

# **New York State's Regional Greenhouse Gas Initiative Investment Plan**

*2024 Operating Plan*

Prepared by:

**New York State Energy Research and Development Authority**

Albany, NY

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# Acronyms and Abbreviations

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BNL	Brookhaven National Laboratory
CBETA	Cornell-Brookhaven Energy Recovery Line Test Accelerator
CEF	Clean Energy Fund
CGC	Cleaner Greener Communities
CH <sub>4</sub>	methane
CIGS	copper indium gallium selenide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> e	carbon dioxide equivalent
CU	Cornell University
DC	direct current
DEC	New York State Department of Environmental Conservation
DOE	United States Department of Energy
EEPS	Energy Efficiency Portfolio Standard
EIC	electron-ion collider
EPA	United States Environmental Protection Agency
eRHIC	Electron Relativistic Heavy Ion Collider
ERL	Energy Recovery Line
FY	fiscal year
GHG	greenhouse gas
GJGNY	Green Jobs - Green New York
GW	gigawatts
HPwES	Home Performance with ENERGY STAR®
IPCC	Intergovernmental Panel on Climate Change
kWh	kilowatt-hours
LIPA	Long Island Power Authority
LMI	low- to moderate-income
MMBTU	million British thermal units
MPP	Multifamily Performance Program
MW	megawatts
MWh	megawatt-hours
N <sub>2</sub> O	nitrous oxide
NYCRR	New York Codes, Rules, and Regulations
NYGATS	New York State Generation Attributes Tracking System
NYPA	New York Power Authority
NYS	New York State
NYSERDA	New York State Energy Research and Development Authority
PEV	plug-in electric vehicle

PM	performance management
PSC	New York State Public Service Commission
PSEG-LI	Public Service Enterprise Group—Long Island
PV	photovoltaic
R&D	research and development
RE	renewable energy
REC	renewable energy certificate
REDC	Regional Economic Development Council
REV	Reforming the Energy Vision
RGGI	Regional Greenhouse Gas Initiative
RPS	Renewable Portfolio Standard
SBC	System Benefits Charge
SIT	State Inventory Tool
SUNY	State University of New York
W	watts
WAP	Weatherization Assistance Program

# Summary of Benefits

The Regional Greenhouse Gas Initiative (RGGI) portfolio presents programs that reduce and avoid GHG and other air pollutant emissions as well as demonstrate New York State’s commitment to its environmental goals. Specifically, program investments listed in this update of the operating plan are anticipated to result in significant carbon dioxide equivalent (CO<sub>2</sub>e) emission reductions, energy savings, and bill savings as presented in Table 1.

