

Toward a Clean Energy Future:

A Strategic Outlook

2023

THROUGH



NYSERDA

2026

FROM THE PRESIDENT AND CEO



Now more than ever (and maybe for the first time), we have a fighting chance in the battle to avert the worst impacts of climate change and secure a clean, livable future.

To our colleagues, partners, and fellow New Yorkers:

As 2023 arrives, a new chapter is unfolding in the transition to a clean energy economy. 2022 was a banner year for climate policy from the landmark federal Inflation Reduction Act to New York State's finalization of the Climate Action Council Scoping Plan; the proverbial stars are aligning for climate action. With this comes the chance to bring together government, families, businesses, industry and utilities in a common effort. Now more than ever (and maybe for the first time), we have a fighting chance in the battle to avert the worst impacts of climate change and secure a clean, livable future.

Meanwhile, our society has entered the "mid-transition"—the onset of a new era where the conventional, fossil-based energy system must coexist with a growing renewable and zero-emission energy system, bringing with it novel challenges and new iterations of old problems. Simultaneously, of course, we must deal with the pressing threat of a rapidly changing climate, which itself brings impacts on infrastructure and energy delivery in unexpected and sometimes paradoxical ways. And as always, these factors intermingle with the ever-unpredictable geopolitics of energy and supply chains.

What that means is that the energy transition cannot be uncoupled from the realities of our modern world. We need to decarbonize while we ensure reliability during record-setting winter storms. We need to reduce emissions as we provide sufficient energy supply in the wake of the global energy crisis brought on by the war in Ukraine. And we need to build clean infrastructure at a time when inflation and unstable supply chains run roughshod over core commodities required to run our economy. Nobody said it would be easy; nobody said it would be this hard.

Despite the "all at once" challenges associated with mid-transition, we must also celebrate the fact that we have unprecedented opportunities to do something about it and to benefit from this transition at the same time. Thanks to Governor Kathy Hochul's leadership, here at NYSERDA and across New York State government, we have the will, the means, the wherewithal, and the plan to get it done. In the past few months alone, we've seen major new developments and milestones reached. To name just a few:

- **Scoping Plan adopted and approved:** In December 2022, by a vote of 19–3, the Climate Action Council (co-chaired by NYSERDA and the Department of Environmental Conservation (DEC)) adopted and approved a groundbreaking Scoping Plan—450+ pages filled with recommendations from the State's top experts for attaining the State's Climate Act goals. Important improvements to the draft plan were made to take account of new developments in 2022, but the headline remains the same: acting on climate will cost far less than inaction, and it will deliver immense net benefits to the residents, businesses, and communities of New York through a cleaner energy system, reduced pollution, healthier buildings and neighborhoods, significant new job creation, and so much more. I'm extremely proud to have cast an enthusiastic "aye" vote in favor of the Scoping Plan, and I could not be more excited to begin the critical work of bringing its recommendations to life.

- **Executive Order 22 issued:** In September 2022, Governor Hochul issued a comprehensive executive order to coordinate sustainability and resilience investments and drive progress across State operations. A prime example of leading by example and leveraging the State’s own purchasing power and standard-setting influence, Executive Order 22 laid out a suite of commitments that will guide state agency decision-making, procurement, and investments to reinforce the Climate Act’s impact state-wide (i.e., beyond just state government). In some cases, these new commitments even supersede the already ambitious requirements of the Climate Act, such as the directive to achieve 100% renewable electricity for state electric consumption by 2030. This is leading by doing.
- **State of the State 2023 unveiled:** Earlier this month, Governor Hochul unveiled her second State of the State agenda, which included not only major announcements in categories like building decarbonization and energy affordability, but also key new initiatives in other sectors and for the economy at-large. Specifically, in perhaps the centerpiece of this year’s climate and energy agenda, Governor Hochul announced her intent to move forward with a new, ambitious Cap-and-Invest program for New York’s entire economy. This slate of commitments and actions will drive the momentum forward for our State’s climate action in the years ahead. NYSERDA is fortunate to have helped craft and shape—and now to implement—this nation-leading agenda.
- **Emissions regulations rulemaking initiated:** Following the Scoping Plan’s adoption and Governor Hochul’s direction in the State of the State, NYSERDA will partner with DEC to commence rulemaking activities to design and implement an economywide Cap-and-Invest program. This programmatic activity, combined with broader DEC regulatory actions required under the Climate Act by the end of the year, will ensure that the State can attain a 40% reduction in emissions by 2030 and an 85% reduction by 2050.

With all this in mind, I’m very pleased to present NYSERDA’s updated Strategic Outlook for 2023–2026, which seeks to capture our global and local momentum and strive for expanded impact in all our activities—all while keeping everyday New Yorkers at the heart of our work. Our five core mission outcomes (Greenhouse Gas Reductions, Renewable Energy, Energy Efficiency and Building Decarbonization, Clean Energy Economy, and Resilient and Distributed Energy System) still undergird all our work. And, after conducting refreshed, deep-dive examinations of our strategic focus areas, these crucial priorities also continue to ring true. In these pages you will find updates and refinements to the four strategic focus areas that will continue to guide the lion’s share of our activities in the years ahead:

- Building an inclusive clean energy economy
- Supporting clean energy jobs
- Accelerating the transition from fossil natural gas to a low-carbon future
- Fostering healthy and resilient communities

These areas reflect activities already underway at NYSERDA, but which the Scoping Plan identifies must grow in prominence and impact. Through our leadership on these critical priorities, NYSERDA continues to drive economic opportunity built from the State’s unprecedented clean energy, carbon reduction, and climate equity targets. Despite the long-term nature of many of these goals and the realities of mid-transition, the imperative of climate change requires us to remain laser-focused on near-term action.

I am beyond proud to work at NYSERDA and serve the people of New York State every day. Thanks to the excellence of our teams across the Authority, the opportunities for us to create a better future for our State will only continue to grow. I hope our partners and stakeholders find this Strategic Outlook valuable, and we look forward to partnering with you in 2023 and beyond.

Sincerely,



Doreen M. Harris, President and CEO, NYSERDA

This forward-looking document reflects State policy and NYSERDA’s plans as of January 2023. 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: nyserdera.ny.gov/Strategic-Outlook.

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NYSERDA and Its Context



NYSERDA'S EVOLVING CHARGE

In recent years, NYSERDA has updated its mission and vision statements to better incorporate themes of climate change, equity and inclusivity, jobs and economic opportunity, public health, and resilient communities—all of which remain central to our mission and vision going forward.

As we look out to 2023 and beyond, these themes continue to resonate strongly throughout all our work and focus areas. Indeed, just as these mission and vision statements continue to ring true, so too do the strategic focus areas captured in this and last year's Strategic Outlook.

These topics—an inclusive clean energy economy, supporting clean energy jobs, accelerating the transition from fossil natural gas, and fostering healthy and resilient communities—will unfold over many years and will require our constant and dedicated focus, working in concert with partners across State agencies, local communities, neighboring states, the federal government, private industry and stakeholders.

NYSERDA'S MISSION AND VISION STATEMENTS GUIDE THE ORGANIZATION'S CURRENT AND FUTURE INITIATIVES.

Our Vision:

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

Our Mission:

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

Our Promise:

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

STATE POLICIES AND COMMITMENTS THAT STEER NYSERDA'S WORK

Under the Climate Leadership and Community Protection Act (Climate Act), Governor Kathy Hochul is driving the most aggressive climate and clean energy agenda in the nation. The agenda sets New York State on a path for a just and equitable transition to carbon neutrality, spurring the growth of the green economy while prioritizing the needs of Disadvantaged Communities across the State. New York State—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 head on, while creating economic opportunities and delivering benefits equitably.



As co-chair of New York's Climate Action Council (CAC), NYSERDA plays a critical role in charting the direction of New York State's energy and climate policies and implementing this ambitious agenda.

RESILIENT and DISTRIBUTED GRID
1,500 MW of energy storage

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

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

RESILIENT and DISTRIBUTED GRID
6,000 MW of energy storage

ENERGY EFFICIENCY and BUILDING DECARBONIZATION
1 million electric homes and 1 million electrification-ready homes

CLEAN TRANSPORTATION
100% light duty zero-emission vehicle sales

CLEAN ELECTRICITY
100% zero-emission electricity

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

now

CLEAN ENERGY ECONOMY
over 165,000 clean energy jobs

by 2025

RENEWABLE ENERGY
6,000 MW of distributed solar

by 2030

RENEWABLE ENERGY CLEAN ENERGY STANDARD
70% electricity from renewable energy

CLEAN ENERGY ECONOMY
More than 200,000 new jobs added

RENEWABLE ENERGY
10,000 MW of distributed solar

by 2035

RENEWABLE ENERGY
9,000 MW of offshore wind

by 2040

by 2050

NYSERDA'S ROLE

As New York State's clean energy and climate innovation agency, NYSERDA plays a key role in implementing the State's nation-leading policies, programs, planning, and actions, all to deliver a cleaner, healthier, and more prosperous future for all New Yorkers.

NYSERDA is on the front lines of a global energy transition. We bring energy expertise and public service to the challenges of fighting climate change and accelerating the arrival of a green energy future across all corners of our State and our economy.

NYSERDA works to foster the adoption of clean energy technologies and the innovations needed to fight climate change and to improve our quality of life. This work helps families and businesses access clean energy, energy efficiency, all-electric homes and vehicles, and measures for resilience. At the same time, NYSERDA encourages the competition and innovation that delivers value to consumers. NYSERDA uses a data-driven, engagement-focused approach to guide program design and provide for high levels of accountability and transparency, stewarding public funds toward prudent investments in a wide variety of green infrastructure. NYSERDA focuses on:

- Enabling communities, residents, and businesses to take local action on clean energy, climate, and resilience.
- Instilling confidence in markets and consumers through information, credible analysis, and education.
- Leveraging program investments to support job creation in the clean energy economy and expanded access to economic opportunities for underserved populations and other Disadvantaged Communities.
- Providing targeted financial support where costs present a persistent barrier, such as for low- to moderate-income (LMI) consumers and residents of Disadvantaged Communities.
- Increasing customers' access to capital by creating attractive precedents and standardizing approaches that capital providers can readily replicate and scale up.
- Reducing hard and soft costs of clean energy development by driving demand and focusing the efforts of key stakeholders, as well as by supporting and focusing technological and process innovation.
- De-risking energy transitions and deployment from technological and business model innovation, to demonstration projects, to broad commercialization.
- Designing and administering novel programs and pilots to meet the needs of emerging policy priorities and deep decarbonization pathways.
- Proactively driving efforts to attract clean energy economic development, manufacturing, and supply chain growth, and helping other high-tech industries achieve robust sustainability commitments.
- Investigating and designing ambitious energy and climate strategies and policies for the long-term.

In a dynamic world filled with constantly changing external conditions, NYSERDA aims to be a beacon of certainty and reliability for stakeholders and partners in New York State, exhibiting the steadfast and focused attention that will be needed to combat the climate crisis in the decades ahead.

Despite the ongoing challenges posed by a global pandemic, inflation, rising interest rates, supply chain disruptions, workforce shortages, and international conflict, NYSERDA continues to leverage its programs within the flourishing clean energy market in order to drive the State's progress toward its ambitious long-term climate mandates—aided by significant new investments at the federal level.

POLICY FRAMEWORK

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

- Finalization of New York's Climate Act Scoping Plan. In 2019, the nation-leading Climate Act was passed and dramatically raised the bar. The newly-approved Scoping Plan sets in motion the process of regulatory action to deliver the Climate Act goals.
- Continued central focus on key priority areas stemming from the Climate Act:
 - ▶ Increasing access to (and benefits from) clean energy for residents of Disadvantaged Communities and low-income consumers.
 - ▶ Creating and maintaining quality jobs in the green economy and ensuring a just transition for all New York workers as we transition to a carbon-neutral economy.
 - ▶ Designing new policies and programs to make inroads in sectors of the economy that require deeper decarbonization (e.g., transportation, buildings, waste, HFCs).
- New State legislation enacted and signed into law spurring energy efficiency, consumer savings, emissions reductions, and high-quality job creation. The legislation is coupled with the issuance of Executive Order 22, which drives sustainability and resilience in State operations; and with the passage of the Environmental Bond Act, which received notable levels of public support.

Better Buildings and Jobs Package, 2022

In July 2022, Governor Hochul signed a package of legislation to strengthen New York State's building codes and appliance standards (A.10439/S.9405), expand community/utility thermal energy networks (A.10493/S.9422), and extend prevailing wage requirements for renewable energy projects one MW and larger (A.9598/S.8648).

These bills will help the State drive real savings for consumers and building owners (\$19+ billion by 2035); advance community thermal systems that reduce fossil fuel usage for heating and cooling through community-scale infrastructure solutions; and add employment opportunities for both existing and new energy workers.

- Bold new State directives from Governor Hochul to advance an economy-wide Cap-and-Invest program for emissions reductions, as announced in the 2023 State of the State address. This program, which will include both regulatory and legislative components, will establish a gradually declining cap on greenhouse gas emissions, limit financial impact to New Yorkers, invest the proceeds in programs that drive emission reductions in an equitable manner, and maintain the competitiveness of New York's industries.
- New State proposals and directives from Governor Hochul to advance clean and resilient buildings, as announced in the 2023 State of the State address—including zero-emission new construction, ending fossil fuel heating equipment replacement, and scoring large buildings' energy consumption with letter grades.
- Action at the local level ranging from implementation of New York City's Climate Mobilization Act, adoption of voluntary stretch codes in numerous localities, and Ithaca's bold plans for a fully carbon neutral community.
 - ▶ New York City's new construction law phases fossil fuels out of new buildings starting in 2024.
- Historic new actions and investments at the federal level, which will require unprecedented coordination between the State and federal government to focus investments for maximal impact (see page 12).
- Enactment of major legislation requiring the phaseout of internal combustion vehicle sales by 2035, as signed by Governor Hochul, and accompanying regulatory action for zero-emission cars and trucks.
- Following last year's major developments in support of the "70% renewable by 2030" Clean Energy Standard (CES), 2022 saw more major renewable electricity milestones reached, including the approval and groundbreaking of two Tier 4 transmission projects, the approval of a new distributed solar goal, the filing of a roadmap for a new "6 GW by 2030" energy storage target, and more.

- Transmission planning to enable renewable development necessary to meet Climate Act goals, including the New York Independent System Operator’s (NYISO) evaluation of the Long Island Public Policy Transmission Need; the Public Service Commission’s (PSC) consideration of Phase 1, Areas of Concern, and offshore-wind-related transmission projects submitted by utilities; and the utilities’ development of a revised Coordinated Grid Planning Process (CGPP) in collaboration with the Department of Public Service (DPS), NYSERDA, and other stakeholders.
- Increased attention to mapping the transition from fossil natural gas to clean energy in light of both long-term Climate Act requirements and updated methodologies for inventorying New York State’s greenhouse gas emissions footprint.
- The ongoing efforts to align NYSERDA and utility roles for market enablement and program delivery to accelerate building efficiency and electrification, including most notably through the New Efficiency: New York and Clean Energy Review process that was launched in 2022.
- The need to build on recent policy developments to make deep in-roads in reducing emissions from transportation, which—alongside buildings—is the largest contributor of emissions in the State.
 - ▶ Public Service Commission EV Make Ready Order
 - ▶ Multi-state Medium- and Heavy-Duty Vehicles MOU
 - ▶ Adoption of Advanced Clean Trucks and Advanced Clean Cars II regulations
 - ▶ CAC Final Scoping Plan policies on transportation
 - ▶ Federal clean transportation funding
- Extreme weather events, which are increasing in frequency and severity and placing rapidly increasing strain on our infrastructure and communities, and which necessitates placing resiliency at the heart of clean energy and climate solutions.

These new and evolving drivers of change build upon ongoing challenges and priorities that must continue as core areas of focus.

- The need to ensure energy affordability for all New Yorkers as the energy system undergoes transformation.
- The importance of leveraging market activity and private capital to achieve aggressive policy goals.
- The imperative to continue building public support for complex systemic changes such as expanding support for large-scale projects and changing of everyday consumer behaviors and purchasing decisions.

As this critical inflection point for our climate and energy systems unfolds, NYSERDA will continue to align policy and program offerings to reflect these new and significant drivers of change, including prioritization of the key strategies and policies outlined in the sections of this Outlook.

Climate Leadership and Community Protection Act | (Climate Act)

Lays the groundwork for achievement of New York State’s nation-leading climate targets, while calling for an orderly and just transition to clean energy that creates jobs and continues growing a green economy. A minimum of 35%—with a goal of 40%—of benefits of clean energy investments will benefit Disadvantaged Communities.

This year—2023—marks a major milestone in the implementation of the Climate Act, as the Climate Action Council’s Scoping Plan was deliberated, discussed, finalized, and approved at the end of last year. With that Plan now final, it will be another truly formative year. The trajectory of New York State’s energy and climate journey under the Climate Act is now laid out, setting the stage for regulatory action to unfold and for agencies to begin the work of implementing the numerous recommendations approved by the Council.

New York’s Scoping Plan

Read the **Executive Summary** and the **Full Plan**, which is also available by section, at climate.ny.gov/scoping-plan

Under the Climate Act, the Climate Justice Working Group will finalize a definition/criterion of Disadvantaged Communities, which will guide the delivery of benefits of investments to these communities. Finalization is expected in the first half of 2023, setting the stage for agencies to continue orienting their clean energy investment portfolios around the imperative of benefits to Disadvantaged Communities.

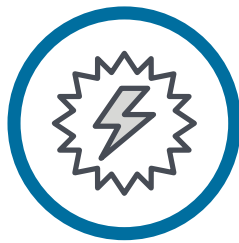
BUILDING BLOCKS OF NEW YORK'S CLEAN ENERGY AGENDA



Transportation



Buildings



Electricity



Economy Wide



Regional



Climate Act Scoping Plan

Creating policies and recommendations to achieve 40% GHG reduction by 2030 and 85% GHG reduction by 2050



Clean Energy Fund

Designating more than \$7.7 billion to fund four key program portfolios:

- > NY Green Bank
- > Market Development
- > Innovation & Research
- > NY-Sun



Clean Energy Standard



Transforming the generation of electricity to 70% renewable by 2030 and 100% zero-emission by 2040



Zero-Emission Vehicles (ZEV) Action

Reducing transportation emissions through build-out of electric vehicle market and infrastructure, support for electrification of fleets and trucks



New Efficiency: New York

Delivering energy efficiency savings and emissions reductions with comprehensive building strategies



NYS Clean Heat

Replacing onsite fuel combustion for heating and cooling with efficient, electric heat pumps (air, ground)



Regional Greenhouse Gas Initiative (RGGI)



Growing cooperative effort among northeast/mid-Atlantic states to cap and reduce CO₂ emissions from power plants



Cap-and-Invest Program

New economy-wide program to drive emissions reductions, invest proceeds in an equitable manner, provide rebates to consumers, and maintain competitiveness of New York's industries

FEDERAL INFRASTRUCTURE AND CLIMATE INVESTMENTS: PRIORITIES FOR NYSERDA AND NEW YORK


In 2021 and 2022, the federal government passed a trio of laws—the Infrastructure Investment and Jobs Act (IIJA), the CHIPS and Science Act, and the Inflation Reduction Act (IRA)—that collectively approved the largest amount of federal funding and policies to directly address climate and energy issues in our nation’s history. In combination, these transformational acts will:

- Increase domestic manufacturing capabilities for critical clean energy products
- Create family-sustaining jobs
- Lower energy costs for families
- Modernize and improve the health, comfort, and resiliency of our country’s aging homes and building stock
- Provide clean public transportation and fast charging networks across the State
- Focus investments in Disadvantaged Communities and to populations that have been historically underserved
- Reduce emissions and pollution
- Invest in innovation to drive future economic growth and job creation

With the historic passage of New York’s Climate Action Council Scoping Plan, federal funding will be an important component to New York’s achievement of its climate and clean energy goals. In particular, the passage of the robust tax credits across technologies and sectors of the economy will unlock significant private funding to invest in new technologies. More than half of the funding approved in the Inflation Reduction Act to support climate and energy work was authorized in the form of tax credits. Altogether, the passage of the Inflation Reduction Act promises to reduce the costs to New York to meeting the requirements of the Climate Act by up to \$70 billion through 2050.

