20. FY 20-21 amount only reflects revenues for SBC and RPS based on anticipated expenditures under the BAYG approach.
NY-Sun	76,364	269,687	(174,828)	94,859	Decrease in revenues (under the BAYG approach) is based on lower anticipated expenditures than what was assumed in the prior year.
Total utility surcharge assessments	556,603	739,056	(239,325)	499,731	
Renewable energy credit proceeds	1,138	5,262	3,834	9,096	Reflects an anticipated increase in the number of renewable energy credits to be sold to Load Serving Entities under the Clean Energy Standard State-mandated compliance program.
Zero emission credit assessments	451,560	541,037	-	541,037	(No change)
Allowance auction proceeds	100,839	108,598	(4,144)	104,454	Reflects a decrease in both the anticipated allowance price and number of allowances to be auctioned, allowance price is based on the September 2019 auction results.
Project repayments	616	341	44	385	Reflects a slight increase based on anticipated recoupment payments.
Federal grants	16,351	7,339	1,061	8,400	Principally reflects a net increase in anticipated expenditures under NYS Department of Transportation Congestion Mitigation Air Quality grants, and an increase in the U.S. Department of Energy (DOE) Offshore Wind Consortium grant, offset in part by decreases in several DOE energy efficiency special project grants.
Rentals from leases	978	990	(4)	986	(Minor change)
Interest income	15,792	6,291	4,711	11,002	Increase is principally due to higher anticipated investment yields and from slightly higher investment balances.
Loan interest - NY Green Bank	14,865	18,741	4,873	23,614	Reflects an increase in anticipated loan activity.
Loan interest - GJGNY	7,562	8,051	351	8,402	Reflects an increase in anticipated loan activity.
QECB interest subsidy	436	399	(44)	355	Reflects a slight decrease in the IRS subsidy based on the Federal Government's published subsidy rate.
Fees and other income	6,706	3,614	1,083	4,697	Principally due to an increase in estimated NY Green Bank closings and undrawn fees.
Total Revenues:	1,237,517	1,518,338	(238,817)	1,279,521	

NYSERDA
FY 2020-21 Budget
Reconciliation of Budget Changes
(Amounts in thousands)

	Actual FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21	Explanation for change
Expenses:					
Salaries	37,638	39,487	3,281	42,768	Increase is primarily based on the addition of six positions to carry out activities under the Climate Leadership Community Protection Act and four NY Green Bank positions. Also reflects a 2% cost-of-living adjustment and performance-based salary increases/awards assuming both are approved for NYS employees.
Benefits	14,403	16,484	967	17,451	Reflects an increase in retirement health insurance benefit projections based on the most recent actuarial valuation, an increase in employment taxes generally corresponding to the increase in salary expense, offset in part by decreases in compensated leave balances and pension expense estimates based on prior year expenses.
Total salaries and benefits	52,041	55,971	4,248	60,219	
Program expenditures					
Regional Greenhouse Gas Initiative	97,244	100,207	20,949	121,156	Reflects an increase in anticipated expenditures based amounts included in the FY 20-21 RGGI Operating Plan.
Market Development / Innovation & Research	161,499	269,069	20,157	289,226	Reflects an overall increase in anticipated program activity resulting from the implementation of an increased amount of approved initiatives.
Energy & Environmental Analysis	2,706	1,500	3,450	4,950	Reflects an increase in anticipated costs to support the State Energy Plan and the Climate Leadership Community Protection Act.
Clean Energy Standard - REC	2,078	8,817	5,597	14,414	Reflects an increase in the projected purchase of renewable energy credits of on-line facilities under the Clean Energy Standard State-mandated compliance program.
West Valley	12,312	15,976	660	16,636	Reflects an increase in anticipated program expenditures for NYSERDA's share of federal and state spending at West Valley.
NY Green Bank	1,636	520	120	640	Reflects an increase in anticipated Evaluation expenditures.
Clean Energy Standard - ZEC	462,372	541,774	(586)	541,188	Represents a slight reduction in anticipated system development costs.
NY-Sun	83,953	244,533	(137,516)	107,017	Reflects a decrease in anticipated expenditures based on project completion dates and timing of incentive payments. Prior year forecast inadvertently included aggregate progress payments thereby overstating FY 19-20 expenditures. Progress toward meeting program goals are not affected by the decrease in anticipated expenditure levels.
Other Programs	195,067	274,588	(134,595)	139,993	Other represents individual funds less than 5% of the pogram expenditure total. The change represents an overall decrease in aniticpated expenditures primarily for Energy Efficiency Portfolio Standard (EEPS), Technology & Market Development (SBC4), and RPS programs. The decrease is offset in part by a slight increase in anticpated expenditues in the Energy Storage Program which was authorized by the Public Service Commission (PSC) in January 2019. The EEPS program is set to close in FY 19-20 in accordance with a PSC Order.
Total program expenditures	1,018,867	1,456,984	(221,764)	1,235,220	
Investment related expenses - NY Green Bank	456	559	(211)	348	Represents a decrease in estimated non-reimbursed program related costs to support investment portfolio transactions.
Program operating costs	2,733	4,513	(5)	4,508	Primarily reflects a decrease in NY Green Bank professional service costs, offset in part by increases in temporary services for several program departments and direct rent expense for NY Green Bank's additional office space.
General & administrative expenses	10,360	11,007	(267)	10,740	Primarily reflects a decrease in Information Technology (IT) temporary service costs, offset in part by increases in IT software, web based electronic data sharing, and system design and enhancement costs.