**Table 1. Anticipated Remaining RGGI Benefits by Program**

Program	Planned Expenditures (millions of dollars)		Net Energy Savings (MMBtu)		Net Electricity Savings or Renewable Energy Generation (MWh)		Net Greenhouse Gas Emission Savings <sup>a</sup> (Tons CO <sub>2</sub> e <sup>b</sup> )		Cost Benefit Ratio (\$/Ton CO <sub>2</sub> e)	
	Total Incentives <sup>c</sup>	Total Associated Costs <sup>d</sup>	Annual Savings <sup>e</sup>	Lifetime Savings <sup>f</sup>	Annual Savings <sup>e</sup>	Lifetime Savings <sup>f</sup>	Annual Savings <sup>e</sup>	Lifetime Savings <sup>f</sup>	\$/Ton Annual CO <sub>2</sub> e Savings <sup>e</sup>	\$/CO <sub>2</sub> e EXPECTED LIFETIME SAVINGS <sup>f</sup>
<b>Renewable Energy</b>										
NY-Sun Statewide Customer Incentives	\$50.1	\$0.00	-	-	199,497	4,987,423	115,708	2,892,705	433	17
NY-Sun Long Island SEEF Incentives	\$6.3	\$1.16	-	-	29,803	745,087	17,286	432,150	433	17
NY-Sun Long Island Incentives <sup>i</sup>	\$0.7	\$0.01	-	-	2,810	70,261	1,630	40,751	433	17
Residential PV Plus Storage	\$8.9	\$0.1	-	-	30	760	18	441	510,436	20,417
<b>Energy Efficiency</b>										
LIPA Energy Efficiency and Renewable Energy Initiative	\$60.0	-	-	-	143,763	2,587,725	83,382	1,500,881	720	40
EmPower Plus	\$98.9	\$13.0	625,822	15,019,727	8	152	45,977	1,103,407	2,436	101
Disadvantaged Communities Schools and Affordable Housing	\$16.0	\$0.5	712,528	17,100,677	-60,699	-1,092,585	6,549	368,401	2,520	45
Multifamily Low Carbon Capital Planning / Pathway Projects	\$17.3	\$2.7	761,150	18,267,591	26,041	468,736	59,707	1,342,348	335	15
Building Retrofit and New Construction Challenges	\$44.7	\$1.3	172,152	4,131,640	21,460	386,282	22,535	466,158	2,041	99
Community Thermal Energy Networks	\$9.1	\$1.6	175,000	5,250,000	-	-	10,655	319,646	1,004	33
<b>Innovative GHG Abatement Strategies</b>										
Charge NY <sup>j</sup>	\$47.1	\$21.8	5,471,894	54,718,942	-318,184	-3,181,844	432,280	4,322,796	159	16
<b>Community Clean Energy</b>										
Clean Energy Communities	\$17.4	\$0.0	5,696,698	85,450,464	963,774	14,456,611	916,131	13,741,964	19	1
Healthy New Home Design and Construction Challenges	\$12.7	\$0.4	48,839	1,172,128	6,088	109,587	6,393	132,247	2,041	99
<b>Directed</b>										
Clean Energy Fund <sup>k</sup>	\$50.4	\$13.4	34,700	550,559	3,240	53,930	3,710	550,559	1,479	116
Green Jobs - Green New York	\$73.6	\$11.1	553,213	12,723,892	70,428	1,338,126	80,993	1,699,449	998	50
<b>TOTAL Anticipated Benefits<sup>l</sup></b>	<b>\$513.2</b>	<b>\$67.1</b>	<b>14,251,995</b>	<b>88,263,120</b>	<b>98,781</b>	<b>5,786,272</b>	<b>772,722</b>	<b>12,389,884</b>	<b>711</b>	<b>47</b>

<sup>a</sup> These emission reductions are associated with both electric and fossil-fuel saving measures. Under a cap-and-invest system, the total number of emission allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, in the near term, electric efficiency projects may not decrease the overall amount of emissions going into the atmosphere. However, electric efficiency projects will reduce end users’ responsibility or footprint associated with emissions from electricity production.

<sup>b</sup> CO<sub>2</sub>e stands for carbon dioxide equivalent and describes the amount of CO<sub>2</sub> that would have the same global warming potential as a given mixture of gases based on factors published by the Intergovernmental Panel on Climate Change.

<sup>c</sup> Inclusive of incentive dollars for expenditures, encumbrances, and contract pre-encumbrances.

<sup>d</sup> Inclusive of all non-incentive expenditures.

<sup>e</sup> Inclusive of savings from all currently operational projects installed since program inception.

<sup>f</sup> Annual Savings multiplied by the lifetime of the measure installed.

Table notes continued on the next page

## Table 1 notes continued

- g The sum of Total Incentives and Total Associated Costs divided by Annual Savings.
- h The sum of Total Incentives and Total Associated Costs divided by Lifetime Savings.
- i This initiative was referred to as “NY-Sun Long Island” in previous versions of the RGGI Operating Plan and included all RGGI-funded solar programs. These programs are now presently individually in this table.
- j Net Energy Savings values represent MMBtu savings from the use of electric vehicles; the electricity required to charge the vehicles is 14,337 MWh cumulative annual and 143,366 MWh lifetime. Expected emission reductions and customer bill savings are net, including both MMBtu that add to the benefits and the electricity required to charge the electric vehicles that subtract from the benefits.
- k These figures represent a proportional allocation of benefits relative to the percent of RGGI contributions to the total approved CEF budget.
- l Totals may not sum exactly due to rounding.