The Inflation Reduction Act reforms energy tax incentives through a mix of extensions, modifications, and new programs over the next ten years


Selected tax credit modifications in the Inflation Reduction Act*



\$2,000

per year consumer tax credit for the purchase of heat pumps, heat pump hot water heaters, biomass stoves, and boilers


(25C, nonbusiness energy property credit)



\$30


per MWh for zero carbon electricity generation placed into service after 2024: reduces to \$23 in 2034 and \$15 in 2035

(45D, production tax credit; 45Y, clean electricity)



**Adders/
Bonuses**


for prevailing wage, domestic content, energy communities, low income, and more



\$7,500

per vehicle consumer tax credit for qualifying electric vehicles (EVs)


(30D, clean vehicle credit)



30%

tax credit for standalone energy storage systems

*(48A, investment tax credit)***



\$3

per kilogram for the production of qualified clean hydrogen

(45V, clean hydrogen tax credit)

* Source: www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it

Federal funding coming to New York State will be provided by several federal agencies and administered by many state agencies. Interagency partnership and collaboration will be critical to the effective use of funds.

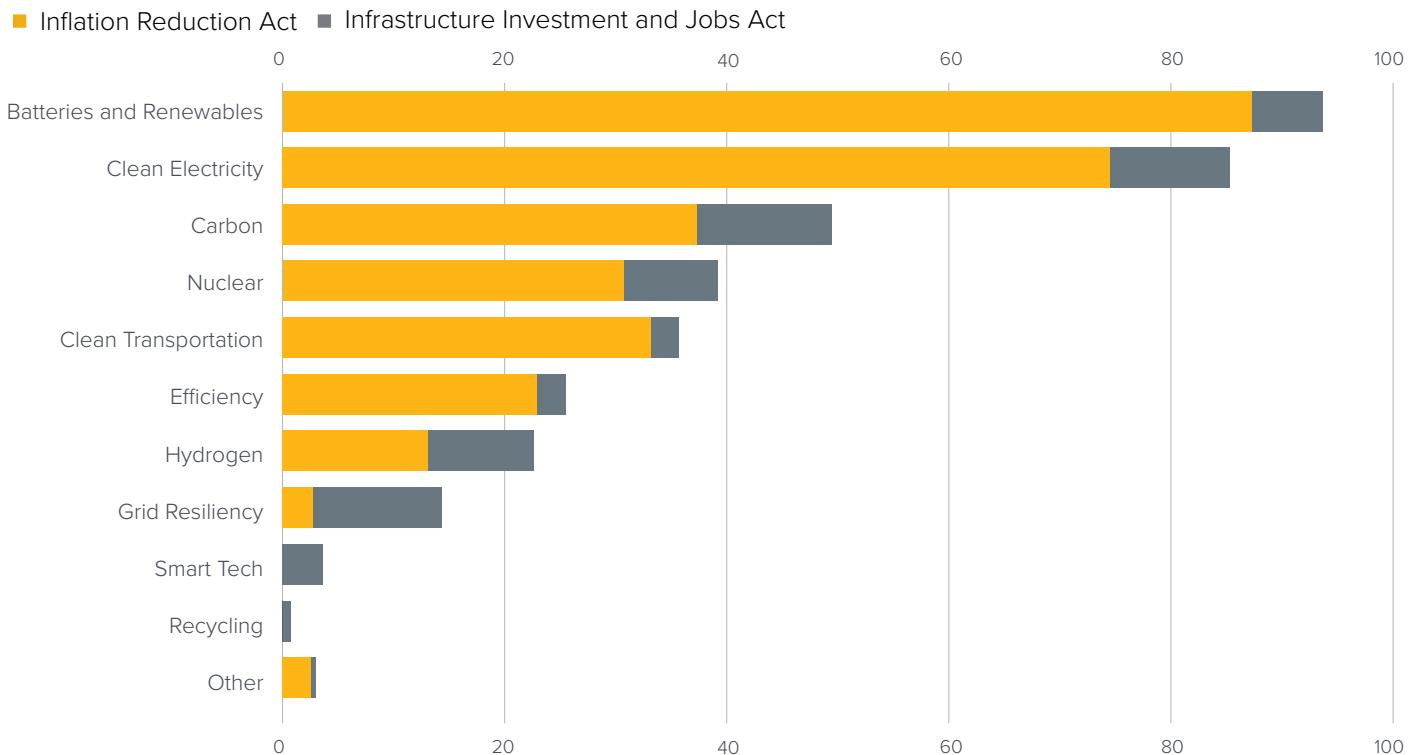
Several programs to highlight the federal investments in clean energy and this collaboration include:

- **Home Owner Managing Energy Savings (HOMES) and High-Efficiency Electric Home Rebate (HEEHR) programs:** New York will receive \$317 million in formula grants to support energy efficiency and electrification of homes, with a focus on lower income housing and housing located in Disadvantaged Communities. These two transformative programs are expected to launch by the Department of Energy in 2023.
- **Weatherization Assistance Program (WAP):** \$290 million announced (to date) supporting critical energy efficiency improvements in affordable housing.
- **National Electric Vehicle Infrastructure program:** \$175 million investment over the next five years to develop and implement a robust fast charging network across New York State.
- **Climate infrastructure resiliency grants:** \$233 million awarded to New York State, to date.

Energy funding from the Infrastructure Investment and Jobs Act and the Inflation Reduction Act spans major funding themes, totaling \$370 billion. This federal funding will address all sectors of the economy, providing important support for New York State’s national-leading Scoping Plan. Funding allocations by technology are shown in Figure 1.

NYSERDA has organized itself to track and respond to federal funding opportunities to ensure that New York State, local governments, individuals, businesses, Disadvantaged Communities, and other stakeholders can realize the maximum benefits from these investments to achieve our climate and energy goals.

FIGURE 1. ENERGY FUNDING BY THEME AND SOURCE (\$ BILLION)



Source for graphic: www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it

Mission Outcomes and Strategic Focus Areas for 2023–2026

The following sections present NYSERDA's primary mission outcomes. Each outcome shows NYSERDA's strategies over the planning horizon as well as a summary of NYSERDA's unique role in delivering on the outcome. Indicators of progress are included to track movement in the market and to show progress toward goals.

NYSERDA works to advance the following mission outcomes in support of New York State's energy transition:



**GREENHOUSE GAS
EMISSIONS REDUCTION**



**RENEWABLE
ENERGY**



**ENERGY EFFICIENCY AND
BUILDING DECARBONIZATION**



**CLEAN ENERGY
ECONOMY**



**RESILIENT AND DISTRIBUTED
ENERGY SYSTEM**

Over the planning horizon, NYSERDA will also continue to concentrate on the following strategic focus areas to drive progress under each mission outcomes and the requirements of the Climate Act. These strategies are critical to achieving New York State’s long-term energy, greenhouse gas emission reduction, and socio-economic goals:



**BUILDING AN
INCLUSIVE CLEAN
ENERGY ECONOMY**



**SUPPORTING CLEAN
ENERGY JOBS**



**ACCELERATING THE
TRANSITION FROM
FOSSIL NATURAL GAS
TO A LOW-CARBON
FUTURE**



**FOSTERING HEALTHY
AND RESILIENT
COMMUNITIES**

For each of these strategic focus areas, statewide priorities are presented along with key NYSERDA actions for 2023–2026. As characterized last year:

These strategic focus areas center on people—the residents and communities across New York State who utilize the energy system every day and have the potential to benefit from NYSERDA’s programs and policies.

These strategies will be crucial for achieving our ambitious and necessary climate objectives. Critical focus will be on helping historically marginalized New Yorkers access the growing green energy economy and clean energy job opportunities; supporting families to learn about and choose cleaner home appliances; and empowering neighbors, communities, and businesses to drive climate action and public health wins.

Many efforts will begin producing tangible outcomes in the near term, while others represent an acceleration in focus for a transition that will take many decades to unfold.



Greenhouse Gas Emissions Reduction

STATE POLICY GOAL
FOR GREENHOUSE GAS (GHG) EMISSIONS REDUCTION

The Climate Act sets annual greenhouse gas emission limits at 40% lower than 1990 levels by 2030 and 85% by 2050, and sets a carbon neutrality goal by 2050.

Achieving these limits will enable the State to advance economy-wide carbon neutrality. It will mean that New York State is doing its part to reduce GHG emissions that cause climate change, while establishing a model for other jurisdictions to follow. The Climate Act also set in motion a process to develop an updated GHG accounting methodology, which the Department of Environmental Conservation (DEC) has implemented. Due to these methodological changes—accounting for the upstream emissions associated with New York’s fossil fuel use and using a 20-year global warming potential for all emissions—achieving a 40% reduction in GHG emissions by 2030 and 85% by 2050 has become significantly more difficult, requiring swifter, more transformative changes to our energy systems and economy.

December 2022: New York State’s Climate Action Council approved and adopted a Final Scoping Plan that charts the course to the State’s ambitious 2030 and 2050 goals.

January 2023: Governor Hochul announced an economy-wide Cap-and-Invest program, directing DEC and NYSERDA to begin program design and implementation according to principles of affordability, climate leadership, creating jobs and preserving competitiveness, investing in Disadvantaged Communities, and funding a sustainable future.



2020–2021 Climate Action Council and Advisory Panel work



December 30 2021 Draft Scoping Plan issued (Economy-Wide)



Throughout 2022 Public engagement hearings and stakeholder input



December 19 2022 Final Scoping Plan released* (Economy-Wide)

Throughout 2023 Climate Act-required emissions regulations

2030 40% reduction in annual GHG emissions, relative to 1990 levels

2050 85% reduction in annual GHG emissions, relative to 1990 levels

* View the Final Scoping Plan at climate.ny.gov/Scoping-Plan



NYSERDA'S ROLE

As Climate Action Council Co-Chair, **help implement the roadmap of policies and recommendations** to achieve the Climate Act's goals under the Scoping Plan.

Guide and facilitate State Energy Plan development and shape energy policies throughout New York State, by catalyzing market transformation and through development and implementation of mandates and Executive Orders.

Identify and implement strategies for energy, buildings, and transportation sector emissions reductions and other GHG mitigation strategies.

Support development of statewide GHG inventory, supporting DEC in updated emissions methodology rulemaking and implementation.

Facilitate State agencies' efforts to lead by example and drive toward operations with reduced or eliminated emissions.

INDICATORS OF PROGRESS

- Levels and trends in GHG emissions and emissions intensity from sources statewide and within priority sectors

STRATEGIES FOR 2023–2026

- Support policy development and planning, which includes finalizing and implementing the Two Million Climate-Friendly Homes Action Plan with the Building Electrification Roadmap, ZEV Market Development Plan, 6-GW Energy Storage Roadmap, a second (updated) Offshore Wind Master Plan, Hydrogen Roadmap, and more.
- Coordinate investment of federal climate and clean energy funds made available under the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, Inflation Reduction Act, and other federal funding in partnership with other New York State agencies and authorities to maximize equitable deployment of low-emission technologies and optimally leverage other funding sources to reduce costs to ratepayers.
- “What can I do, what should I do?”— Develop communications strategies that support individual and local understanding of the Scoping Plan and translate the plan to facilitate individual action.
- Advance solutions to drive emissions reductions in all areas of New York's economy—through a foundation of energy efficiency, clean electricity supply, and beneficial electrification of buildings, transportation, and industrial applications, and other zero-emission solutions.
- Spur development of innovative, next-generation solutions driving emissions reductions in hard-to-reach sectors and hard-to-electrify applications, from hardware, software, and materials to natural carbon solutions.
- Refocus efforts to market segments needing attention, such as medium- and heavy-duty vehicles and non-road engines, as the market-based movement towards light-duty electric vehicles continues to grow. Collaborate with other public entities, including work with DPS to expand the EV make-ready program for trucks and with New York State Department of Transportation (DOT) to support the buildout of fast charging stations along New York State's major travel corridors.
- Help spearhead regional GHG program reviews alongside other states, including, notably, the periodic RGGI program review that began in Fall 2021 and is expected to conclude early 2023.
- Support communities across the State in implementing their own sustainability and clean energy goals, including local clean heating and cooling campaigns, and widespread adoption of new stretch energy/building codes.
- Work in close partnership with other agencies and authorities including DPS, Department of Environmental Conservation (DEC), DOT, Homes and Community Renewal (HCR), New York Power Authority (NYPA), Long Island Power Authority (LIPA), and others; and provide support with data, analysis, policy options development and evaluation, lead-by-example exemplars, strategic planning, and budgetary engagement.



- Conduct analyses and program development to better spotlight and target the co-benefits of GHG reductions, especially the public health benefits that can be delivered to Disadvantaged Communities via reduction in co-pollutant emissions, as seen in the Clean Energy Standard Tier 4 petition/filing.
- Support schools in implementing legislation requiring that, by 2027, all new school bus purchases will be zero-emissions, and by 2035, all school buses on the road will be zero-emissions, including developing a School Bus Electrification Roadmap.

TRANSFORMATION 2030

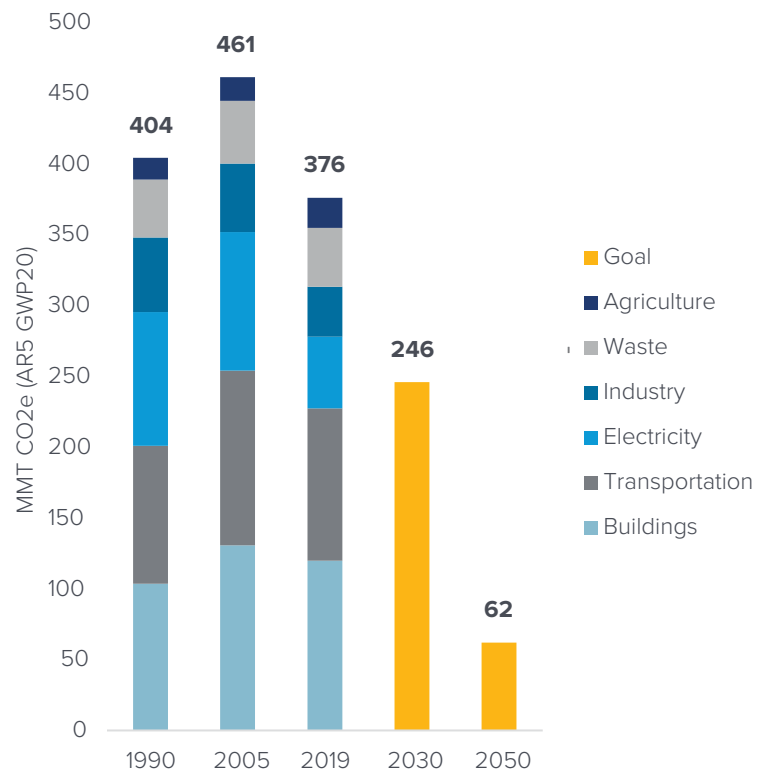
2030 target:
40% reduction
in annual emission
 relative to 1990 emissions baseline

Today, we are in the middle of a transformation that will lead to New York State looking radically different. It will be a “40% less GHG emitting society” only seven years from now.

- 20,000 MW of new power generation fueled by wind, water, and sun will account for at least 70% of the State’s electricity needs, with commensurate reductions in power and emissions from fossil fuel generators.
- Service improvements will make public transit viable for even more New Yorkers and the auto industry will be well on its way to a new era of electrified transportation, with EVs comprising over 90% of new car sales in 2030.
- Home energy efficiency upgrades have made modern and efficient heat pumps the preferred option for customers, with two million out of New York’s eight million homes having already switched or ready for the switch.
- Businesses across the State will be embracing environmental, social, and governance goals and showing that sustainability can be aligned with their bottom line.
- This transformation will have driven a thriving clean energy industry with nearly a half a million people employed in the sector and improved local air quality for all New Yorkers.

2050 target:
85% reduction
 Relative to 1990 emissions baseline

NOTE: all emissions inventory numbers were updated at the end of 2021 following DEC rulemaking on emissions accounting methodology to align with the Climate Act. The new inventory numbers put New York’s baseline of emissions at roughly 70% higher than pre-Climate Act accounting, due to the changes in accounting for upstream emissions, global warming potential, and other updates to more properly gauge the near-term impact of our emissions.



Due to methodological updates included in DEC’s GHG Emissions Report, the 1990 baseline differs slightly from the 1990 baseline incorporated into DEC’s Statewide Greenhouse Gas Emission Limits regulation (Part 496) that informed the establishment of the 2030 and 2050 values. The 2030 and 2050 values shown here are based on regulation, while the 1990 value shown here is based on the latest information developed for the annual GHG Emissions Report.

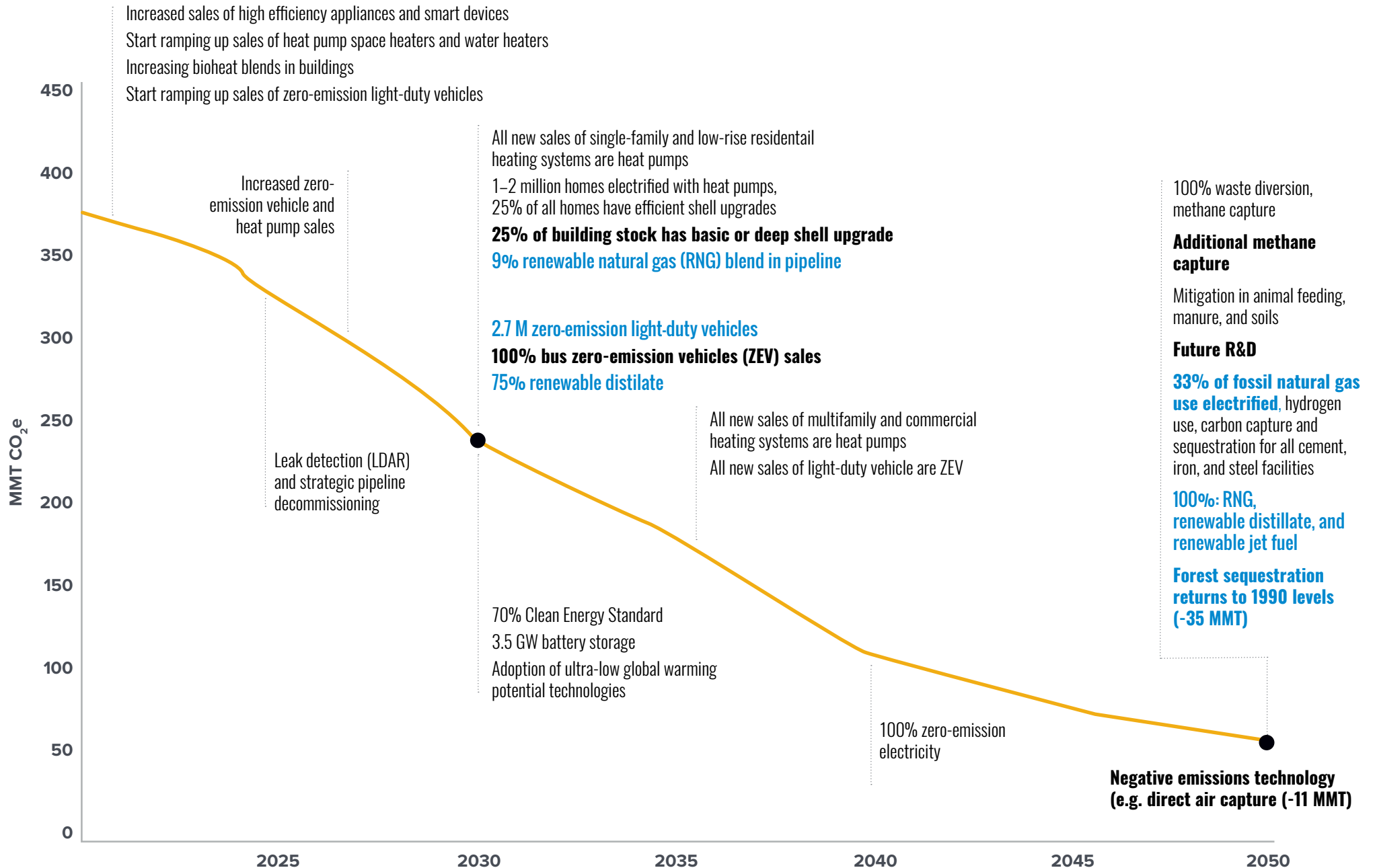


CLIMATE ACTION SNAPSHOT: NEW YORK'S SCOPING PLAN

Highlights from the 2022 Final Scoping Plan issued by the Climate Action Council in December 2022

— Climate Act Scoping Plan - Mitigation Scenario

● Climate Act gross emissions limits





HIGHLIGHTED PROGRAMS AND INITIATIVES

Clean Energy Fund accelerates the deployment of clean energy solutions in buildings (and other sectors), including towards achieving Two Million Climate Friendly Homes by 2030.