NYSERDA
FY 2020-21 Budget
Reconciliation of Budget Changes
(Amounts in thousands)

	Actual FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21	Explanation for change
Depreciation	2,863	3,136	167	3,303	Reflects an increase in projected depreciation resulting from existing capital assets and from planned additions for FY 20-21 (half year of expense).
NYS Assessments	13,593	13,594	-	13,594	(No change)
Bond interest and fees	4,146	3,730	160	3,890	Increase is based on fixed bond interest expense payment schedules including the addition of the 2019 Residential Solar and Energy Efficiency Financing Green Revenue Bonds.
Total Expenses:	1,105,059	1,549,494	(217,672)	1,331,822	
Net (expense) revenue and change in net position	132,458	(31,156)	(21,145)	(52,301)	
Net position beginning of year	868,086	997,652	(29,805)	967,847	
Cumulative effect of change in accounting principle (GASB 75)	(2,892)	-	-	-	
Net position end of year:					
Restricted for specific programs	409,170	418,120	(77,767)	340,353	Anticipated effect of BAYG pursuant to the CEF Order.
NY Green Bank Capitalization	568,455	529,045	26,558	555,603	Reflects the net effect of anticipated capital calls, deployed capital, matured/recycled capital, and a cumulative result of revenues exceeding expenditures.
Net Investment in Capital Assets	15,917	15,174	(467)	14,707	Reflects anticipated asset purchases less depreciation.
Unrestricted	4,110	4,157	726	4,883	Primarily due to an increase in investment earnings as a result of the pooling of investments in the Multifunding Source Cash Management money market fund.
Total net position end of year	$ 997,652	966,496	(50,950)	915,546	

Certain amounts for FY 2018-19 and FY 2019-20 have been reclassified to conform with the FY 2020-21 Budget presentation.

NYSERDA FY 20-21 Budget
Detail schedule: Salaries and benefits
(Amounts in thousands)

	Actual FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21
Salaries **	37,638	39,487	3,281	42,768
Fringe Benefits:				
Postemployment health insurance (GASB 45/75)	2,071	2,026	683	2,709
Social Security/Medicare taxes	2,711	2,667	427	3,094
Voluntary Defined Contribution Plan	701	1,001	71	1,072
NYS Paid Family Leave	29	37	31	68
Health insurance	4,339	4,552	26	4,578
Workers compensation	68	75	10	85
Dependent Care plan	17	17	3	20
Dental plan	302	273	64	337
Long-term disability insurance	83	90	-	90
Unemployment	30	36	(2)	34
Tuition reimbursement	30	45	(10)	35
Vision care plan	29	51	(17)	34
Compensated absence leave accruals	408	622	(149)	473
Pension	3,585	4,992	(170)	4,822
sub-total benefits	14,403	16,484	967	17,451
Percentage of Salaries	38.3%	41.7%		40.8%
Total Salaries and Benefits	52,041	55,971	4,248	60,219
Number of full-time equivalent employees (FTEs)	339.6	351.5	10.7	362.2