The Summary of Benefits provides a quantitative estimate of the benefits associated with deployment programs. The following deployment program areas are expected to realize savings during the current plan timeframe: Long Island Power Authority (LIPA), Efficiency and Renewable Energy, Disadvantaged Communities Schools and Affordable Housing, Multifamily Low Carbon Capital Planning / Pathways Projects, Building Retrofit and New Construction Challenges, Community Thermal Energy Networks, EmPower Plus, NY-Sun solar programs, Residential, PV Plus Storage, Charge NY, Clean Energy Communities, Healthy New Home Design and Construction Challenges, Green Jobs - Green New York (GJGNY), and the Clean Energy Fund (CEF).

Estimated benefits related to the community clean energy or other research and development (R&D) initiatives are not included in benefit calculations. Nevertheless, benefits can be anticipated from these program areas, including long- and short-term job creation, economic development benefits, efficiency improvements, increased use of renewable energy, pollution prevention, abatement of fuel use, annual electric savings, and associated air emissions reductions. To the extent they are available, these benefits are described in the program description sections of this report.

For the purpose of this report, cumulative lifetime benefits have been calculated for total program investments made through December 31, 2023. Anticipated benefits over the timeline of the budget proposal have been calculated.

Benefit achievements are updated on a quarterly basis and can be found in New York State’s RGGI-Funded Programs Status Report. Visit [nyscrda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/RGGI-Reports](https://nyscrda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/RGGI-Reports) on the NYSERDA website for details.



# 1 Introduction

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## 1.1 Background

Through the Regional Greenhouse Gas Initiative (RGGI), New York State and its partner states have pioneered the nation's first market-based, cap-and-invest program to help control the carbon dioxide (CO<sub>2</sub>) emissions contributing to global climate change. Just as the RGGI program serves as a model for a national greenhouse gas (GHG) emissions reduction strategy, New York State is also creating a national model through its RGGI Operating Plan, demonstrating how strategic investments across disciplines and across the economy can support comprehensive strategies that best advance the carbon dioxide (CO<sub>2</sub>) emission reduction goals of the State.

New York State maintains a robust portfolio of clean energy programs and proceeds from the sale of RGGI CO<sub>2</sub> allowances that are used to supplement existing policies and programs. The plan is structured to result in immediate emission reductions, while building capacity for carbon emission mitigation action in the long-term. In accordance with State regulations, this plan implements activities to reduce carbon emissions and pollution through energy efficiency, renewable energy, and support for innovative carbon abatement strategies.

Deep and persistent emission reductions will require changes in the energy consumption patterns of businesses and individuals as well as systemic changes in all sectors of the economy, including buildings and industrial processes, transportation, and power generation. Systemic changes will result from expanding partnerships with industries, education and outreach campaigns to generate clean energy demand from consumers, and continuation of sound government policy to achieve clean energy and emission reduction goals.

To realize both immediate GHG emission reductions as well as create the needed platforms for long-term, self-sustaining changes in energy consumption patterns, the RGGI portfolio of programs strive for the following:

- Provide substantial benefits to consumers and the environment, resulting in GHG emission reductions from both electricity and other energy sources. By deploying a range of energy efficiency and renewable energy technologies, New York State can realize GHG emissions reductions in the near-term and provide valuable information to consumers and supply-chain participants for self-sustaining markets in these activities.
- Empower communities to make decisions about energy usage that will lead to lower GHG emissions as well as economic and societal co-benefits. By supporting sustainability planning and

implementation of those plans, communities and individuals can guide decision-making that improves localities and simultaneously reduce statewide GHG emissions.

- Employ innovative approaches to increase the adoption of clean energy alternatives in New York State. By using new financing strategies or program approaches targeting specific uses, the portfolio creates an opportunity to increase penetration of existing programs and expands the reach of clean energy programs to communities that may not have historically taken advantage of these options.
- Stimulate new technology development and create a strong clean energy business environment. By supporting entrepreneurial growth, RGGI can advance new economic development strategies for New York State that help to expand the economy and support innovative State products and services that can be exported across the country or around the world.
- Build capacity for long-term GHG reduction. By training workers and partnering with industry, the RGGI program portfolio enables transformative activities through implementation of carbon-reducing projects.