Clean Energy Standard provides the framework for achieving 70% renewable electricity by 2030 via the build-out of large-scale renewable resources for New York State. Achievement supported by complementary actions initiated in 2020 legislation (Build Ready, Office of Renewable Energy Siting [ORES], Power Grid Study), Coordinated Grid Planning Process [CGPP] and 2021 budget provisions (Prevailing Wage/Project Labor Agreements, MWBE/SDVOB requirements; Buy America preferences, renewable taxation model).

Accelerate energy innovation via a multitude of projects and initiatives including energy storage deployment, coordination of a multi-state effort to launch a new hydrogen hub, NYSERDA's tech-to-market efforts, which bring leading-edge technologies to commercialization, and more.

Energy storage deployment and other renewable energy integration measures to interconnect more renewables on the grid, minimize and avoid delivery impacts, bolster system flexibility, and support resiliency.

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

Clean Transportation Prizes and NY Truck Voucher Incentive Program represent efforts to address the air quality and quality of life impacts that the legacy transportation system have created in overburdened communities. These NYSERDA-run programs focus on community-scale transportation solutions, advanced mobility, and electric truck and bus innovation as well as rebates for the purchase of medium- and heavy-duty electric vehicles accompanied by the destruction of equivalent older, dirty diesel vehicles.

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

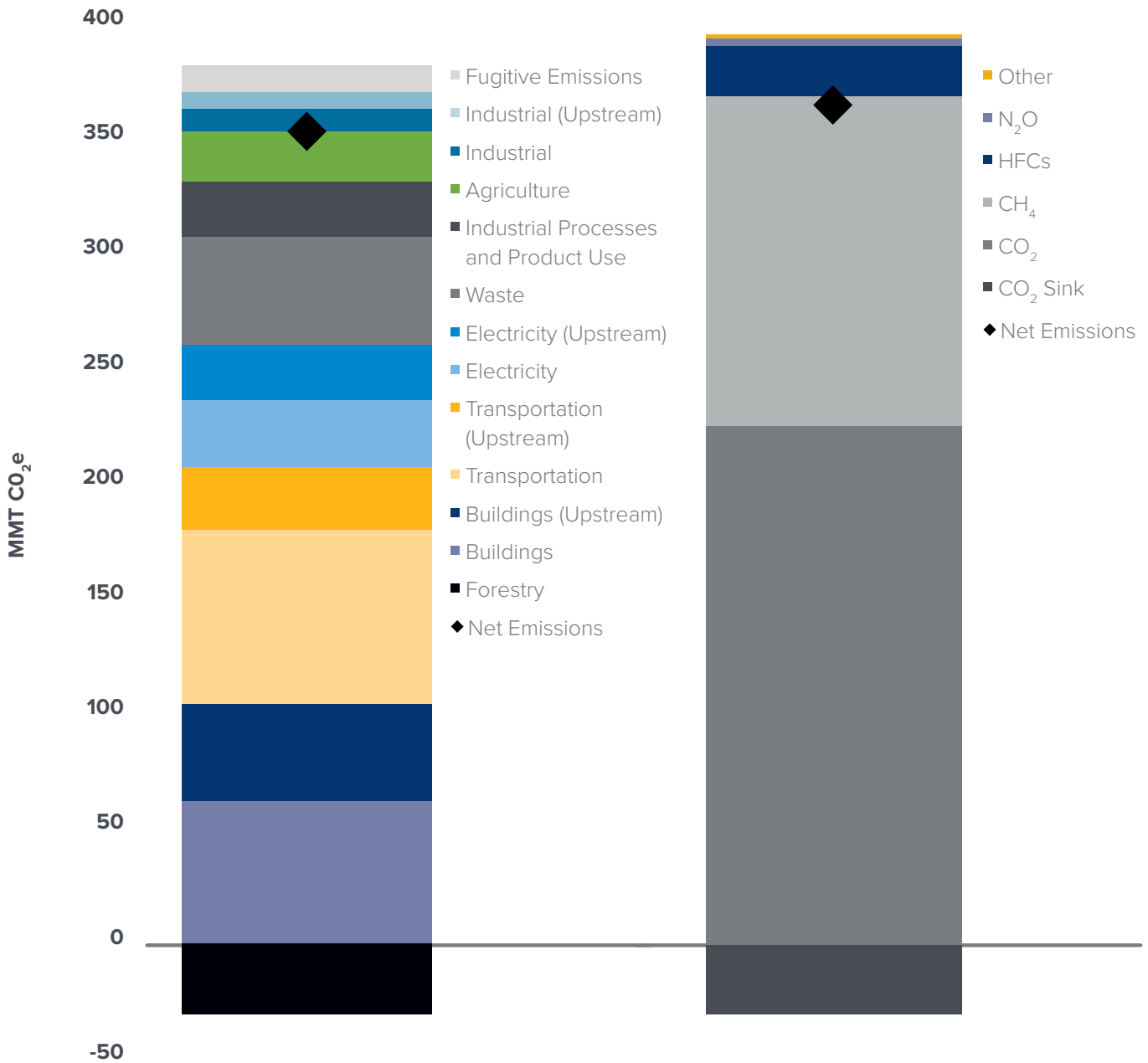
CURRENT ESTIMATED 2020 GREENHOUSE GAS EMISSIONS BY SECTOR

Draft 2020 results are in line with DEC Climate Act accounting, including upstream emission factors, 20-year Global Warming Potential (GWP), and estimates from NY PATHWAYS analysis. Sub-sector figures are not yet re-benchmarked to DEC's updated GHG Inventory Report issued December 2022.





CURRENT ESTIMATED 2020 GREENHOUSE GAS EMISSIONS BY SECTOR AND TYPE





Renewable Energy

STATE POLICY GOAL FOR RENEWABLE ENERGY

The Climate Act mandates that at least 70% of New York State’s electricity come from renewable energy sources such as wind and solar by 2030 (70x30).

Armed with climate goals among the most aggressive in the nation and with the expedited processes to match, achievement of the 70x30 mandate will move the State closer to delivering just, equitable climate action to New Yorkers, including improving air quality, buttressing a more resilient grid, and spurring a clean economy through supply chain investments, workforce development, and job creation.

The State’s nation-leading climate and energy policies and initiatives have set the stage for success in New York State, and the recent passage of historic federal investment in climate and energy work authorized as part of the Bipartisan Infrastructure Act and the Inflation Reduction Act will help New York State address some of the many challenges and risks to this groundbreaking work. This historic level of investment from the federal government will provide significant tax credits, loans, grants, and technical assistance to all sectors of the economy—including grid infrastructure and grid modeling and planning—to improve resiliency and to better integrate renewables into the safe operation of the electric grid.

In the 21st century, the future is electric. NYSERDA is working tirelessly to remove barriers and deliver our State’s goals and benefits to New Yorkers—including almost \$25 billion in net societal benefits estimated over the lifetime of Tier 1, Tier 4, and offshore wind procurements under the Clean Energy Standard.



NYSERDA'S ROLE

Facilitate continued ramp-up of steady, predictable procurements for renewable generation and energy storage, offering market confidence and supply chain stability.

Partner with local governments to support smart siting policies that maximize co-benefits between industries, cultivate infrastructure ecologies, and build community engagement.

Support climate equity through the prioritization of benefits (including energy bill savings from renewable energy) and workforce development delivered to Disadvantaged Communities across the State.

Drive supply chain localization, local port and manufacturing investments, and job creation and training, through new \$500 million State investment to support offshore wind ports and manufacturing.

Reduce costs by delivering economies of scale, removing barriers to deployment, reducing risk, and supporting innovation.

Inform transmission planning processes to drive investment critical to enabling the integration of 25+ GW of Tier 1 and offshore wind renewable projects anticipated for State goals.

INDICATORS OF PROGRESS

- MWh: progress toward the 70x30 and 100x40 targets
- MW and facilities (large-scale, offshore, behind-the-meter, and transmission) completed and in the pipeline: progress toward goals
- Benefits of renewable energy investments accruing for Disadvantaged Communities and Minority and Women-Owned Business Enterprise (M/WBE) engagement
- Private market investment, clean energy jobs, and costs per Renewable Energy Certificate (REC)

STRATEGIES FOR 2023–2026

- Accelerate efforts to achieve the Climate Act's 70x30 renewable goal. This will happen via build-out of on- and off-shore resources, and construction of the new Tier 4 transmission line projects into Zone J/New York City and associated transmission improvements needed to ensure deliverability of NY-Sun, large-scale renewables, and energy storage generation projects.
- Continue the sprint toward and reach beyond goals of 10 GW of solar by 2030, 6 GW of storage by 2030, and 9 GW of offshore wind by 2035.
- Collaborate with market participants to complete technical studies, such as New York State Cable Corridor Study; promote infrastructure investments such as transmission and energy storage that will unlock system efficiencies; and unbundle resources to drive progress on our goals and ensure cost savings to ratepayers.
- Collaborate with utilities and other market participants to build transparency in interconnection processes, overcome grid constraints on project capacity, and alleviate pricing/curtailment issues through innovative and cost-effective solutions to grid constraints. Potential solutions include the use of hybrid transmission and storage solutions and expanded integration of grid enhancing technologies, such as dynamic line ratings and power flow control devices.
- Launch a new Offshore Wind Master Plan 2.0: Deep Water. The plan will serve as an organizational framework to continue procuring offshore wind to achieve at least 9 GW of offshore wind installed by 2035, and inform approaches to maximize the benefits of further offshore development. Further development may include next-generation floating turbine technologies and the preparation for a meshed offshore network to achieve broader interregional Climate Act goals.



- Procure at least a further 2 GW of new offshore wind projects via the 2022 “NY3” RFP to support the development of a robust offshore wind supply chain and workforce and stimulate economic activity in New York State and the region.
- Expand efforts to advance energy storage in New York State through the 6 GW Energy Storage Roadmap and the PSC’s subsequent directives for next steps on energy storage programs.
- Engage in detailed sector studies of evolving resiliency design approaches and best practices to mitigate future climate risks and to deepen the carbon performance of projects through reducing embodied carbon.
- Continue supporting communities navigating reduced project development timelines under new 94-c siting process and work to improve interconnection inefficiencies.
- Work closely with communities to inform and spur adoption of smart local siting rules/laws and cultivate welcoming and cultivating adoption of renewable technologies in areas best suited to interconnect to the grid.
- Continue to engage with NYS Tax and Finance in its implementation of model renewable energy taxation law and policy.
- Engage in interregional coordination with the federal government and neighboring states to address mutual challenges and opportunities related to transmission, supply chain, benefits to Disadvantaged Communities, workforce, and environmental concerns.
- Develop a blueprint to guide the retirement and redevelopment of New York State’s oldest and most-polluting fossil facilities by 2030, working with DEC and DPS.

TRANSFORMATION 2030

- New York is well on its way to powering electricity with wind, water, and solar, with 70% renewable electricity statewide
- Virtually all large-scale resources procured by 2026/2027 to comprise 2030 portfolio
- At least 10 GW of distributed solar, roughly 16 GW of large-scale solar, approximately 4 GW of onshore wind, and at least 6 GW of offshore wind to serve expected statewide annual load
- 50,000+ new jobs created in the electricity sector (renewables, T&D, storage, etc.)
- Build-out of inter- and intra-regional transmission infrastructure, long-duration storage underway



The Climate Act and new, expanded goals ramp up renewable energy, including:

QUADRUPLING NEW YORK'S OFFSHORE WIND TARGET TO AT LEAST

9,000 MW by 2035

up from 2,400 MW by 2030

BOLSTERING DISTRIBUTED SOLAR DEPLOYMENT TO AT LEAST

10,000 MW BY 2030

up from 6,000 MW by 2025

New York State continues to grow a strong pipeline of projects to meet the 70x30 goal.

AS OF DECEMBER 2022,
THERE WERE APPROXIMATELY:

38 GW

**OF ACTIVE ONSHORE
RENEWABLE ENERGY
PROJECTS IN THE NYISO
INTERCONNECTION QUEUE**

Additionally, there are currently **MORE THAN 30 PROJECTS** in or in the process of applying for the Article 94c (ORES) queues, with 15 certificates/permits granted in 2021 and 2022—which indicates more of the pipeline is coming to fruition.

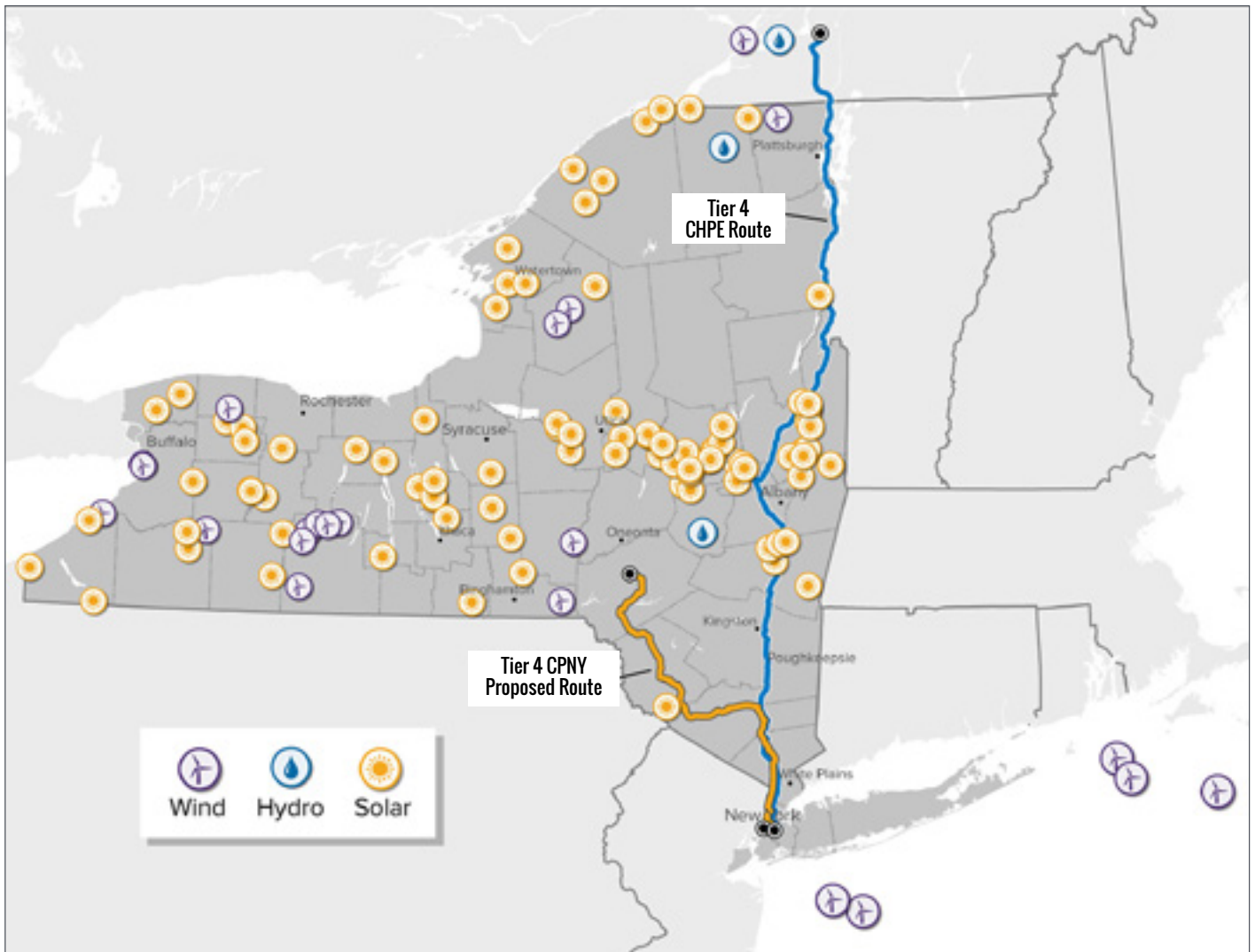
MORE THAN 1.3 GW OF ENERGY STORAGE awarded statewide, with another 200+ MW proceeding to contracting in utility procurements as of the end of 2022 and several hundred MWs expected to be built in 2023.

NINE LEASE AREAS of uncontracted offshore wind, enough to support over 14 GW of offshore generation capacity.

MORE THAN 4 GW OF DISTRIBUTED SOLAR installed statewide, with a **PIPELINE OF 3.4 GW** (high project maturity – lower than 10% attrition).