** FY 2020-21 Salaries include a 2% cost of living adjustment increase effective April 1, 2020 for NYS Management/Confidential employees. Salaries also include performance-based salary increases and payments generally equivalent to salary increases and total salary costs anticipated to be provided for NYS employees.

NYSERDA FY20-21 Budget
Detail schedule: Program Expenditures
(Amounts in thousands)

Function/Program		Working Budget *	Budget FY 2019-20	Budget FY 2020-21	Financial Plan FY 2021-22	Financial Plan FY 2022-23	Financial Plan FY 2023-24	Future
Market Development/ Innovation & Research	$	2,587,675	269,069	289,226	435,912	431,021	406,595	755,852
NY Green Bank		2,715	520	640	415	640	500	-
NY-Sun		828,046	244,533	107,017	107,017	104,767	84,033	180,679
Clean Energy Standard - Offshore Wind		5,922,192	-	1,325	-	-	-	5,920,867
Clean Energy Standard - REC		3,679,209	8,817	14,414	55,740	144,386	189,277	3,266,575
Clean Energy Standard - ZEC		2,865,087	541,774	541,188	590,473	590,473	186,650	414,529
RGGI		412,686	100,207	121,156	74,657	47,962	17,252	51,452
Energy & Environmental Analysis		19,700	1,500	4,950	4,950	4,150	4,150	-
West Valley		82,059	15,976	16,636	16,595	16,512	16,340	-
Other Programs		846,602	274,588	138,668	171,237	131,588	82,887	47,634
Total	$	17,245,970	1,456,984	1,235,220	1,456,996	1,471,499	987,684	10,637,588

* Working Budget represents approved sponsor funding or amounts anticipated to be approved for future year activity

Certain amounts for FY 2019-20 have been reclassified to conform with the FY 2020-21 Budget presentation.

NYSERDA FY 20-21 Budget
Detail schedule: Program Operating Costs
(Amounts in thousands)

	Actuals FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21
Temporary Staffing, Outside Technical Reviewer	420	478	378	856
Rent, Maintenance & Repairs, Utilities, Insurance	318	366	312	678
Office Supplies, Equipment Rental, and Other	191	235	56	291
Travel and Outreach Costs	435	587	7	594
Training, Recruitment & Relocation	13	56	6	62
Computer Services and Software	226	380	(44)	336
Professional Services:				
STEP & Other Consulting	414	95	(60)	35
NY Green Bank	716	2,316	(660)	1,656
Total Professional Services	1,130	2,411	(720)	1,691
Total Program Operating Costs	2,733	4,513	(5)	4,508

NYSERDA FY 20-21 Budget
Detail schedule: General & Administrative Expenses
(Amounts in thousands)

	Actuals FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21
Computer Services and Software	1,461	1,629	389	2,018
Professional Services:				
Website support services	205	267	113	380
Fiscal Agent, audit and third-party payroll and Human Resource services	528	510	32	542
Other Consulting	180	63	3	66
Information security	114	-	-	-
Internal Audit support services	65	50	-	50
Marketing	392	280	-	280
Communication and consumer support services	119	175	(25)	150
Total Professional Services	1,603	1,345	123	1,468
Systems Design and Enhancement	483	356	100	456
Rent, Maintenance & Repairs, Utilities, Insurance	2,577	2,820	92	2,912
Office Supplies, Equipment Rental, and Other	154	215	60	275
Training, Recruitment & Relocation	118	298	7	305
Travel and Outreach Costs	249	268	(21)	247
Temporary Staffing, Outside Technical Reviewer	3,715	4,076	(1,017)	3,059
Total General & Administrative Expense	10,360	11,007	(267)	10,740

Certain amounts for FY 2018-19 and FY 2019-20 have been reclassified to conform with the FY 2020-21 Budget presentation.