The use of RGGI funds complements activities articulated by Clean Energy Fund (CEF) investment plans. RGGI-funded programs create synergies with existing efficiency and clean energy programs, and furthermore, advance the stated RGGI policies and intended outcomes. The statewide goals of reduced GHG emissions, reduced energy use, accelerated growth in the State’s clean energy economy, increased energy efficiency, increased fuel diversity (measured by the overall proportion of renewable electricity generation), reduced criteria pollution and low-income home weatherization are, therefore, enhanced by these complementary resources. As such, the plan is not designed as a standalone portfolio of program activities, nor are RGGI proceeds relied on as a sole source to achieve the State’s carbon mitigation goals. Rather, the plan should be considered in context of the other policies and programs that help reduce GHG emissions and has been designed to strengthen and enhance the comprehensive statewide energy policy to best leverage the State’s collective resources to achieve its clean energy goals. In short, RGGI will continue to complement NYSERDA’s future program activities aimed at reducing GHG emissions in New York State.

Building from the 2024 RGGI Operating Plan Amendment, this plan incorporates feedback and direction received during public stakeholder meetings in December 2023 and subsequent written comments from stakeholders. The scope and approach for allocating the anticipated proceeds was approved by NYSERDA’s Board of Directors in January 2024. Overall, the plan covers program investments comprised of the following RGGI funds:

- Anticipated proceeds from auctions to be held during fiscal years 2024–27
- Remaining program funds from prior auction proceeds

The use of previously obtained proceeds that comprise remaining program funds was approved by the board at earlier meetings.

## 1.2 Regulatory Context

RGGI is a multi-state cooperative effort to reduce GHG emissions from electric power plants by means of a cap-and-invest system. Under RGGI, the participating states designed cap-and-invest programs that set limits on CO<sub>2</sub> emissions from the regulated power plants in participating states. Over time, the cap declines so that CO<sub>2</sub> emissions from the power sector subsequently decrease.

The RGGI participating states complete periodic program reviews that include a comprehensive evaluation of program success, program impacts, additional reductions, imports and emission leakage, and offsets. The first regional RGGI Program Review was completed in early 2013 and in December 2017 the participating states completed a second regional program review resulting in updated Model Rule.<sup>1</sup> A third program review began in Summer 2021, whereby the participating states set out to conduct technical analyses to inform decision-making related to core Program Review topics (i.e., the regional CO<sub>2</sub> emission cap), solicit input from stakeholders and general public on key aspects of the Program Review process (i.e., timeline, core topics and objectives, modeling assumptions and results, and other policy and design considerations), as well as convene independent learning sessions with experts and other interested parties on key design elements. Activities for the third program review are anticipated to conclude on or about Winter 2024-2025.

Each state is implementing this initiative through individual CO<sub>2</sub> Budget Trading Programs linked through the regional cap-and-invest program. Visit <http://www.rggi.org> for additional background on the initiative.

In New York State, the RGGI Program has been implemented through two complementary programs: The New York State Department of Environmental Conservation (DEC) established New York State's CO<sub>2</sub> Budget Trading Program (6 NYCRR Part 242, 6 NYCRR Part 200, General Provisions) and NYSERDA established the CO<sub>2</sub> Allowance Auction Program (21 NYCRR Part 507).

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<sup>1</sup> Visit [https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model\\_Rule\\_2017\\_12\\_19.pdf](https://www.rggi.org/sites/default/files/Uploads/Program-Review/12-19-2017/Model_Rule_2017_12_19.pdf) for more information.

The CO<sub>2</sub> Allowance Auction Program established the rules through which New York State will sell most of its CO<sub>2</sub> allowances. The CO<sub>2</sub> Allowance Auction Program [21 NYCRR Part 507.4(d)] also creates the parameters for use of the proceeds from the sale of allowances that will be used to “promote and implement programs for energy efficiency, renewable or non-carbon emitting technologies, and innovative carbon emissions abatement technologies with significant carbon reduction potential.” The plan is designed to be consistent with these regulatory requirements.

### **1.3 Program Goals**

New York State invests RGGI proceeds to support comprehensive strategies that best achieve the RGGI CO<sub>2</sub> emission reduction goals, which reduce global climate change and pollution through energy efficiency, renewable energy, and carbon abatement technology. Investments will be focused on a complementary mix of electricity-related GHG reduction opportunities and technologies as well as strategies for reductions related to the use of petroleum and natural gas.