MAP OF NEW YORK CONTRACTED LARGE-SCALE RENEWABLE PROJECTS (AS OF DECEMBER 2022)



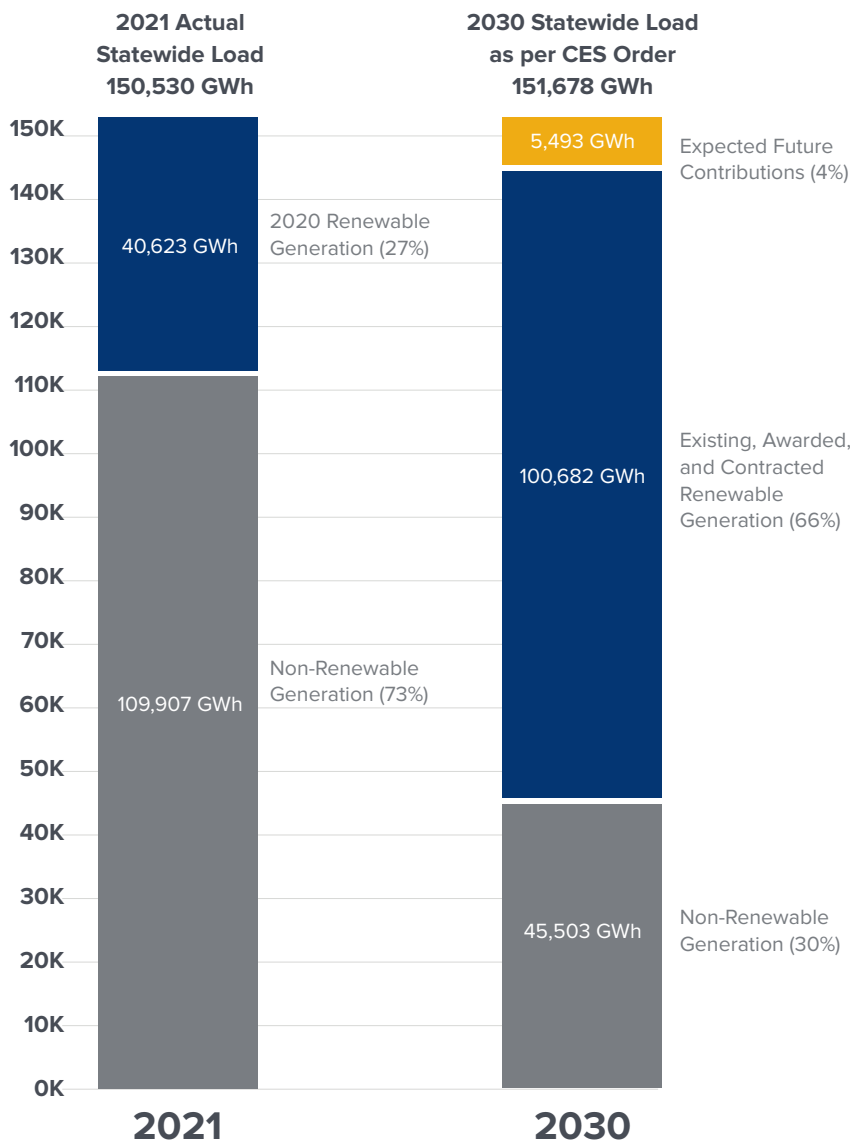


2030 Clean Energy Standard target: 70% electricity from renewable sources

PROGRESS TOWARDS 70X30 GOAL

106,175 GWh to reach goal*

** GWh required to meet goal is based on 2020 Clean Energy Standard Order load projection for 2030 and is subject to future adjustment.*



HIGHLIGHTED PROGRAMS AND INITIATIVES

Large-Scale Renewables

supports the development of large-scale renewable energy and energy storage projects.

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

Tier 4 is a new tier of the Clean Energy Standard helping bring forth new transmission and new renewables to serve New York City, via two major projects approved by the PSC in 2022.

Build-Ready complements private sector development and expedites the pre-development of large-scale renewable assets with a focus on underutilized, previously developed sites.

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 residents.

NY Sun drives distributed solar adoption through residential/commercial rooftop and larger community solar projects. These programs reduce costs and make solar accessible to all New Yorkers.

The **Energy Storage** program supports the roll-out of renewable energy generation through deployment of at least 1,500 MW of energy storage by 2025 with an expanded goal of 6,000 MW by 2030.



Energy Efficiency and Building Decarbonization

STATE POLICY GOAL FOR ENERGY EFFICIENCY AND BUILDING DECARBONIZATION

The Climate Act codifies a 2025 statewide energy efficiency target of 185 TBtu (trillion British thermal units) of cumulative end-use energy savings in New York’s buildings and industrial facilities. Governor Hochul, in her 2022 State of the State Address, called for two million climate friendly homes by 2030, across energy efficient homes and apartments that are electrified and electrification-ready.

The 2025 Climate Act energy efficiency target will deliver near-term progress toward New York State’s 40x30 climate goals, but it is only the beginning of a much more ambitious effort to modernize and decarbonize the State’s six million buildings so that they are healthier, cleaner, and more resilient.

Building energy efficiency and electrification will play a dominant role in putting the State’s building sector on a course to carbon neutrality, while creating better living and working spaces for New Yorkers, and economic opportunity in the form of clean energy jobs. Investments in energy efficiency and advances in load flexibility will minimize the grid impacts of statewide beneficial electrification of buildings. Efforts will focus on delivering benefits to Disadvantaged Communities and low- and moderate-income New Yorkers while protecting energy affordability.



Looking to the future, NYSERDA's strategy will need to go beyond building-by-building upgrades to approaches that can work block-by-block and community-by-community—such as through the deployment of clean thermal energy networks—to achieve at the scale and pace needed to address the climate crisis.

NYSERDA'S ROLE

Deliver policy and strategic leadership on energy efficiency and building electrification through the Climate Action Council, Carbon Neutral Buildings Roadmap, Building Electrification Roadmap, Two Million Climate Friendly Homes Action Plan and decarbonization partnerships with other State agencies.

Provide technical and regulatory assistance to advance codes and standards that send a clear signal to the market that New York State is phasing out the use of fossil fuel in buildings and moving to cleaner, healthier options.

Develop and manage programs to eliminate barriers and increase adoption of carbon neutral building strategies, providing financial and technical assistance to solution providers and consumers, prioritizing low- and moderate-income homes, schools and other buildings located in Disadvantaged Communities.

Support product innovation to deliver better solutions for the New York State market, lower the cost of the transition away from fossil fuels, and build a local clean energy industry.

Provide financing for energy efficiency and building electrification market participants and enable private financing of clean energy projects on a larger scale.

Help advance and implement new policy directives in the building sector, such as zero-emission new construction, fossil fuel heating equipment phaseout, and letter grades for large buildings' energy consumption—as announced by Governor Hochul in the 2023 State of the State address.

INDICATORS OF PROGRESS

- GHG emission reduction from the building sector (annual CO₂e)
- Energy savings: total TBtus across all fuels (fossil natural gas, electricity, etc.)
- Buildings that are efficient and decarbonized, as a percent of New York's six million buildings
- Prioritized investment in buildings and homes located in under-resourced and historically marginalized Disadvantaged Communities
- New York's Clean Energy Dashboard can be used to track indicators of progress, found at nyscrda.ny.gov/view-clean-energy-dashboard

STRATEGIES FOR 2023–2026

- Leverage insights from the Carbon Neutral Buildings Roadmap (published in January 2023) and the forthcoming Building Electrification Roadmap in designing market interventions to incorporate deep efficiency, more efficient electric heating and cooling technologies, and grid-connected capability.
- Advance the market for resilient, carbon neutral buildings including supporting deeper levels of efficiency using a variety of strategies such as peer-based challenges and public-private demonstration partnerships; support of long-term energy planning within the capital improvement cycle; support of health-based studies; demand aggregation, supply-side engagement, community-scale systems, the development and demonstration of new solutions to deliver higher performing buildings products and systems, and other cost reduction strategies; as well as development and demonstration of new solutions to deliver higher performing buildings products and systems.
- Advance and deepen partnerships and programs that create cleaner, healthier, and more resilient homes and buildings for low-income families and in under-resourced and historically marginalized Disadvantaged Communities, with a focus on schools and affordable housing, in coordination with housing agencies and utilities—including through HCR's new \$25 billion, five-year housing capital plan (2022–2027).
- In partnership with utilities, deliver weatherization and efficient electrification of buildings through consumer incentives and market support, including development of relevant workforce and supply chains to move New York toward all-electric buildings and accelerate the transition away from fossil fuels.



- Build market demand by increasing consumer awareness and providing timely and accurate information, tools, and playbooks on energy efficiency and building electrification opportunities for building owners and tenants—capitalizing on key points in a building life cycle (e.g., tenant turnover, major renovations, property transfer, equipment replacement).
- Support statewide building decarbonization in new construction through a combination of market demonstrations over the next three years to help assess a mandatory low energy-use-intensity and zero on-site GHG new construction code phasing in from 2025 through 2028.
- Support strategies for statewide building decarbonization in the existing building stock, such as development of appliance efficiency standards, fossil fuel heating equipment phaseout, letter grades for large buildings, home energy disclosure upon property sale, and building performance standards.
- Advance the development of clean thermal energy networks by supporting feasibility studies, detailed design studies, development of new business models, and construction funding for private developers and municipalities, as well as coordinate with DPS and utilities on the roll out of the Utility Thermal Energy Networks and Jobs Act.

TRANSFORMATION 2030

By 2030 New York State will need to have 1–2 million homes and buildings equipped with modern electric heating and cooling and paired with energy efficiency, as an essential part of achieving New York State’s climate goals. This will create better living and working spaces for New Yorkers—especially low- and moderate-income New Yorkers—and will build healthier communities. Achieving these goals calls for a skilled workforce and will create job opportunity throughout the State, with the potential to create 100,000 jobs in the coming decade.

Future of Buildings

NYSERDA’s Future of Buildings report series will lay out comprehensive efforts by the State to modernize New York State’s buildings while reducing or eliminating their use of fossil fuels and associated GHG emissions, in alignment with the [Climate Action Council Scoping Plan](#). The series includes the following reports:

- **The Carbon Neutral Buildings Roadmap**, (published in January 2023), provides a guiding framework, general solution sets, and long-term vision through 2050 for this critical work. The Roadmap will lay out policy recommendations, areas for technology advancement, and key near-term activities such as workforce development and expansive outreach for consumer education and awareness.
- **The Building Electrification Roadmap** will examine policies and actions to accelerate heat pump adoption paired with thermal efficiency through 2030, including scenario analysis of achievable adoption in residential and commercial buildings.
- **Two Million Climate Friendly Homes Action Plan**, an interagency plan directed by Governor Kathy Hochul, will operationalize the path to achieving the State’s goals for clean, resilient buildings—specifically to achieve two million combined electrified and electrification-ready energy efficient homes and apartments by 2030 and to ensure that at least 800,000 of these homes support low- to moderate-income households.



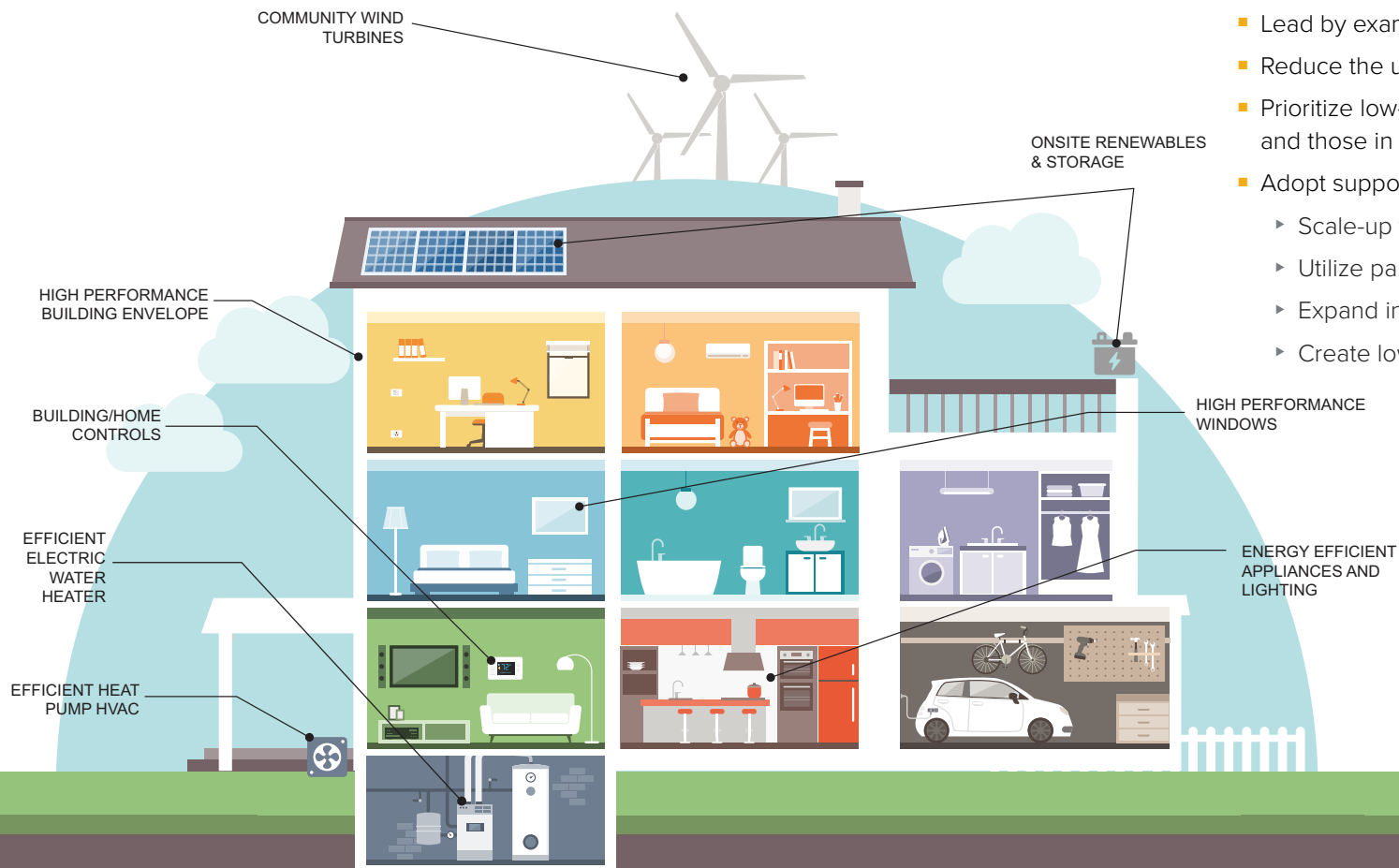
ATTRIBUTES OF A CARBON NEUTRAL BUILDING

- Maximizes energy efficiency
- No fossil fuel combustion for building energy services (all-electric end uses)
- Produces or procures zero-emission electricity
- Designed with flexible loads and/or storage that can respond to grid conditions
- Features resiliency measures that protect building occupants
- Designed with attention to embodied carbon and refrigerants

nyscrda.ny.gov/Carbon-Neutral-Buildings

STRATEGIES NEEDED TO DRIVE PROGRESS IN CARBON NEUTRAL BUILDINGS

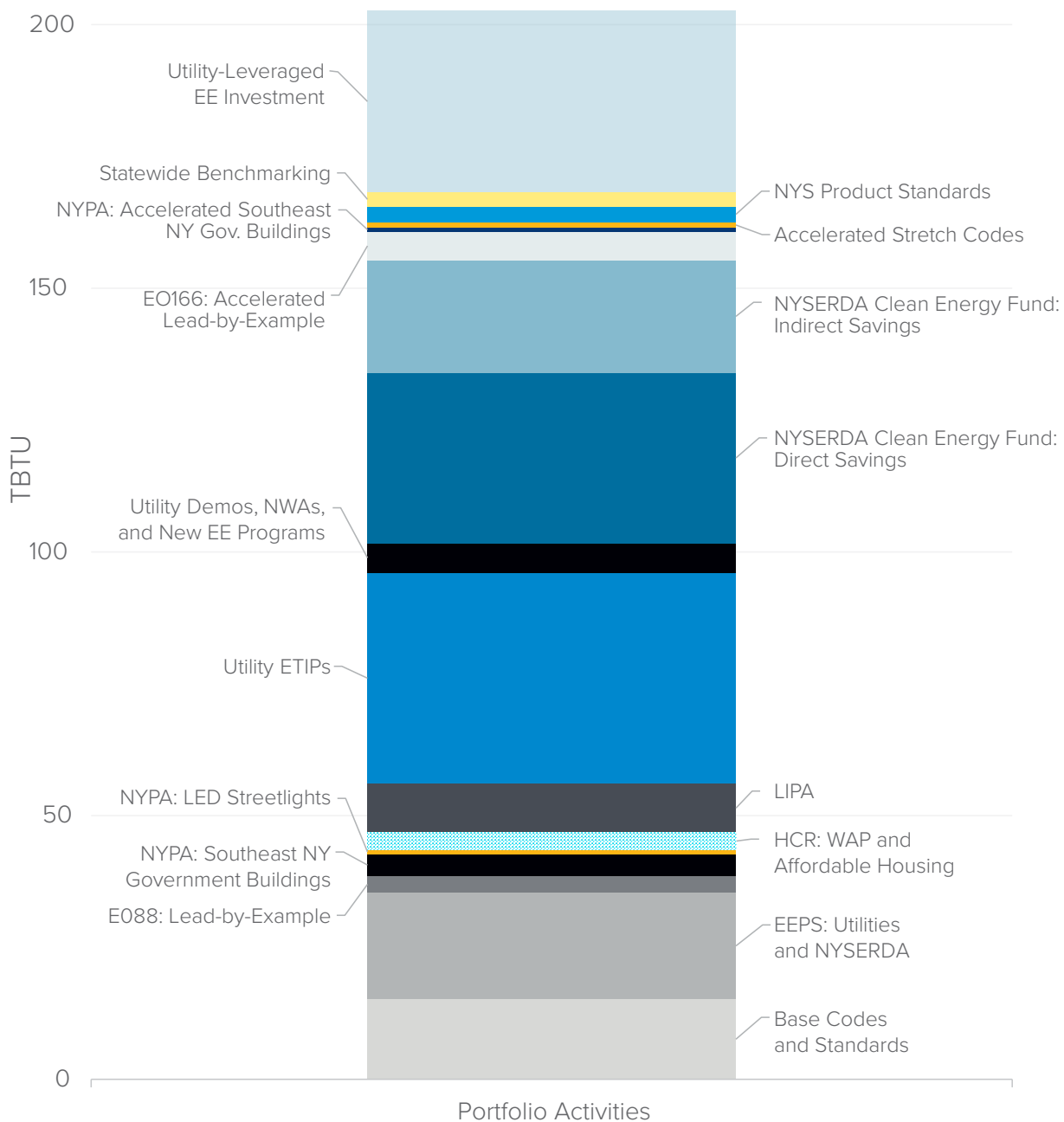
- Advanced codes for new construction
- Prohibit replacement of fossil-fuel heating and hot water equipment
- Benchmarking and disclosure of energy performance
- Performance requirements for existing buildings to improve energy efficiency
- Plan for the gas transition
- Fund research development and demonstrations
- Lead by example on embodied carbon
- Reduce the use of hydrofluorocarbons (HFCs)
- Prioritize low- and moderate-income residents and those in Disadvantaged Communities
- Adopt supporting policies to drive action:
 - Scale-up the workforce
 - Utilize partnerships
 - Expand incentives
 - Create low-cost financing





2025 target: 185 TBtu of onsite energy savings*

ENERGY EFFICIENCY ACTIVITIES TOTAL SITE TBTU SAVINGS
BY 2025 (CUMULATIVE ANNUAL, 2015–2025)



* Graphic does not reflect roughly 18 TBtu of overlap between activities.



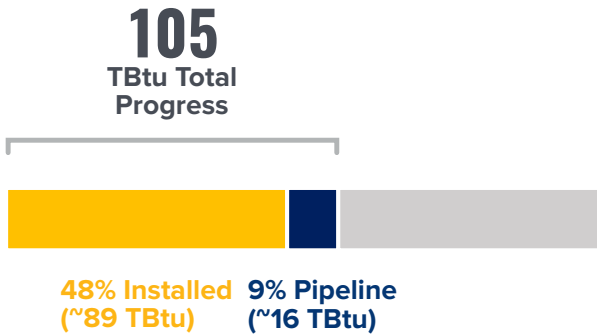
PROGRESS TOWARD THESE GOALS

The combined activities of NYSERDA, investor-owned utilities, and LIPA across historic and ongoing energy efficiency programs have so far achieved more than 89 TBtu of avoided energy use in the building sector—equivalent to fueling and powering more than 875,000 New York homes.