NYSERDA FY 20-21 Budget
Detail schedule: Capital Budget
(Amounts in thousands)

	Actual FY 2018-19	Budget FY 2019-20	Change	Budget FY 2020-21
Clean Energy Fund system development costs	1,405	1,000	600	1,600
Building improvements	-	626	95	721
Vehicles	-	-	40	40
Clean Energy Standard system development costs	242	-	-	-
Leasehold improvements	46	-	-	-
STEP infrastructure	10	30	-	30
Furniture, fixtures and equipment	106	75	(75)	-
Information technology upgrades	127	670	(225)	445
Total Capital Asset Additions	1,936	2,401	435	2,836

NYSERDA FY 20-21 Budget
Detail schedule: Debt Schedule
(Amounts in thousands)

Purpose: Refinancing of loans issued through the Green Jobs-Green New York finacing program

	Principal Issued	Cumulative Debt Service	Pledged Revenues	Debt service % of Pledged Revenues	FY 20-21 Debt Service	FY 20-21 Outstanding Principal	FY 21-22 Debt Service	FY 21-22 Outstanding Principal	FY 22-23 Debt Service	FY 22-23 Outstanding Principal	FY 23-24 Debt Service	FY 23-24 Outstanding Principal
Residential Energy Efficiency Financing Revenue Bonds												
Series 2013A (NYS EFC Guarantee)	23,400	29,651	37,436	79.2%	2,206	10,660	2,133	8,880	1,892	7,290	1697	5,845
Series 2015A	46,358	54,363	67,991	80.0%	3,975	30,430	3,738	27,310	3,660	24,210	3657	21,050
Series 2016A	23,180	24,539	34,473	71.2%	2,028	17,330	2,017	15,695	1,859	14,190	1785	12,730
Residential Solar Loan Revenue Bonds, Series 2015A	48,536	75,406	86,927	86.7%	4,312	35,549	4,153	32,618	4,123	29,568	-	-
Residential Solar Loan Revenue Bonds, Series 2018A	18,500	22,673	30,732	73.8%	2,640	12,150	2,203	10,405	1,933	8,875	1744	7,480
Residential Solar Loan Revenue Bonds, Series 2019A	15,510	18,339	21,257	0.0%	2,662	12,595	2,389	10,645	2,157	8,860	1,984	7,185
Total	175,484	224,971	278,816	80.7%	17,823	118,714	16,633	105,553	15,624	92,993	10,867	54,290

Proposed New Debt *

* No new debt issues are included in the Budget and Financial Plan as additional debt issues will require approval by the NYSERDA Board and the Public Authorities Control Board.

NYSERDA
Budget FY 2020-21
Financial Plan

(Amounts in thousands)	FY 2020-21 Budget	FY 2021-22 Projection	FY 2022-23 Projection	FY 2023-24 Projection
REVENUES:				
State appropriations	$ 33,883	23,394	25,583	23,356
Third party reimbursement	33,479	40,329	29,684	12,340
Utility surcharge assessments	499,731	828,317	741,468	634,105
Renewable energy credit proceeds	9,096	30,367	131,858	181,969
Zero emission credit payments	541,037	590,473	590,473	186,650
Allowance auction proceeds	104,454	109,140	104,558	104,558
Federal grants	8,400	10,074	9,552	6,735
Other income	49,441	53,883	62,130	66,707
TOTAL REVENUES	1,279,521	1,685,977	1,695,306	1,216,420
EXPENSES:				
Salaries and benefits	60,219	62,544	64,421	66,353
Program expenditures	1,235,220	1,456,996	1,471,499	987,684
Investment related expenses	348	355	363	370
Program operating costs	4,508	4,559	4,668	4,810
General & administrative expenses	10,740	10,077	10,381	10,693
Depreciation	3,303	3,274	2,635	2,149
NYS assessments	13,594	13,594	13,594	13,594
Bond interest and fees	3,890	3,472	3,064	2,652
TOTAL EXPENSES	1,331,822	1,554,871	1,570,625	1,088,305
Net (expense) revenue and change in net position	(52,301)	131,106	124,681	128,115
Net position beginning of year	967,847	915,546	1,046,652	1,171,333
Total net position end of year	$ 915,546	1,046,652	1,171,333	1,299,448