Deploying commercially available renewable energy and energy efficiency technologies helps to reduce GHG emissions in the short term. To move the State toward a more sustainable future, RGGI-funded programs work to empower communities to make decisions about energy usage that lead to lower carbon emissions as well as economic and societal co-benefits.

The Climate Leadership and Community Protection Act (Climate Act), signed into law in July 2019, charts a course for New York State to 85% greenhouse gas emissions reduction by 2050, a pathway to a carbon neutral economy, and a goal that 40% of the benefits from investments in clean energy and energy efficiency be realized by disadvantaged communities. This Operating Plan estimates<sup>2</sup> that 42% of commitments from January 2020 through this Plan period are expected to provide benefits to disadvantaged communities based on an interim definition of disadvantaged communities and low-to-moderate-income investments, as the Climate Justice Working Group completes its work to finalize statewide disadvantaged communities criteria.

Funds will also be used to induce additional GHG reductions by establishing the commitments and capacity to curtail GHGs by municipal, institutional, and other public and private sector participants.

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<sup>2</sup> Estimated benefits only coincide with the timeframe reported. Future benefits could be higher or lower.

## 1.4 Program Focus and Geographic Scope

RGGI funds have historically been used to support programs ineligible for funding from other sources. Similarly, today RGGI-funded activities complement and enhance CEF initiatives.<sup>3</sup>

Geographic equity of expenditures and benefits will be pursued across the portfolio of programs; however, not on a program-by-program basis. Certain programs may have a limited geographic focus, but most will be statewide in scope. Outreach activities may be tailored to different regions. Program monitoring and evaluation may lead to adjustments in offerings, such as changes in incentive levels.

## 1.5 Portfolio Development Criteria

The following criteria were considered in developing the portfolio of programs included in the plan:

- Cost-effectiveness measured by tons of carbon dioxide equivalence reduced per dollar invested.
- Long-range potential for the technology or investment to reduce GHG emissions in New York State.
- Potential to reduce the costs of achieving the RGGI emissions cap.
- Other benefits for New York State such as job creation, leveraging of capital investment to promote economic development, providing health and environmental co-benefits, and enhancing municipal capacity to further reduce GHG emissions.
- Opportunities to reduce the disproportionate cost burden and environmental impacts on low-income families and environmental justice communities.
- Need for funds based upon availability from other funding sources.

These criteria served as guidance for the development of the overall portfolio of programs. They are not weighted; rather, the intention is to qualitatively achieve a strong balance of programs. Furthermore, the minimum or “critical mass” funding level needed to run an effective program is also an important consideration. The diverse portfolio of initiatives presented in the plan will balance the achievement of near-term results with the investment in long-term strategies that will provide sustained, ongoing reductions of GHGs.

Consistent with Part 242-10.3(d)(3), projects that receive funds under a program covered in the plan are not eligible to pursue CO<sub>2</sub> Emissions Offset credits under the CO<sub>2</sub> Budget Trading Program, with the

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<sup>3</sup> Visit <http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FC3FBD53-FBAC-41FB-A40E-3DA0A5E0866A}> for NYSERDA’s CEF supplement.

exception of agricultural methane projects. All entities, including compliance entities, may pursue projects under any of the proposed programs in the plan.

## 2 Overview of Program Funding

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This section provides an overview of program funding. Funds available for investment or commitment during the planning period described in this plan are comprised of two components:

- Estimated future proceeds from fiscal years 2025–27
- Remaining program funds

### 2.1 Assumptions about Auction Proceeds for Operating Plan

Estimated auction proceeds for fiscal years 2025–27 are anticipated to total approximately \$800 million. For planning purposes, this Operating Plan maintains the future auction proceeds based on an auction allowance price of \$12.32, which is sustained through the end of the planning period and is based on a lookback average of recent auctions.

### 2.2 Summary of Proceeds Investment by Program

Table 2 provides a summary of proceeds investment by program and shows how the approximately \$3,070 million of funds expected to be made available through RGGI auctions have been, or will be, allocated among programs and other costs through fiscal year 2027.