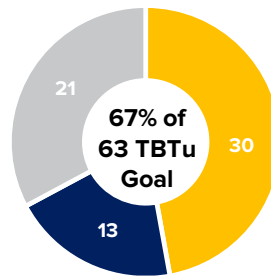
185 TBtu New Efficiency: New York Energy Goal

Progress data is through Q3 2022 for NYSERDA and utilities, and through Q4 2021 for LIPA.

■ Pipeline ■ Installed ■ Future Contribution



NYSERDA Progress



Clean Heat for All

In December 2021, NYCHA, NYPA, and NYSERDA launched the **Clean Heat for All Challenge**, an industry competition aimed at incentivizing heating and cooling equipment manufacturers to develop a new low-cost, easy-to-install packaged window heat pump (PWHP) system for existing multifamily buildings.

The PWHP would fit within a standard window frame, be installed by property management staff, not necessitate any drilling for condensate disposal or running refrigerant lines, and operate efficiently in downstate New York cold weather design temperatures. It would also replace and provide better insulation than the ubiquitous window air-conditioning unit. Such a design would significantly minimize costs associated with installing traditional heat pump systems.

NYCHA in turn, committed to purchase and install the winning model(s), positioning NYCHA as an early adopter of this new heat pump model design and proving public housing residents with access to improved, clean, and reliable sources of heating and cooling.

In August of 2022, Governor Hochul announced a \$70 million purchase order award to the two winning manufacturers, which will be used to initially procure 30,000 heat pumps to electrify approximately 10,000 NYCHA homes.

HIGHLIGHTED PROGRAMS AND INITIATIVES

New York State Clean Heat provides consumer incentives and develops the market for building electrification in coordination with utilities.

Empire Building Challenge demonstrates low-carbon solutions for tall buildings, in partnership with real estate industry and solution providers; the Empire Technology Prize program spurs new innovations.

Buildings of Excellence supports the design, construction, and operation of carbon neutral multifamily buildings, which includes affordable housing.

EmPower Plus will provide no-cost efficiency and electrification solutions to income-eligible New Yorkers, in conjunction with new energy affordability pilots.

Clean Energy Partnership in collaboration with HCR to deliver energy efficiency and electrification right into affordable housing financing transactions.

Clean Heat For All Challenge partners with New York City Housing Authority (NYCHA) and NYPA to develop and deploy affordable window-based heat pumps in thousands of low-income apartments.

Clean Green Schools provides assistance to more than 1,000 public schools in under-resourced communities to improve environmental sustainability, create healthier learning environments, and build the clean energy talent pipeline.



Clean Energy Economy

STATE POLICY GOAL FOR
THE CLEAN ENERGY ECONOMY

With over 165,000 clean energy jobs across the State at the end of 2021—and with hundreds of thousands of new jobs to be created by Climate Act investments on the near-horizon—New York’s nation-leading climate policies continue to drive investment and job-creation.

During the coronavirus pandemic, the sector showed tremendous resilience. Only 4% of New York State’s clean energy workers lost their job as of the end of 2020, compared to 9% of clean energy workers nationally, and in 2021 clean energy jobs grew to surpass pre-pandemic levels.

Looking forward, the State has an unprecedented opportunity to harness the economic development benefits expected from the bold, new federal incentives through the Inflation Reduction Act (IRA), the Bipartisan Infrastructure Act, and the Chips and Science Act. Combined, these federal programs are expected to invest more than \$500 billion to support clean energy deployment as well as domestic manufacturing of clean energy products and services. These federal programs offer a generational opportunity to create over nine million jobs across the U.S. and significantly increase the pace of U.S. manufacturing supply projects over the coming years.

New York State also has the opportunity to position itself as the innovation, research, and development capital of clean technology, focusing investment on next generation technology development at New York’s global research universities and industry research facilities. Combined, these activities will create thousands of jobs for all New Yorkers—establishing the supply chain for clean energy equipment and technologies in the State, as well as attracting national and global attention to New York’s education and industrial institutions to design the decarbonized economy of the future.



NYSERDA'S ROLE

- **Unlock new job growth**, harnessing the momentum created by historic level of clean energy investments being made at the federal level and the driving forces of innovation to create new opportunities for job growth. Additionally, leveraging public sector investment, with follow-on private sector investments, will attract global industries to New York.
- **Provide workforce development and training programs** to grow the training capacity and human resources needed to build the clean energy economy, while supporting a just transition for historically disadvantaged populations and those industries affected by the transition away from fossil fuels. Work closely with partners such as unions, SUNY, CUNY, NYS DOL, ESD, technical high schools and others to develop training that prepares new workers and those with jobs in fossil fuels and related fields for clean energy jobs.
- **Incorporate new progressive labor and economic development provisions**, including prevailing wage/project labor agreements, MWBE/SDVOB prioritization, Buy America provisions, and more.
- **Cultivate demand for clean energy solutions** to attract clean energy companies from all ends of the global supply chain looking to serve the growing local market, supported by proactive cross-agency attraction efforts.
- **Foster capital attraction and support commercialization** of products, services, and business models (deployment models) from clean energy startups and maturing companies.
- **Deliver more targeted assistance** to energy startups/innovation firms, leveraging support from federal stimulus efforts and future federal incentives to advance clean energy innovation.
- **Establish precedent for encouraging greater private sector investment and business models** through new, substantial commitments of institutional capital in the clean energy economy.
- **Leverage NYSERDA's position as a professional and skilled program administrator** to act in a critical role as a regional leader among states and within New York State, while helping unlock the benefit of federal programs to accelerate job and economic growth in New York.
- **Provide input to help inform the development of the new Office of Just Transition (OJT)**, as announced by Governor Hochul in her 2023 State of the State address, including through collaboration with NYS Department of Labor and other sister agencies.

INDICATORS OF PROGRESS

- Statewide clean energy industry jobs, job creation supported by Climate Act investments
- Number of New Yorkers, including people from priority populations, trained and employed in clean energy
- Commercialized climate solutions and launches of incubated firms, including related revenues
- Total value of capital mobilized using NY Green Bank support, and capital mobilized in Disadvantaged Communities



Achieving the Climate Act’s nation-leading goals and building a thriving industry sector will mean expanded deployment of existing technologies as well as substantial investment in the State’s clean energy innovation economy to develop new solutions for a low-carbon future.

To build an inclusive clean energy economy and cultivate a just transition, NYSERDA, along with other State agencies and clean energy industry partners will be ramping up efforts to develop a pipeline of skilled labor. Economic opportunities will open up to workers, communities, historically disadvantaged populations, and others who may be transitioning from fossil fuel-based economic activities. If New York State is going to be a strong competitor in the national race to domesticate the clean energy supply chain, our economic development initiatives need to be strategic, aggressive, and send strong signals to the market that New York is open for business.

STRATEGIES FOR 2023–2026

NY Green Bank

- Alleviate financing gaps in sustainable infrastructure markets by developing replicable, scalable financing products that encourage private sector lenders and investors to expand their activity in New York State’s clean energy markets.
- By 2025, achieve investment targets in clean transportation (\$100M), building electrification (\$100M), affordable housing (\$150M), and energy storage (\$200M).
- Demonstrate the attractiveness and viability of investments in projects benefitting the State’s disadvantaged communities by investing at least 35% of total capital commitments between January 1, 2020, and December 31, 2025, in these types of projects, consistent with the Climate Act.
- Launch the Community Decarbonization Fund in 2023, a \$250M concessionary wholesale funding pathway to support financiers in making sustainable infrastructure and decarbonization investments in Disadvantaged Communities.
- Continuously enhance operations and process management to create transactional efficiencies and ensure NY Green Bank is applying industry best practices to its investment, operational, and risk management procedures.
- Continue to explore and refine innovative financing models (e.g., lending alongside PACE) to help other financiers gain comfort with funding new asset classes, cash flow and risk profiles, and structures and approaches.
- Pursue federal funding opportunities available for green banks specifically—and sustainable infrastructure generally—to expand impact, boost liquidity, and deliver value for the State.

Innovation

- Support the development of climate technologies necessary to meet the State’s Climate Act goals through the implementation of competitive solicitations, the awarding of funds, and the strategic investment in technology, communities, and individuals.
- Address barriers to transformative innovation; support regulations, processes, and rulemaking that enable the future climate innovation economy; stimulate demand; and support public-private partnership cross-sector innovation efforts.
- Invest in the development of New York State’s economy by supporting recruitment and relocation of climate-tech companies to New York; encouraging the growth of existing companies already in the State; and increasing the vitality of the innovation ecosystem across the State.
- Continue to pursue transformational technology-specific programs for job growth, including offshore wind, battery, and hydrogen technologies; low embodied carbon materials; buildings; renewables; and resilience and grid technologies.
- Consistent with the goals of the Climate Act, ensure the State’s innovation ecosystem—as well as the innovations developed—deliver benefits to historically underserved and other Disadvantaged Communities.
- Coordinate with State and national innovation ecosystem partners to align and leverage State priorities and support New York State climate-tech companies’ access to finance and expertise.
- Demonstrate the role of innovation in deep decarbonization, helping New York State to develop pathways to achieve the most challenging last 20% of our long-term emission reduction goals.



Workforce Development

- Prioritize and scale-up our impact on the recruitment, training, job preparedness, and placement while providing wrap-around support for priority populations and Disadvantaged Communities.
- Work closely with pre-apprenticeship programs that provide pathways to registered apprenticeship programs (direct-entry programs), prioritizing programs that serve new workers who face barriers to employment, and leverage programs that can provide wrap-around services.
- Develop training infrastructure to upskill existing workers and prepare the next generation of clean energy workers in high-growth sectors like high-efficiency HVAC, building electrification, electric vehicle repair and charging stations, energy storage, and large-scale renewables.
- Ensure training curricula and programmatic support respond to industry and market needs focusing on stackable credentials, transferable skills, and hands-on training.
- Provide targeted support to reduce the time it takes to bring a new worker to full productivity and offset risks that might prevent clean energy firms from hiring or training new workers, particularly workers who face additional barriers to employment.
- Continue to support businesses and individuals entering into the clean energy sector through internships, fellowships and new jobs supported by on-the-job training incentives.
- Boost partnership and collaboration with labor unions, community-based organizations, helping develop and place employees firmly in career pathways.

Economic Development

- Establish and refine a strategy to help organize and make State economic development resources more impactful. This can be done via greater strategic alignment and less episodic engagement on supply chain and community-center developments.
- Strengthen and formalize working partnerships with key economic development stakeholders including Empire State Development, the Department of Labor, and regional and local economic development organizations. Coordinate clean energy business recruitment, site and infrastructure development, competitive advantage positioning (e.g., leveraging research and development assets), and incentive and resource administration to assure a seamless and impactful offering to clean energy industry decision-makers.
- Partner with economic development stakeholders to continuously examine, refine, and make recommendations to enhance the State's clean energy economic development "toolkit" focusing on New York-based companies seeking to pivot to clean energy supply chain businesses; more aggressive competition with other states for clean energy manufacturing projects; and offering incentives to non-clean energy companies seeking to fully decarbonize their businesses.
- Stimulate economic development in New York State through direct investments and other supportive action. For example:
 - ▶ **OSW Ports** – NYSERDA is investing \$200 million in offshore wind port infrastructure. The goal is to attract and drive the private investment required for this industry to establish operations in New York State that support the State's offshore wind investments. But—more importantly—by anchoring the "export potential" of these projects and supporting this growing industry across the U.S., long-term economic benefits to the State are maximized.
 - ▶ **Micron** – The \$100 billion Micron investment in Upstate New York is a transformational project to the State in terms of jobs, wages, community, and sustainability because investments can be made at the Micron facility as well as the surrounding community. As the project gets underway, it offers unique innovation opportunities that could inform the development of future incentives related to energy-intensive companies. As sustainability becomes a business imperative, companies like Micron can be attracted to New York because of its rich renewable asset base, sustained clean energy investment horizon, and policies driving the clean energy economy
 - ▶ **Electrovaya** – This producer of lithium-ion batteries announced in October 2022 that it will create up to 250 jobs at its first US plant. State funding will be used to support its battery technology and manufacturing facility and directly supports and leverages the recently announced Next-Generation Battery Production initiative, with ambitions to make New York State a National Hub for Battery Innovation and Manufacturing.

The recent passage of the IRA will significantly increase the opportunities to attract these kinds of projects to New York State.



TRANSFORMATION 2030

- Nearly half-a-million Climate Jobs in New York by 2030.
- Good-quality clean energy jobs supporting workers' families and delivering high-value to customers
- Fine-tuned matching of workforce development programs to the job creation from expected Climate Act investments
- An additional approximate \$12–\$15 billion in capital leveraged via NY Green Bank Innovation, with further capital mobilized through the generational opportunity to leverage federal funds under the Infrastructure Investment and Jobs Act, the CHIPS and Science Act, and Inflation Reduction Act.
- Comprehensive economic development strategy has made New York the leading market for clean energy business growth and supply chain localization.
- The Southern Tier of New York State has become the nation's next battery manufacturing and research hub.

HIGHLIGHTED PROGRAMS AND INITIATIVES

NY Green Bank works with the private sector to increase investments into the State's clean energy markets, including through transactions related to:

- Community solar/community distributed generation
- Affordable housing and building decarbonization
- Electric vehicles, charging infrastructure, and clean transportation
- Energy storage and hydrogen

Innovation supports an affordable and just transition and the achievement of New York's climate goals through investments in and market engagement activities including:

- Carbontech support programs with Activate NY and the Carbontech Development Initiative with Columbia University
- Hydrogen and other solutions for deep decarbonization and a resilient energy system
- Long-duration energy storage solutions that support a resilient, flexible, clean grid
- Natural solutions to mitigation greenhouse gases
- Building the grid of the future
- Clean heating and cooling research and development
- Tech-to-Market resources that include accelerators such as the Clean Fight and Cleantech Open Northeast; the M-Corps manufacturing scaleup program; and the Entrepreneur in Residence (EIR) mentorship program

Workforce Development supports training for new clean energy workers, driven by industry needs, and develops the clean energy sector talent pipeline:

- Career Pathway training in clean energy technology area
- Climate Justice Fellowship Program
- Building Operation and Maintenance Staff Training
- On-the-Job Training
- Offshore wind training to support the supply chain's needs for new and existing workers
- Clean Energy Internships
- Clean Energy Training, which builds training capacity that supports business hiring needs



Through programs, partnerships, and catalytic investments, NYERDA's **innovation** team is mitigating technical and commercial risk for key climate solutions. This enables faster, broader commercialization for the innovations New York State needs to meet our ambitious climate goals.

MANUFACTURING CORPUS (M-CORPUS)

Bringing innovative climate technology and climate tech manufacturing products to New York State

The M-Corpus program connects startups who are scaling products that lower greenhouse gases or reduce energy consumption with local supply chain partners, manufacturers, and suppliers—prioritizing connections in underserved communities.

4,300
participants
engaged

51
cohort
members
to date

\$414 M
capital raised

\$33 M
revenue earned

by the 51 cohort companies

The M-Corpus program has gained recognition outside of New York State and is attracting new technologies to the State.

Compared to the previous cohort, Cohort 4 (Fall 2021) attracted

27% more applicants
70% from out of state

NYERDA's Performance Management Study (Sept 2021):

- Estimated the average decrease in time to manufacturing for cohort participants has been **17 months**

Company Readiness Levels:

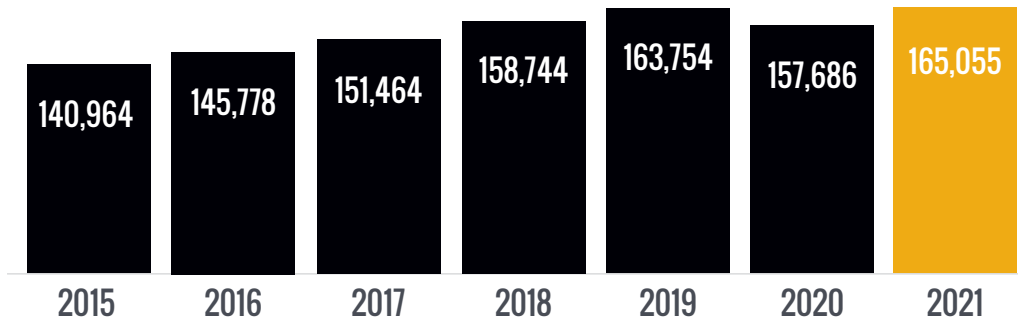
- During the 1-year program, cohort members have achieved average increases of:
 - Manufacturing Readiness Level (MRL): **1.6**
 - Commercial Readiness Level (CRL): **1.6**
 - Technology Readiness Level (TRL): **2.5**




165,000+ clean energy jobs in 2021

across New York State

ANNUAL CLEAN ENERGY EMPLOYMENT IN NEW YORK



CLEAN ENERGY EMPLOYMENT
BY TECHNOLOGY
(number of jobs, December 2021)

 **Building Electrification
and Decarbonization**
123k

 **Renewable Electric
Power Generation**
25k

 **Clean and Alternative
Transportation**
11k

 **Renewable Fuels**
2.7k

 **Grid Modernization
and Energy Storage**
2.5k

New York lost approximately 6,000 clean energy jobs amidst the COVID-19 pandemic. This represents the first employment decline since the annual Clean Energy Industry reporting series began in 2015.

However, New York State recovered more than the 6,000 jobs lost in 2020 and gained over 7,000 jobs between 2020 and 2021, leading to a record-setting number of clean energy jobs at more than 165,000.

The number of individuals with green jobs in New York State has reached a record level. Despite COVID-19's impact to our economy over the past few years, the Empire State has not only recouped the clean energy jobs lost in 2020, but has now exceeded pre-COVID employment levels. And furthermore, the burgeoning clean energy sector experienced a faster recovery when compared to other industries in New York State, a true reason for optimism about this industry's bright future.

nyserdera.ny.gov/Clean-Energy-Jobs



Resilient and Distributed Energy System

STATE POLICY GOAL
FOR THE ENERGY SYSTEM

Build a resilient and distributed energy system—and supportive social infrastructure—that can anticipate, absorb, adapt to, and recover quickly from a wide range of shocks and stresses, including climate, environmental, cyber, financial, aging infrastructure, and other emerging vulnerabilities.

In this period of dynamic and fast-paced change—marked by a global pandemic, wildfires, extreme storms, record-breaking heat, and cyber threats—the energy system faces a range of new risks and disruptions. Even as the system moves away from a more vulnerable centralized power generation towards an increasingly balanced, diversified, and digitalized network, the risks are real.



As New York State strives to meet its aggressive climate targets, we will need to contend with new risks and opportunities.

With electric power enabling nearly all critical infrastructure and services, including communications, emergency systems, banking, heating and cooling, and transportation, it is crucial that the transition to clean energy and net zero emissions also advances via a resilient and modernized grid. This includes needed actions to ensure infrastructure is designed for changing flood zones, sea level rise, and storm surge zones as well as new solutions and designs to withstand high windspeed, hail, and higher temperatures, and advancements in flexible, responsive resources such as energy storage and building load flexibility. Measuring and valuing risk reduction and resilience can help catalyze opportunities to harness the market system in service of these important goals.