NYSERDA
FY 2020-21 Cash-Based Budget
(Amounts in thousands)

	Functions/Programs								
	Market Development / Innovation & Research	NY Green Bank	NY-Sun	Clean Energy Standard	RGGI	Energy & Environmental Analysis	West Valley	Other	**Total**
RECEIPTS:									
State appropriations	$ -	-	-	-	6,169	150	18,200	9,364	33,883
Third party reimbursement	15,000	-	-	-	-	-	1,829	16,650	33,479
Utility surcharge assessments	274,826	8,578	94,859	-	-	9,951	-	111,517	499,731
Renewable energy credit proceeds	-	-	-	9,096	-	-	-	-	9,096
Zero emission credit payments	-	-	-	541,037	-	-	-	-	541,037
Allowance auction proceeds	-	-	-	-	104,454	-	-	-	104,454
Project repayments	-	-	-	-	-	-	-	385	385
Federal grants	-	-	-	-	-	2,581	-	5,819	8,400
Rentals from leases	-	-	-	-	-	-	-	986	986
Interest income	1,131	3,404	337	2,035	1,773	-	-	2,322	11,002
Loan interest	-	23,614	-	-	-	-	-	8,402	32,016
Loan principal repayments	-	107,389	-	-	-	-	-	-	107,389
QECB interest subsidy	-	-	-	-	-	-	-	355	355
Fees and other income	-	4,500	-	-	-	-	-	197	4,697
TOTAL REVENUES	290,957	147,485	95,196	552,168	112,396	12,682	20,029	155,997	1,386,910
DISBURSEMENTS:									
Salaries and benefits	23,749	8,647	1,965	3,749	5,523	5,586	2,518	8,482	60,219
Program expenditures	289,226	640	107,017	556,927	121,156	4,950	16,636	138,668	1,235,220
Investment related expenses	-	348	-	-	-	-	-	-	348
Other Operating costs	684	2,040	59	83	12	897	152	581	4,508
General & administrative expenses	4,231	1,536	349	669	985	996	458	1,516	10,740
Capital asset additions	2,076	173	39	75	111	112	50	200	2,836
Deployed Capital	-	226,407	-	-	-	-	-	-	226,407
Bond interest and fees	-	-	-	-	-	-	-	3,890	3,890
Principal bond payment	-	-	-	-	-	-	-	13,933	13,933
Loan purchases	-	-	-	-	-	-	-	24,982	24,982
NYS Assessments	3,298	138	1,132	5,793	1,318	130	204	1,581	13,594
TOTAL EXPENSES	323,264	239,929	110,561	567,296	129,105	12,671	20,018	193,833	1,596,677
Net (expense) revenue and change in cash position	(32,307)	(92,444)	(15,365)	(15,128)	(16,709)	11	11	(37,836)	(209,767)
Cash and investments, beginning of year	79,693	205,604	44,318	125,361	139,069	4,084	-	99,310	697,439
Inter-program transfers	17,655	-	-	-	(29,655)	-	-	12,000	-
Cash and investments, end of year	$ 65,041	113,160	28,953	110,233	92,705	4,095	11	73,474	487,672

Resolution No. _____

RESOLVED, that the proposed fiscal year 2020-21 Budget and Financial Plan submitted to the Members for consideration at this meeting, with such non-material, editorial changes and supplementary schedules as the President and Chief Executive Officer, in her discretion, may deem necessary or appropriate, be and it hereby is recommended for approval by the Board for submission to the persons designated in Sections 1867(4) and 2801 of the Public Authorities Law.