A changing climate disproportionately impacts residents of Disadvantaged Communities—people who often have fewer resources to respond. Therefore, it is vital that investments also address questions of equity with targeted approaches for vulnerable communities. To this end, building a resilient and distributed energy system can also generate new workforce opportunities and create avenues to strengthen social cohesion, a quality of community resilience, through citizen engagement with shared energy and infrastructure.

NYSERDA'S ROLE

Lead by example by factoring resilience and clean energy goals in State operations.

Partner with other State agencies to identify and implement best practices around climate resilience, through the Extreme Heat Action Plan (EHAP). The EHAP will include the development and implementation of an extreme heat adaptation plan and a comprehensive State extreme heat emergency response as part of the State Comprehensive Emergency Management Plan in partnership with DEC, DOH and dozens of other agencies. This complements the energy assurance planning and coordination by NYSERDA and other State agencies to bolster the resilience of energy supply chain serving our State.

Spearhead next generation of climate adaptation research to provide insights for infrastructure, investment, and energy system planning decisions based on new/updated climate projection data.

Spur development and integration of a wide array of **smart grid technologies** that support a distributed energy system and advance resilience including energy storage, smart demand response, and vehicle to home/grid (V2H/G) flexible charging.

Continue to administer and refine flagship distributed energy resources (DER) programs like NY-Sun, and energy storage incentive programs that boost resilience, provide grid value, and reduce costs.

INDICATORS OF PROGRESS

- Progress toward energy storage (6,000 MW by 2030) and distributed solar (10,000 MW by 2030) deployment goals
- Statewide grid-interactive building load
- Percentage of NYSERDA solicitations that incorporate resilience provisions
- Penetration of homes and buildings equipped with clean onsite technologies such as solar, energy storage, or electric vehicles.



STRATEGIES FOR 2023–2026

- Accelerate pace of deployment for energy storage technologies to achieve updated 2030 goal of 6 GWs, as submitted for PSC approval in December 2022.
- Incorporate resilience considerations and incentives into NYSERDA programs, including floodplain mapping, onsite generation and storage, and other means that ensure investments factor in shifts such as increased electrification, future climate impacts, and other energy system disruptions.
- Explore potential mechanisms for the finance and insurance of resilient energy infrastructure, in partnership with the Department of Financial Services; support efforts to price resilience into energy, transport, and buildings, from insurance to construction codes and utility regulation.
- Spur development and integration of smart grid technologies to ensure buildings are flexible and responsive under changing conditions, with a focus on load pockets where environmental and health outcomes are critical (e.g., Disadvantaged Communities).
- Work with Public Service Commission to make better use of DER, including transportation and storage, in a way that fully integrates them to effectuate systemic grid operation changes that support grid resiliency and grid flexibility, such as balancing the growing intermittent renewable resources and enabling grid self-healing activities after an event.
- Coordinate and collaborate with key stakeholders on major activities aimed at integrating resilience planning and operations into New York State’s energy systems; for example, the Joint Utilities of New York and their climate change vulnerability studies and implementation plans.
- Continue efforts to scale up energy storage to achieve statewide goals, with a focus on the Downstate region where energy storage is critically needed to replace dirty peaker plants, and support grid congestion and offshore wind procurements.
- Foster virtual power plant (VPP) pilots into robust, mature programs offered ubiquitously by utilities.
- Drawing from the Carbon Neutral Buildings Roadmap work, develop solutions and playbooks for resilient communities and resilient housing focusing on passive survivability, resilience solutions for all-electric buildings and facilities of refuge to withstand future disruptions to the energy system—all recognizing that in an electrified future, efficiency is an inherent resilience measure.
- Leverage engagement with communities to catalyze county and municipal resilience strengthening, from backup for critical loads to physical spaces embodying a comprehensive vision for social cohesion and emergency resilience.
- Partner with NYS Division of Homeland Security and Emergency Services (DHSES) to refine model local laws based on climate assessment study findings, integrate clean resilience solutions into State hazard mitigation plan program and funding for backup power, and develop local guidebooks for resilience to supplement Community Risk and Resilience Act (CRRRA) plans.
- Incorporate strategies to optimize for resilience in an electrified future as homes are decarbonized, such as preparing homes for backup systems according to the occupants’ needs and the heating and cooling systems’ replacement cycle.
- Guide New York State Government towards the climate, energy, and sustainability goals set forth in Executive Order No. 22, while continuing to lead by example through NYSERDA’s own operations.

TRANSFORMATION 2030

- At least 10 GW of distributed solar; 6 GW of energy storage; and more.
- Ubiquitous and actionable energy data-access, allowing thousands of distributed energy assets (PV, EV, grid-interactive buildings) to communicate and participate responsively, delivering value to customers and to grid.
- Resilience considerations and investments imbedded in all energy/clean energy infrastructure and programming, with near full GHG-alignment for resilience solutions.
- Community-, neighborhood-, and household-level infrastructure investments to boost social cohesion and people-centric resilience, with physical refuges from extreme heat and weather events.



HIGHLIGHTED PROGRAMS AND INITIATIVES

The **New York State Climate Impacts Assessment**, launched in November 2021, is a multi-year study to explore how climate change affects New York State communities, ecosystems, and economy. Led and funded by NYSERDA, this collaborative climate research effort is being conducted in partnership with academic institutions, science organizations, community leaders, and industry representatives. Nearly 80 individuals from various organizations across New York State, the U.S., and Canada are assessing the state of the science on climate change impacts and adaptation for eight sectors across the state (agriculture, buildings ecosystems, energy, health, society & economy, transportation, and water). Additionally, Columbia University is developing downscaled climate projections for 12 regions of New York, and Industrial Economics is performing an economic analysis of climate impacts to the State. The results of this assessment, to be released in early 2023, will provide the scientific foundation for climate resilience efforts at all levels of decision-making across the State, including within NYSERDA.

Innovation's Smart Grid and Technology to Market teams will launch **initiatives to support a resilient, affordable, flexible clean grid**. Both teams combined cover a broad range of the innovation spectrum, from incubating new companies to applying new innovative products in a field setting for integration into the energy stem. Smart Grid is leading initiatives to help build communities of practice and develop needed solutions in key areas like resilience. Smart Grid initiatives will also focus on piloting and demonstrating

solutions aimed at increasing grid affordability and flexibility that are both effective and scalable. Tech to Market will continue to offer a variety of programs and services aimed at helping climatetech startups develop, commercialize, and scale their solutions in New York State, including solutions that support the transition to a clean grid. These interventions have taken and could continue to take the form of incubators, accelerators, corporate challenges, prize programs, and more.

Energy Storage engages those involved in building, installing, integrating, or researching energy storage technology, including efforts to expand opportunities to pair solar and storage statewide (continuing and expanding the strong Residential PV + Storage program on Long island through the DLM tariff). Energy Storage funds mature projects that can be deployed on the grid at scale to help integrate renewable energy, reduce the cost of grid operation, and maintain reliability and resiliency of electric infrastructure.

NYSERDA and DEC will collaborate with more than 20 other state agencies active in the **Extreme Heat Action Plan Work Group** to deliver a first of its kind comprehensive State plan to address present and future extreme heat. This will include developing a heat adaptation plan to address structural risks of extreme heat and heat inequities as well as a comprehensive response for the State to manage heat emergencies through the development of a heat annex for the State's Comprehensive Emergency Management Plan.

Offshore Wind, seeks to advance the cost-effective and responsible development of at least 9GW by 2035 while building a competitive and sustainable offshore wind industry in the U.S. This includes launching a "Masterplan 2.0: Deep Water" to plan for future actions to take advantage of a rapidly expanding industry, investing \$700 million in supply chain development in the State and training the associated workforce, effectuating transmission and grid improvements through a planned procurement process and in partnership with New York State Department of Public Service, and earnest engagement with regulators, industry, underserved communities, and a broad set of stakeholders to inform approaches and workstreams such as new research, analysis and program measures related to resilience and sustainability to reduce risks and improve outcomes.

Building Efficiency and Operations through Real Time Energy Management provides the ability to shed or shift loads in response to grid needs as well as the capability to stage critical equipment to maintain building services most needed to support safety and recovery. Programs such as Buildings of Excellence and Empire Building Challenge are demonstrating repeatable approaches to electrify heating loads in both new and existing buildings while also reducing buildings' peak demand through energy recovery, efficiency, and thermal storage, leading to clean and resilient buildings that also reduce strain on the electric system.



Building an Inclusive Clean Energy Economy

LONG-TERM VISION AND VALUE PROPOSITION

A strong and inclusive clean energy economy will lead to economic opportunities, improved health, and engagement for all New Yorkers especially those who have not benefitted in the past.

New York State's communities on the frontlines of the climate crisis, including environmental justice, low- and moderate-income families, communities of color, and otherwise Disadvantaged Communities, have disproportionately been impacted by energy costs; pollution from fossil fuel combustion; disinvestment in housing; structural inequities in education and workforce opportunities; and lack of access and inclusion in planning and policy making that affects their communities.



Realizing the objectives of the Climate Act will require foundational shifts in the development and implementation of clean energy policy, programs, and processes to ensure opportunities for residents and communities to participate in and benefit from the clean energy economy.

In advancement of the Climate Act objectives, the NYSERDA clean energy portfolio will focus investments to:

- Improve energy affordability.
- Reduce pollution from fossil fuel combustion across all sectors for environmental justice.
- Create new economic development opportunities for communities.
- Advance workforce development and training.

NYSERDA will focus on community capacity development and engagement to ensure the perspectives of residents are incorporated in the development and implementation of clean energy initiatives. NYSERDA is particularly focused on moving toward approaches that center the lived experiences and priorities of frontline communities. NYSERDA recognizes the role state policy has played in perpetuating inequities faced by historically marginalized communities. This includes low-income communities, Black people and other People of Color, Indigenous Nations and people, hard-to-reach underserved rural communities, and other areas of the State with high levels of poverty and limited access to resources.

In response, NYSERDA is working to leverage its critical role in addressing the climate crisis, energy injustice, and the legacy of environmental racism by engaging frontline communities and ensuring equity of process and outcomes for those disproportionately burdened by the current energy system and excluded from past waves of economic development. Specifically, NYSERDA is working to address the challenges historically marginalized communities have faced in accessing programs and using their lived experience to inform solutions that support an inclusive clean energy transition. With the creation of an Energy & Climate Equity team, NYSERDA is working to conduct more equitable, meaningful, and diverse community engagement. By working with community stakeholders to create pathways for meaningful input to shape energy policies and programs, NYSERDA will ensure historically marginalized communities are essential partners and beneficiaries in the transition to a clean energy economy.

Improving diversity, equity, and inclusion within and across NYSERDA's teams and functions has been prioritized to ensure the people, operations, and practices are more representative and responsive to the diverse needs of New Yorkers.

In addition, new Federal programs and initiatives aimed at delivering benefits to underserved communities include:

- **Greenhouse Gas Reduction Fund** — This \$27 billion first-of-its-kind program will provide competitive grants to mobilize financing and leverage private capital for clean energy and climate projects that reduce greenhouse gas emissions—with an emphasis on projects that benefit low-income and disadvantaged communities.
- **HOMES and HEEHR Rebate Programs** — New York will receive \$317 million in formula grants to support energy efficiency and electrification of homes, with a focus on lower income housing and housing located in disadvantaged communities.
- **Environmental and Climate Justice Block Grants** — Will provide grants and technical assistance to implement community led projects in Disadvantaged Communities to address environmental and public health harms related to pollution and climate change.
- **Weatherization Assistance Program (WAP)** — \$290 million announced (to date) supporting critical energy efficiency improvements in affordable housing.
- **Clean Buses programs** — Awarded \$70 million for clean school buses and \$173 million for clean transit buses announced (to date).
- **Climate Resiliency** — More than \$233 million announced (to date) supporting infrastructure resiliency.
- **Brownfield Grants** — Over \$10.5 million awarded to twelve communities (to date) to clean up clean up abandoned properties and complete lead and asbestos remediation.

NYSERDA is building its capacity to drive equity and help realize an inclusive clean energy economy through its direct investment, as well as through its work with State agencies, utility companies, and community-based organizations.



KEY CHALLENGES AND BARRIERS

- Systemic and institutional inequities have led to limited opportunities for communities of color and other frontline or Disadvantaged Communities to participate in and benefit from the clean energy economy, including access to green jobs, ownership of distributed energy resources, and informing policy and programs.
- Energy burden for lower-income households can exceed 20% of annual income, and nearly half of New York State's population has annual income below 80% of the Area Median Income, especially within communities of color.
- Access to capital, misaligned incentives, and historically fragmented administration of key programs present barriers to scaling clean energy solutions within the LMI market segment and Disadvantaged Communities.
- The size of income-eligible and disadvantaged populations requires innovative approaches to achieve adoption at scale, with careful attention to program/policy designs to avoid regressive outcomes/impacts.
- Engaging with residents of Disadvantaged Communities and bringing their diverse voices to the table is inherently lagging given the legacy of State policies that have marginalized and limited access to resources and power within low-income communities of color and others facing systemic inequities.

PRIORITY ACTIONS FOR NEW YORK

- Work toward the Climate Act goal of driving 40% of the benefits of clean energy spending to Disadvantaged Communities, which includes a finalized definition for Disadvantaged Communities from the Climate Justice Working Group, and an accompanying Benefits Framework.
- Increase engagement of frontline, climate-vulnerable communities in developing the clean energy economy, including ensuring community representation in decision-making and policymaking.
- Align State resources and strategy to increase impact from public investments in energy affordability and expand access to clean energy solutions for lower-income households, affordable housing, and Disadvantaged Communities.
- Leverage regulatory, policy, and financing mechanisms to increase adoption of clean energy solutions in affordable housing, including beneficial electrification.
- Facilitate a just transition to a clean energy economy by supporting unemployed or underemployed workers and priority populations, including workers in fossil-based industries, by addressing barriers to training and job opportunities for residents of Disadvantaged Communities and priority populations.
- Advance resilience to climate change and extreme weather events including within affordable housing and Disadvantaged Communities through clean energy solutions such as solar, energy storage, and passive house standards.
- Advance access to clean transportation for residents of Disadvantaged Communities and accelerate the transition to electric vehicles within Environmental Justice areas to reduce emissions and improve air quality.
- Develop solutions and models for deploying utility-scale DER, clean transportation, and energy efficiency in the built environment to reduce emissions and co-pollutants especially within Disadvantaged Communities.
- Quantify and maximize health and economic benefits from deploying clean energy solutions, especially within Disadvantaged Communities.
- Develop a path for decarbonizing affordable housing, including models that advance beneficial electrification across the LMI housing sector.
- Implement recommendations from the NYS Disadvantaged Communities Barriers and Opportunities Report as part of the Climate Act Scoping Plan.



Disadvantaged Communities Barriers and Opportunities Report

Released at the end of 2021, the report identifies the barriers faced by Disadvantaged Communities in accessing and owning certain services and commodities related to distributed renewable energy, energy efficiency and weatherization, low and no emissions transportation, adaptation and resilience, and other services and infrastructure that can reduce the risks of climate hazards. The report also identifies 35 opportunities to overcome these barriers, organized under eight principles and three themes that are: 1) ensure processes are inclusive; 2) streamline program access; 3) address emerging issues. The Scoping Plan expects all State entities to incorporate these themes into their programs, with NYSERDA leading the way by modeling best practices.

NYSERDA KEY ACTIONS FOR 2023–2026

- **Build community capacity** through the Clean Energy Hubs. Hubs offer the opportunity to engage residents and increase awareness of clean energy solutions, advance job opportunities and economic development, and facilitate community input in policy and program decision-making.
- **Ensure robust engagement opportunities** for historically marginalized communities. Opportunities will exist to identify cross-cutting issues, to provide input into the energy and climate equity strategy especially during the early stages of initiative planning via the Energy Equity Collaborative, and to get involved in program planning and design with financial support provided via a Disadvantaged Community stakeholder service provider pool and a Disadvantaged Community stakeholder reimbursement.
- **Expand workforce development** to include more comprehensive wrap-around support. Partner organizations will forge effective partnerships with organized labor and other clean energy employers. They will work to expand energy- and climate-related job opportunities for all New Yorkers, especially those from Disadvantaged Communities, underserved populations, and those transitioning to the clean energy industry from a fossil-based job.
- **Training for clean energy jobs** will continue to support internships, pre-apprenticeships, and fellowships. Participants will be introduced to clean energy jobs and financial assistance will be provided to employers to hire interns and fellows as a first step. With continued support, the interns and fellows will be brought on as full-time employees through the on-the-job training program. Additionally, opportunities to provide pre-apprentices with direct entry into Registered Apprenticeships will continue to be explored.
- **Facilitate partnerships** between training providers, employers, and the community-based organizations that are providing support services to people with barriers to training and employment. Employer partnerships are critical to developing training that will meet employer needs and increase the likelihood that workers will have the right skills and be strong candidates for jobs.
- **Evaluate different models to provide more comprehensive, longer-term financial support to employers for training and maintaining worker's skills**, such as employers serving the LMI market, that commit to hiring workers who face barriers to training and employment and providing them good paying jobs, benefits, on-the-job training, professional development, access to wrap around support and a workplace culture that is supportive and inclusive.
- **Develop replicable solutions** to advance beneficial electrification across the LMI market.
- **Advance models** that maximize community benefits from distributed energy resources, including ownership models.
- **Ensure all New Yorkers**, and especially those that have been historically marginalized and excluded from clean energy opportunities, are able to help shape and benefit from clean energy investments.



- **Implement a statewide portfolio** of energy efficiency initiatives with utilities to increase the impact and reach of LMI clean energy investments, which includes more community-centric offerings moving forward.
- **Integrate clean energy subsidies** from NYSERDA and utilities into affordable housing finance. This will advance the energy performance of these buildings and deliver co-benefits to tenants.
- **Launch the Community Decarbonization Fund**, a \$250 million concessionary wholesale funding pathway to support financiers in making sustainable infrastructure and decarbonization investments in Disadvantaged Communities (NY Green Bank).
- **Develop a more holistic set of community-centric program offerings**, providing multi-technology, place-based solutions to boost resilience and health outcomes in underserved and other Disadvantaged Communities.

HIGHLIGHTED INITIATIVES TO ADVANCE AN INCLUSIVE CLEAN ENERGY ECONOMY BY PORTFOLIO

NY-SUN / DISTRIBUTED ENERGY RESOURCES

Solar for All – utility bill assistance program funding solar for the benefit of homeowners/renters unable to access solar.

Affordable Multifamily Housing Incentive – photovoltaic (PV) installations serving affordable housing properties.

Technical Assistance and Predevelopment – grants to address key barriers to PV and storage projects providing benefits to LMI, Environmental Justice and Disadvantaged Communities.

Community Solar, Solar Paired with Storage, and Energy Efficiency – incentive adders for community PV, projects that pair PV with energy storage and provide resiliency and/or financial benefits to LMI customers and those living in affordable housing.

Peaker Reduction and Replacement – project deployments that support the potential for solar and energy storage to repower, replace, and back-down electric generating peaker units.

Good-Paying Community Solar Jobs – requires prevailing wage for workers on projects above 1 MW.

Place-Based Decarbonization Models – work with sister agencies to demonstrate novel partnerships surrounding place-based decarbonization with a focus on historically underserved and other Disadvantaged Communities, for example, the efforts to drive decarbonization at Hunts Point in the Bronx.

Clean Neighborhoods Challenge – scalable, community-aligned clean transportation solutions that reduce local air pollution and remove barriers to widespread electric and active transportation use in disadvantaged communities.

Electric Mobility Challenge – community-informed clean transportation solutions that transform access to electric mobility options and reduce emissions in disadvantaged communities.

Electric Truck & Bus Challenge – innovative demonstrations that accelerate medium- and heavy-duty vehicle electrification, expand access to cost-effective, user-friendly solutions, and reduce emissions.

NY GREEN BANK / FINANCE

Financing for Affordable Housing and Energy Efficiency in Disadvantaged Communities to catalyze clean energy within the existing capital stack for affordable housing, aiming to invest at least \$150 million in clean energy and energy efficiency solutions that benefit the State's affordable multifamily housing market.

Exploring tariff-backed and other innovative, inclusive financing models with approaches to overcome LMI/Disadvantaged Communities finance challenges, stabilize energy costs, and improve air quality in Disadvantaged Communities.

Partnering with other agencies to explore innovative opportunities to put NY Green Bank capital to work, including new areas such as energy resiliency.

Using Green Jobs – Green New York to provide New Yorkers with access to energy assessments, installation services, low-interest financing, and pathways to training for various green-collar careers.

Cultivating diverse ecosystem of investment partners and counterparties to explore funding to cover transaction costs and/or pro bono/in-kind transaction support.



INNOVATION AND RESEARCH

Innovation for Affordable Decarbonization – investments designed to reduce the cost of clean energy through optimization of the power grid, clean building technologies, and clean gas and liquid fuels.

Evolving work on resilience – tools to support adaptation to climate change for all New Yorkers, including those most vulnerable.

LARGE-SCALE RENEWABLES

RFP Design – when evaluating projects' economic benefits, prioritize disadvantaged communities, the role of renewables, and energy storage that supports the phaseout of the most polluting fossil generators downstate.

Agriculture, natural resources and smart siting policies – maximize co-benefits between industries and cultivate infrastructure ecologies (e.g., supporting supplemental income diversification, promoting carbon sequestration through soil enrichment, water quality improvements).

Implement 2021 Executive Budget proposals – complete Buy American market assessment, MWBE and SDVOB assessment, and implement updated prevailing wage requirements for project construction and operation.

Transmission planning – active participation in transmission planning to align with project development and seek important partnerships and cultivate benefits with communities, including via Tier 4.

Dedicated workforce development funding for offshore wind – follow-through on new solicitation focused on workforce development and training for existing and new workers, with major focus on residents of Disadvantaged Communities and other priority populations.

OTHER AUTHORITY-WIDE PRIORITY EFFORTS

Capacity-building and community engagement – Clean Energy Hubs to build local capacity and advance opportunities for residents within the clean energy economy; development of multilingual communication materials; providing financial support to encourage stakeholder engagement in processes; streamlining stakeholder engagement Authority-wide through equitable engagement framework that includes an Energy Equity Collaborative stakeholder forum and compensation for Disadvantaged Community stakeholders.

Community ownership of clean energy and distributed energy resources – new models for community ownership of distributed energy resources.

NYSERDA Diversity, Equity, and Inclusion (DEI) – implementation of DEI Strategic Plan released in 2021 to promote DEI progress Authority-wide, focused on engagement, updates to policies and processes, accountability and metrics, and leading by example in the clean energy sector.

Increasing supplier diversity – NYSERDA to increase utilization of MWBE, SDVOB and NYS Small Business Enterprise contractors.

Partnerships with labor unions – expand work with the organized trades and skilled labor providers to ensure increased opportunities for residents of Disadvantaged Communities and other priority populations through vocational training, pre-apprenticeships, and apprenticeships.

LEARN MORE ABOUT
NYSERDA'S DE&I EFFORTS

nyserdera.ny.gov/DEI



CLEAN AND RESILIENT BUILDINGS

Clean Green Schools – funding solutions for eligible P-12 schools to reduce school energy use and assist in the conversion to carbon-free fuels while educating students, teachers, and the community about clean energy.

EmPower Plus New York – no-cost and discounted efficiency and electrification solutions that will help income-eligible New Yorkers save energy and money—boosted by a new infusion of State funding and a new 6% affordability pilot for participating customers who fully electrify.

Equitable Electrification for LMI and Affordable Housing – replicable solutions for heat pump adoption in the LMI and affordable housing sectors, which will ensure customer protections.

NYSERDA/HCR Clean Energy Partnership – pre-development support, grants, and financing for building decarbonization measures deployed in Homes and Community Renewal's (HCR) affordable housing portfolio.

COMMUNITIES AND PARTNERSHIPS

Technical Assistance and Planning – support for housing agencies, contractors, developers, and builders for clean energy, high-performance building, and retrofits.

Community-Based Workforce Development – community-based training partnerships between clean energy businesses, training organizations, industry associations, and un/underemployed residents in Disadvantaged Communities.

On-the-job training for priority populations – support for clean energy businesses to hire persons from priority populations.

Career Pathways Funding and Training – solicitation to train and place new entrants in the clean energy industry.

Climate Justice Corps – funding for fellows to improve engagement with residents of Disadvantaged Communities; to identify community-based, climate justice focused projects and solutions; and to build capacity of local organizations to advance climate justice.

Building Training Capacity – supports new and existing works in clean energy areas such as energy efficiency, building electrification, offshore wind, and electric vehicle charging stations.

Career Awareness and Exploration – leverages the work of RoadTrip Nation to develop a clean energy career awareness campaign for high school students and young adults.



Supporting Clean Energy Jobs

LONG-TERM VISION AND VALUE PROPOSITION

New York State’s nation-leading climate action policies and investments have driven steady growth in the State’s clean energy economy, outpacing economy-wide growth for the past three years.

The clean energy industry demonstrated resilience during the pandemic, suffering fewer job losses than other sectors, and rebounding strongly in 2021. Continued investment is needed to build labor capacity and ensure that New Yorkers and New York firms reap the financial benefits that will result from delivering clean energy solutions at the scale needed to meet Climate Act goals. The State’s continued leadership and investment in its clean energy workers and businesses will also create the foundation for a just transition in the decades to come, beginning with prioritizing inclusive recruitment, training, job placement, and wrap-around support for individuals from Disadvantaged Communities, underserved populations, or those entering the clean energy workforce from a fossil-based job .



KEY CHALLENGES/BARRIERS

- Historically marginalized populations face greater barriers to employment.
- At a time when works' priorities and needs have changed, businesses are challenged with recruitment, training, and retaining workers.
- As public, private, and philanthropic resources are increasing, better coordination is needed across stakeholders. That way, resources can be maximized to better meet the needs of incumbent and new workers as they go through the process of recruitment, placement, and professional development.
- Ongoing demographic transitions and retirements require the State to entice new entrants to this energy field and ensure that training is in sync with job placement opportunities.

PRIORITY ACTIONS FOR NEW YORK

- Harness the State's clean energy investments to provide economic opportunity and quality jobs for New Yorkers, including LMI and historically disadvantaged populations.
- Support the work of the Climate Action Council and Just Transition Working Group to ensure workforce development considerations are prioritized.
- Integrate the final definition of Disadvantaged Communities and guidance from the Climate Justice Working Group into workforce-related programs and offerings
- Adopt best practices for inclusive stakeholder engagement in workforce development program design, such as compensation for consultation and input.

NYSERDA KEY ACTIONS FOR 2023–2026

- **Scale-up Career Pathways** and other successful models for clean energy apprenticeships, pre-apprenticeships, and job-readiness programs to build a talent pipeline especially from individuals within Disadvantaged Communities, priority populations, and fossil-based incumbent workers transitioning into clean energy.
- **Support build-out of OSW workforce training** coordinating with SUNY in advancing the Offshore Wind Training Institute (OSWTI) and other industry efforts already underway.
- **Leverage NYSERDA's purchasing power, procurements, and program design** to maximize opportunities for New Yorkers and New York firms—especially MWBE and Service-Disabled Veteran-Owned Businesses—installing, servicing, and supplying clean energy solutions.
- **Identify and work with partners** including Empire State Development's new Office of Strategic Workforce Development to grow key supply chains where New York firms can have a competitive advantage.
- **Support community based economic development projects** by leveraging existing NYSERDA clean energy programs, identifying more comprehensive funding strategies, and working with State, local, and utility partners.
- **Focus NYSERDA's relationship with other agencies and channel partners** on workforce development and training to develop complementary offers that increase collective impact and serve a wider base of workers.
- **Pursue funding opportunities** to complement/supplement our traditional funding sources to deliver wrap-around services (such as funding for transportation, tools, daycare, etc.) to help priority populations pursue clean energy workforce opportunities.
- **Continue to provide support for fellows, full-time hires, and others** to place individuals working in and for Disadvantaged Communities to advance local climate action priorities.
- **Explore novel community-based clean energy investments**, including Build-Ready project development to provide workforce support alongside renewable development and leveraging DOL resources where feasible.
- **Harness the State's clean energy investments** to provide economic opportunity and quality jobs for all New Yorkers, especially priority populations living in communities on the frontlines of the climate crisis.



Spotlight

New York State Climate Jobs Study

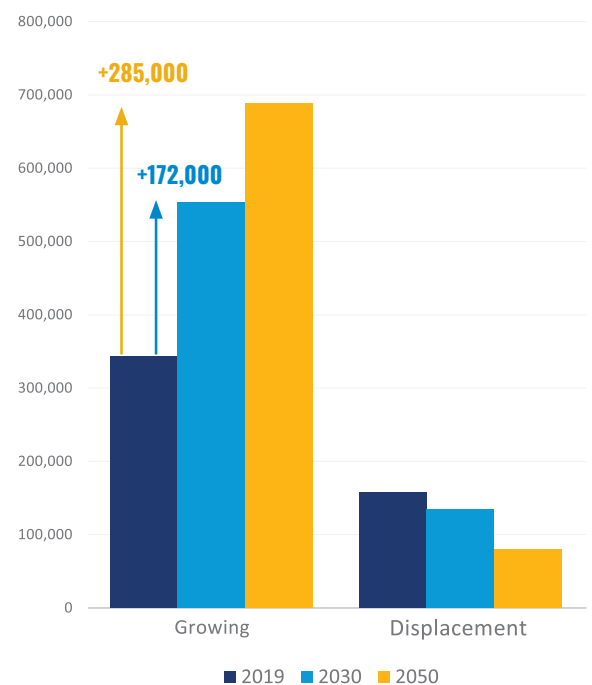
Based on independent research conducted for New York's Just Transition Working Group, Climate Act Scoping Plan Investments are expected to spur hundreds of thousands of new jobs in coming decades.

Expected clean energy job growth 2X greater than 2016–2020

More than half of new jobs will tackle building decarbonization

Offshore wind will be one of the fastest growing sectors

- Employment in growth sub-sectors increases by at least 172,000 jobs by 2030, a 55% increase in the workforce from 2019 to 2030.
- Employment grows in these sub-sectors by at least 285,000 jobs through 2050.
- In New York State, clean energy jobs, in their comparable sub-sectors, are expected to grow annually at more than twice the rate from 2021 through 2030 as the growth experienced between 2016 through 2020.
- By 2050, growth sub-sectors in New York State will reach nearly 600,000 jobs.



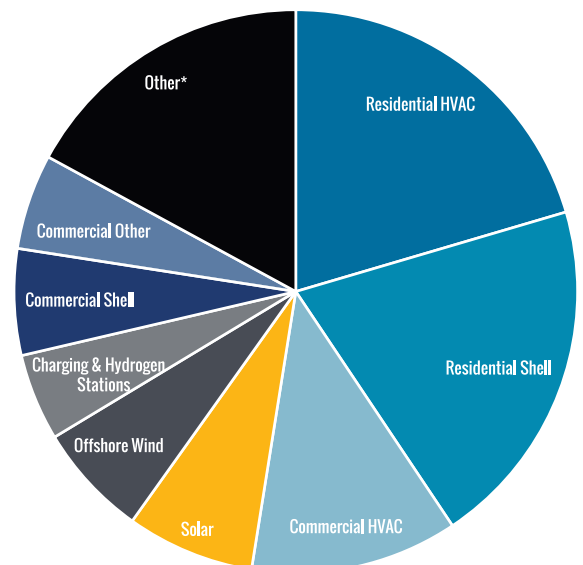
Key Employment Findings**

Sub-Sectoral Breakdown of 172,000 jobs added by 2030

- Over half of the new jobs, in the growth sub-sectors, from 2019 to 2030, will be found in the buildings sub-sectors (shaded blue).
- The next largest growth sub-sectors are solar and offshore wind electricity generation, and electric vehicle charging and hydrogen fueling stations.

* Includes Transmission, Storage, Other Generation, Bioenergy, Residential Other, Hydrogen, Onshore Wind, and Vehicle Manufacturing

** Key employment findings derived from S2: LCF Scenario. Learn more by reading the [New York State Just Transition Working Group Jobs Study](#).





Anode Cage: Dimensions differ depending on the foundation of a turbine but the component is scaling to 37' in diameter x 14' in height and weighing 21 tons (42,000 lbs) and protect steel foundations from corroding under the conditions of the ocean.

CASE STUDY

OFFSHORE WIND ADVANCED FOUNDATION COMPONENTS

New York State's goal of 9,000 MW of offshore wind by 2035 is working to spur capital investment and development of New York into the manufacturing hub of the offshore wind industry.

One example is the fabrication of Advanced Foundation Components for New York's **924 MW Sunrise Wind Farm**, which is being developed by **Ørsted** and **Eversource**. With more than 80 offshore wind turbines, the Sunrise Wind project alone will require many large components and will rely on the competency and capability of New York State manufacturers. An \$86 million dollar Advanced Foundation Component contract with project partner **Riggs Distler** will create over 100 new manufacturing jobs in Western New York and an additional 100+ union jobs assembling the components at the Port of Coeymans.

Advanced Foundation Components or Secondary Steel are components that are connected to the foundations of offshore wind turbines and serve several functional roles.

Boat landings and external ladders provide access at sea level for offshore wind technicians, internal suspended platforms are used to support electrical equipment and provide working space, and anode cages that are installed externally and below the waterline around a steel foundation provide corrosion protection from salt water. The anodes are fabricated with zinc and aluminum and cast around steel pipe. The anodes are then connected to metal collars forming the cages that installed over the foundation.

Ljungström is one of the New York companies that will be contributing to Sunrise Wind by manufacturing Anode Cage Assemblies, Monopile Door Assemblies and Supported Internal Platform Assemblies for Riggs Distler. Located in Wellsville, NY, Ljungström is embracing the clean energy transition by expanding their manufacturing capabilities and retrofitting their existing facility to break into the green economy. Ljungström invested in brand new equipment, ranging from cutting and bending machines, to a state-of-the-art paint and coating, and is hiring workers in Alleghany County to support the new work.

As New York's offshore wind ambitions grow, companies like Ljungström are poised to capture future business and drive the State's green economy forward.

Partners:



A CENTURI COMPANY

LJUNGSTRÖM



Ørsted

EVERSOURCE



Accelerating the Transition from Fossil Natural Gas to a Low-Carbon Future

LONG-TERM VISION AND VALUE PROPOSITION

In order to realize our goals of a carbon neutral economy by mid-century, New York needs to move away from dependence on the combustion of fossil natural gas to heat homes and businesses and power industrial processes.

This transition away from fossil natural gas to lower-carbon energy sources may be one of the most challenging pieces of our decarbonization agenda.

New York State needs to scale up demand-reducing solutions such as energy efficiency and electrification for heating, which will be the State's core strategy and priority path for space heating and cooling needs.

In strategic hard-to-electrify use cases, the State will need to pursue R&D to prove and deploy deep decarbonization innovations to replace fossil natural gas with alternatives with lower climate impact—such as green hydrogen and renewable natural gas, among others. That is one reason why New York State is pursuing a federal clean hydrogen hub award from the Department of Energy (DOE).

Additionally, given the global warming potential of methane, losses/emissions of gas will need to be reduced throughout the gas infrastructure for safety and environmental reasons.



KEY CHALLENGES/BARRIERS

- The cost that consumers pay for fossil natural gas does not reflect its full negative societal cost, especially in terms of environmental and climate impacts, resulting in a market signal that is inconsistent with the State's public policy objectives.
- Over the last decade, the relative affordability of gas has made it favorable among residents for home heating and hot water, and also among businesses and particularly industrial users, where high quality heat for process applications is prized and there are few commercially available electric solutions. However, gas market prices have shifted structurally in the last one to two years, which seems likely to signal increased prices in the decade ahead. This price risk is not yet considered in most consumer decisions.
- While efficient, all-electric alternatives can fulfill most residential applications and many commercial ones, such alternatives do face several limitations, including high upfront cost, lack of awareness among consumers, lack of market infrastructure (familiar installers, marketing), and technical barriers for certain buildings.
- As consumers proactively transition away from using fossil natural gas, this may raise the burden of paying for the cost of gas infrastructure for those remaining on the gas system who may not have the resources to swiftly move off.
- The existing gas distribution system is a multibillion-dollar asset that will exist even as consumption is reduced, and it needs investments to be maintained to keep people safe.
- Similarly, the existing fossil natural gas sector employs thousands of workers statewide that will need to be transitioned to other clean energy industries and otherwise supported in the transition.
- Low-carbon fuels, including hydrogen and renewable natural gas, still emit air pollutants when used in combustion processes, such as emissions of nitrogen oxides (NO_x), which can pose additional burdens on environmental justice and other vulnerable communities when compared to non-emitting alternatives.

PRIORITY ACTIONS FOR NEW YORK

- Address near-term downstate gas supply constraints minimizing investment in infrastructure and maximizing demand-side solutions to reduce winter gas peak including energy efficiency, demand response, and electrification.
- Advance a comprehensive gas transition planning process toward a managed, phased, and just transition from fossil natural gas, focusing on safety, equity, reliability, and affordability.
- Build market capacity, expand product availability, and drive cost reductions in commercially available fossil natural gas alternatives like electrification (through NYS Clean Heat), while developing new long-term solutions.
- Advance recommendations for building and industrial sectors via Climate Action Council, including codes and standards aimed at driving adoption of efficient, low-carbon solutions and clean alternatives for heat/industrial process.
- Level the playing field for clean energy alternatives and end the legal obligation to serve customers with fossil natural gas, while maintaining affordability for New York's most vulnerable customers.



NYSD KEY ACTIONS FOR 2023–2026

- **Develop and publish long-term roadmaps** for advancing all-electric clean homes and buildings and advancing green hydrogen, as alternatives to fossil natural gas.
- **Phase out support for fossil natural gas** in all programs within two years and reorient investments around building shell improvements, electrification, and development of deep decarbonization alternatives.
- **Provide thought leadership** for gas system transition and engage in transition-related proceedings.
- **Prove-out solution set for LMI/Disadvantaged Communities electrification**—tailored to building stock and housing energy affordability needs.
- **Finalize and implement the 2 Million Climate Friendly Homes Action Plan** to accelerate the transition of homes, including LMI households, off of inefficient and fossil-based heating systems.
- **Maintain energy affordability for all New Yorkers**, prioritizing LMI households and strategies that can limit energy cost burden to below 6% of income.
- **Focus on reducing cost of alternative clean heating/cooling through innovation**—demonstrate heat pump technologies (and other carbon-reducing solutions) in large commercial/multifamily buildings, working with property owners, and engaging manufacturers to define/deliver/tailor products to meet New York’s building needs.
- **Support cutting edge innovations** to reduce dependence on fossil natural gas for heating, process loads and peak demand needs including long-duration storage.
- **Build understanding of and momentum for deep decarbonization technologies**, including clean hydrogen, carbon capture, and other forms of carbon-neutral tech, leveraging federal funding opportunities—including via New York Clean Hydrogen Hub efforts.
- **Critically evaluate and assess holistic impacts from deep decarbonization technologies**, including ongoing work to assess air pollution, land use and affordability impacts, and identifying and advancing opportunities with the greatest decarbonization potential.
- **As part of a forthcoming Hydrogen Roadmap, study the decarbonization potential of clean hydrogen** across the key pathways of energy efficiency, industrial electrification, low-carbon fuels, and carbon capture utilization and storage to enable state-wide activities to pursue federal funding to accelerate the deployment of innovative technologies within New York.
- **Support the development of next-generation thermal energy districts** that can deliver affordable, resilient heating and cooling to buildings while providing direct employment opportunities to support the transition of the gas workforce—including through the advancement of utility thermal energy network pilots where feasible and the development of a regulatory framework for these systems.

Hydrogen Roadmap

A comprehensive strategy to advance green hydrogen as a solution in New York State, considering technology needs and risks, infrastructure, resiliency, costs, and environmental justice. Along with several other actions, including a regulatory framework and prize program, the Hydrogen Roadmap will help position the State to compete for nearly \$10 billion in federal funding for green hydrogen R&D.



Fostering Healthy and Resilient Communities

LONG-TERM VISION AND VALUE PROPOSITION

New York’s diverse communities have a critical role to play in the State’s clean energy transition.

They are essential partners both in the rapid expansion of clean energy generation as well as the decarbonization of society—including the built environment and the transportation and industrial sectors— hereby creating healthy, livable environments and supporting larger projects with far-reaching statewide benefits.

But to succeed, we need to provide communities with the necessary tools and other resources to carry out this work. On the renewable generation side, efforts such as the Office of Renewable Energy Siting (ORES), NYSERDA’s Build-Ready program, and the new host community benefits framework, are designed to reduce barriers for localities and overcome obstacles to mutually beneficial project development.



In order to decarbonize the State's building stock by mid-century, New York will have to quickly move beyond a building-by-building approach to a neighborhood-by-neighborhood approach, developing carbon neutral communities.

NYSERDA provides planning resources for community-scale decarbonization projects, and is supporting several communities as they embark on the decarbonization transition. Integrating decarbonized transportation solutions will also be paramount in providing holistic community-scale climate solutions with neighborhood-level impact.

The disparate health and air quality impacts borne by Disadvantaged Communities as a result of historical and continuing environmental injustice remain front of mind, a reality that has been underscored and exacerbated by the COVID-19 pandemic. We can begin to reverse and repair these inequitable community outcomes by providing resources to Disadvantaged Communities that ensure all New Yorkers benefit from the clean energy transition. Decarbonized communities will have improved outdoor air quality (e.g., through the elimination of peaker plants and on-site combustion of fossil fuels), safer and healthier buildings (through electrification, energy efficiency and measures to guard against airborne pathogens), job and economic opportunities, and increased economic activity, collectively fostering healthy communities.

There are more than 6 million buildings in New York State.

More than 200,000 buildings per year would need to be decarbonized for the next 30 years to address the entire existing building stock by 2050. The State needs to build scale to succeed, and action at the community-level will be critical.

New York State Communities

New York's communities are as diverse as New Yorkers themselves, spanning 932 towns, 62 cities, and 10 Indigenous Nations. More broadly, though, communities throughout the State have shared interests in preserving and expanding quality of life including affordable housing, education, job opportunities, clean air and water, and health and safety.

New York's communities are essential partners in this clean energy transition and must be engaged in planning, coordination, and decisions that will impact generations to come.



KEY CHALLENGES/BARRIERS

- Communities lack resources to adequately address many on-the-ground challenges associated with the energy transformation—from competing interest for land use and challenging siting issues, to a diverse building stock coupled with complex and evolving building codes and aging infrastructure.
- Local resource constraints were exacerbated by COVID-19 and the associated economic challenges.
- Some communities have a negative perception of large-scale renewable projects, and are negatively disposed to development of these projects.
- Disadvantaged communities face disparate exposure to air pollution from multiple sources (vehicles, power plants, industrial facilities) and often are burdened with a building stock that does not provide healthy indoor air quality.
- Health and safety benefits that result from community decarbonization are not always well understood and can be difficult to quantify and monetize.

PRIORITY ACTIONS FOR NEW YORK

- Continue to provide and expand upon training and technical resources to help communities prepare for responsible renewable energy development, embrace decarbonization and energy efficiency, and support progressive building codes.
- Facilitate paths for community engagement on decarbonization wherever possible, including through grants and financial support, local coordinators, clear technical guidance and templates, recognition, and interagency coordination.
- Leverage the 12 Regional Clean Energy Hubs announced in 2022 to connect local residents with clean energy solutions including through NYSERDA and their local electric utility programs as well as workforce development opportunities.
- Incorporate decarbonization into various existing State funding programs, like the Downtown and Upstate Revitalization Initiatives and other opportunities under the Consolidated Funding Application.
- Adopt equitable engagement strategies and holistic, multi-sector approaches to investment in order to address longstanding disparities in exposure to air pollution and inadequate building stock investment.
- Develop and establish a robust framework for host community benefit agreements as part of large-scale renewable projects clarifying local benefits and making benefits packages more compelling.
- Through the Office of Renewable Energy Siting, issue new uniform, standardized guidelines for responsible large-scale renewable siting to improve consistency, expedite approval of projects not located on greenfield sites, and reduce burdens for local community intervention.
- Focus on turning underutilized lands—such as brownfields, landfills, and former industrial properties—into revenue-generating clean energy projects, and advance project development on other sites that present development challenges for commercial developers.
- Facilitate passage and/or implementation of proactive community-level clean energy policies such as benchmarking, and other climate-friendly codes, standards, and mandates recommended by the Climate Action Council.



NYSDERDA KEY ACTIONS FOR 2023–2026

- **Site and build renewable power and distributed clean energy projects** that provide community benefits by providing guidance on project economics, taxes, siting assistance to local governments, and ensuring projects deliver tangible benefits to residents of host communities.
- **Grow local partnerships and drive investment** in clean energy on brownfields or otherwise underutilized land, offering support including through grants under the Just Transition Site Reuse Planning Program.
- **Implement programs that provide technical and financial assistance, build local capacity, and facilitate local engagement** for communities to support community-scale decarbonization through the Clean Energy Communities Program and the Clean Energy Hubs.
- **Directly partner with municipalities, communities, and individual landowners** to promote neighbor-to-neighbor clean energy campaigns and testimonials, sharing best practices by local government champions for clean energy.
- **Partner with stakeholders and Community-Based Organizations (CBOs) within Disadvantaged Communities** to co-develop local clean energy agendas and deploy climate resilience hubs that enable residents to safely shelter in place through community-scale distributed energy resources including solar, storage, green hydrogen, and district geothermal systems.
- **Catalyze novel clean transportation and zero-emission vehicle/mobility deployments** with prize funding supporting clean vehicles, personal mobility, and medium- and heavy-duty transportation transformations that benefit environmental justice communities.
- **Help communities address the dual challenges of sustainability and indoor air quality**, providing building science expertise and creating greener and healthier schools.
- **Leverage funds that can drive novel approaches** to realizing health and energy benefits, including the Healthy Homes pilot that is using health dollars and avoided health/insurance costs to finance electrification, energy efficiency, and clean energy upgrades.
- **Develop and implement the Extreme Heat Action Plan** in partnership with DEC, DOH, and dozens of other State Agencies as well as municipal and community stakeholders as announced in January 2022, to address the threat of extreme heat in Disadvantaged Communities, areas of employment, and recreational zones across the State and to mitigate neighborhood climate impacts associated with extreme heat through measures such as shade structures, cool roofs, cool pavements, parks, natural canopies, spray pads, expanding access to home cooling solutions, and more.
- **Incorporate strategies to optimize for resilience** in an electrified future as homes are decarbonized, such as preparing homes for backup systems according to the occupants' needs and the heating and cooling systems' replacement cycle.
- **Provide communities with planning services** to inform future decision making at the local level to help mitigate negative impacts of pending or future fossil fuel power plant closures.
- **Support municipal utilities and rural electric cooperatives** to undertake climate vulnerability assessments and undertake measures that strengthen the resilience of the electric grid.
- **Increase energy efficiency and renewable energy generation** at State-owned buildings and public schools.

Funding

FUNDING SOURCES

Several funding sources help NYSERDA advance the State’s clean energy goals and achieve its 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. The CEF was reaffirmed by PSC Order in August 2021, and is also being considered alongside other State clean energy programs in the New Efficiency: New York review.

Clean Energy Standard

As authorized by the PSC, these funds are realized by NYSERDA through the sale of Tier 1 Renewable Energy Credits (RECs), Tier 4 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, though a pending NYSERDA petition proposes to modify this process moving forward. As needed, utility financial backstop collections may be called on to meet funding shortfalls. These commitments are typically paid out over a 20–25 year contract term upon delivery of RECs (for Tier 1, OSW, and Tier 4; contract terms are shorter for Tier 2 RECs and ZECs).

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.

Federal Funding

Federal funding will be leveraged to enhance NYSERDA’s most critical efforts and topline mission outcomes, including via partnership with sister State agencies. NYSERDA will be targeting, on a strategic basis, block grant and competitive funding opportunities via the Infrastructure Investment and Jobs Act, Chips and Science Act, and Inflation Reduction Act, as well as through additional spending appropriations made in 2023 and beyond.

Other Funds

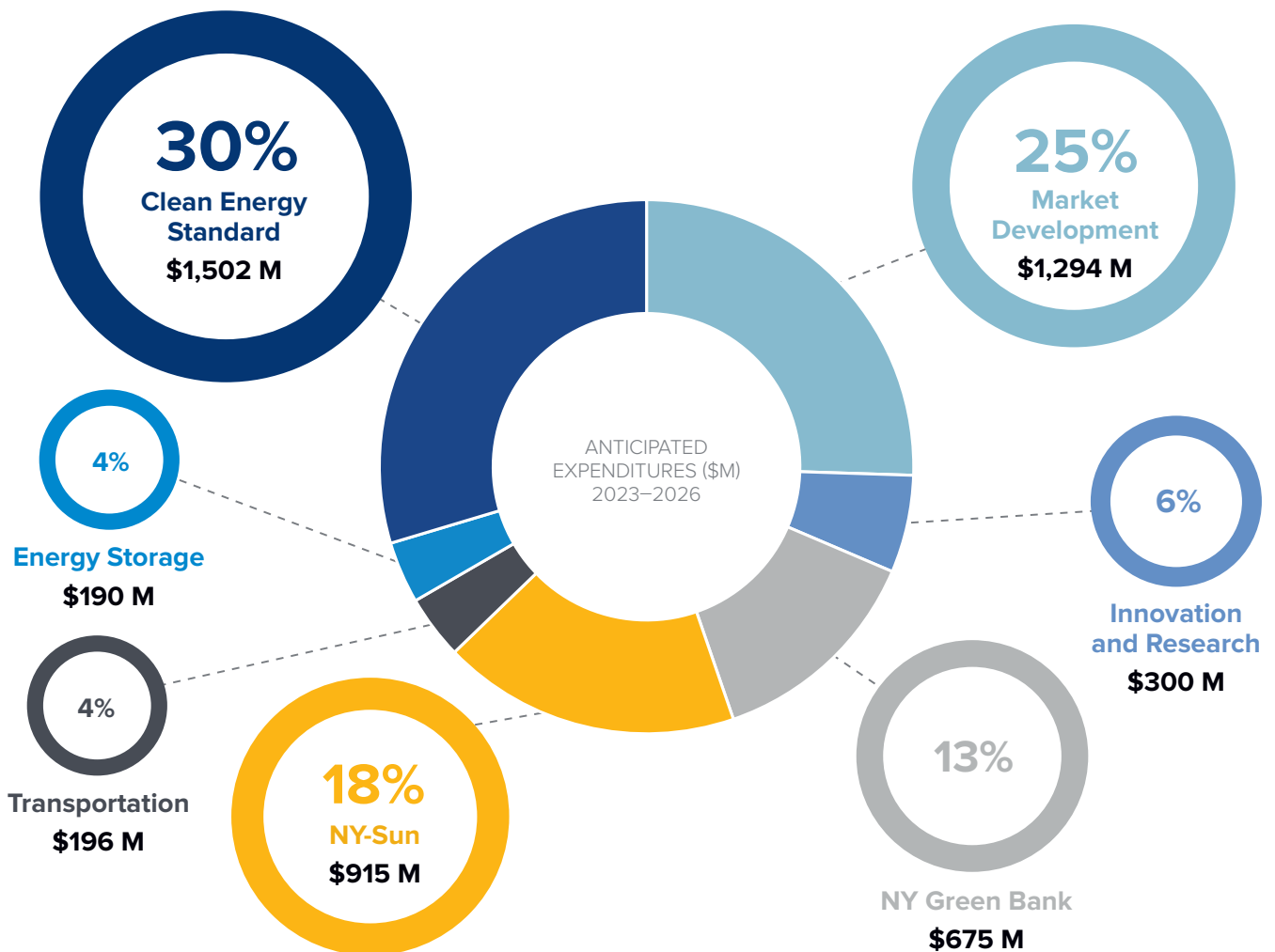
Includes sources provided by various sponsors used for specific purposes. Public funds are leveraged considerably with private sector funding through NYSERDA programs.

PLANNED FUNDING (2023-2026)

RENEWABLES
ENERGY EFFICIENCY & BUILDINGS
EMISSIONS REDUCTIONS
CLEAN ENERGY ECONOMY
DISTRIBUTED ENERGY SYSTEM

INVESTMENT AREAS & PRIORITY INITIATIVES	ESTIMATED 3-YEAR INVESTMENT LEVEL	% OF TOTAL	NYSDA MISSION OUTCOME(S) ICONS INDICATE RELEVANCE FOR PLANNED FUNDING				
Clean Energy Standard	\$1,502,439,483	29.6%					
Market Development	\$1,293,854,534	25.5%					
NY-Sun	\$915,366,442	18%					
NY Green Bank	\$675,000,000	13.3%					
Innovation and Research	\$299,712,291	5.9%					
Transportation	\$196,000,000	3.9%					
Energy Storage	\$189,526,635	3.7%					
Total	\$5,071,899,384						

Note: the anticipated expenditures represented in the table are based on currently approved funding (Orders of the Public Service Commission, NYS Appropriations, Regional Greenhouse Gas Operating Plan, Federal Grants, and the NYS Bond Act). The funding table does not include future funding not yet approved (Energy Storage Road Map 2.0, Federal funding for the Hydrogen Hub, broader funding for the Two Million Combined Electrified and Electrification-Ready Homes by 2030, etc).



Appendix: NYSERDA's Structure

NYSERDA BOARD MEMBERS

Richard L. Kauffman

NYSERDA Chair

Charles Bell

NYSERDA Vice Chair

Sherburne B. Abbott

Johns Hopkins University

Rory M. Christian

Chair and CEO, New York State Public Service Commission

Marie Therese Dominguez

Commissioner, New York State Department of Transportation

Justin E. Driscoll

Interim President and Chief Executive Officer, New York Power Authority

Arturo Garcia-Costas

Program Officer for the Local, National and International Environment, The New York Community Trust

Jay L. Koh

Managing Director and Founder, Lightsmith Group

Frances A. Resheske

Con Edison (Retired.)

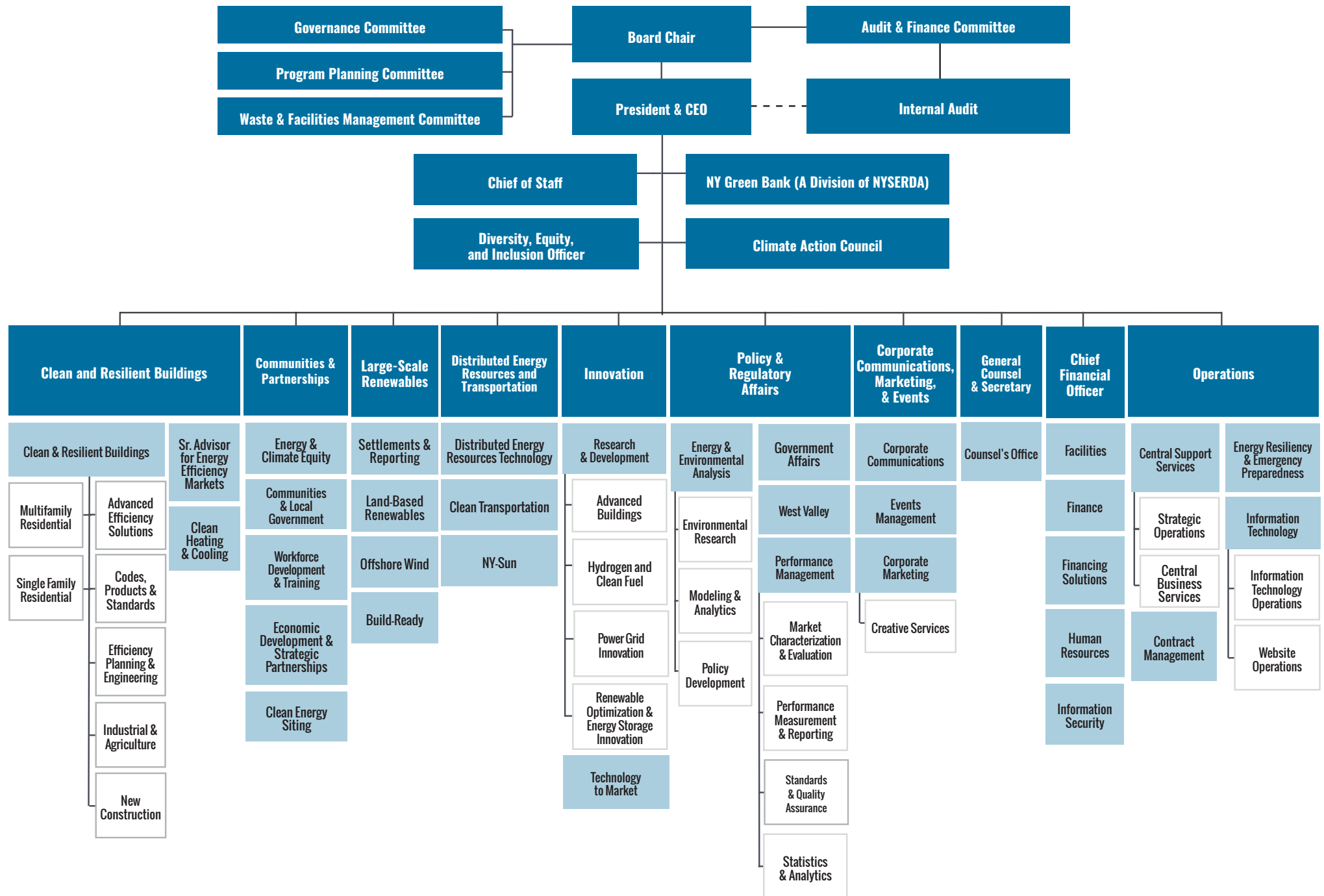
Basil Seggos

Commissioner, New York State Department of Environmental Conservation

Sarah Sadie McKeown

President, The Community Preservation Corporation

NYSERDA ORGANIZATION CHART





NYSERDA

State of New York

Kathy Hochul, Governor

New York State Energy Research and Development Authority

Richard L. Kauffman, Chair | Doreen M. Harris, President and CEO