The table shows cumulative allocations through March 2023 and reflects the planned and actual allocations for fiscal years 2025–2027. The table also summarizes the allocation of all current and planned proceeds through March 31, 2027.

**Table 2. RGGI Revenue and Funding Allocation Plan**

Category	Program	Cumulative Allocations through March 31, 2024	FY24-25 Plan	FY25-26 Plan	FY26-27 Plan	Cumulative Allocations through March 31, 2027
Proceeds	Number of allowances	476,393,995	19,163,256	19,440,617	22,033,683	537,031,550
	Allowance price	\$4.69	\$12.32	\$12.32	\$12.32	\$5.55
	RGGI Auction Proceeds	2,233,674,017	236,091,314	239,508,395	271,454,971	2,980,728,698
	Interest Earnings	36,601,125	19,542,000	17,555,000	15,918,000	89,616,125
	<b>Total Revenues</b>	<b>2,270,275,142</b>	<b>255,633,314</b>	<b>257,063,395</b>	<b>287,372,971</b>	<b>3,070,344,823</b>
Renewable Energy	NY-Sun Statewide Customer Incentives	36,970,000	20,000,000	17,850,000	9,000,000	83,820,000
	NY-Sun Long Island SEEF Incentives	7,500,000	1,000,000	3,000,000	1,000,000	12,500,000
	NY SUN Long Island incentives	55,000,000	-	-	-	55,000,000
	Residential PV Plus Storage	6,000,000	3,000,000	-	-	9,000,000
	Renewable Heat NY	10,300,083	-	-	-	10,300,083
	Agrivoltaics	5,000,000	5,000,000	7,000,000	10,000,000	27,000,000
	Advanced Renewable Energy	2,837,698	-	-	-	2,837,698
	NYS Generation Attributes Tracking System	789,933	-	-	-	789,933
	NYSERDA PV incentives	5,319,821	-	-	-	5,319,821
Energy Efficiency	Clean Energy Workforce Opportunity Program	15,000,000	-	-	-	15,000,000
	LIPA Efficiency and RE	289,600,000	20,000,000	20,000,000	20,000,000	349,600,000
	Energy Storage (LIPA territory)	12,926,434	-	-	-	12,926,434
	EmPower Plus	101,475,905	30,000,000	45,000,000	30,000,000	206,475,905
	Pilot Projects with Municipal Utilities	3,000,000	-	-	-	3,000,000
	Disadvantaged Communities Schools / Buildings	42,900,000	6,500,000	5,000,000	5,000,000	59,400,000
	Multifamily Low Carbon Capital Planning / Pathway Projects	5,000,000	3,000,000	7,000,000	10,000,000	25,000,000
	Community Thermal Energy Networks	12,700,000	3,000,000	4,000,000	2,000,000	21,700,000
	Building Retrofit and New Construction Challenges	10,000,000	10,000,000	18,000,000	18,000,000	56,000,000
	Climate Resiliency Implementation Planning	5,000,000	5,000,000	5,000,000	5,000,000	20,000,000
	Support for 2 Million Homes Goal	-	-	15,000,000	10,000,000	25,000,000
	Multifamily Performance Program	15,046,683	-	-	-	15,046,683
	Multifamily Carbon Emissions Reduction	5,833,019	-	-	-	5,833,019
	Solar Thermal incentive	4,226,947	-	-	-	4,226,947
	Municipal Water/Wastewater	1,245,242	-	-	-	1,245,242
	Innovative Finance & Risk Management	-	-	3,000,000	3,000,000	6,000,000
	Clean Heat Consortium	-	2,500,000	4,500,000	5,000,000	12,000,000
	Green Residential Buildings	2,744,601	-	-	-	2,744,601
Innovative GHG Abatement Strategies	Southern Tier Competition (76 West)	11,000,000	-	-	-	11,000,000
	Brookhaven National Lab- ION Collider	25,000,000	-	-	-	25,000,000
	Electric Vehicle/Charge NY	125,400,000	45,900,000	40,000,000	40,000,000	251,300,000
	Advanced Buildings & Industrial Innovations	13,307,654	-	-	-	13,307,654
	Climate Research & Analysis	8,729,296	-	-	-	8,729,296
	Competitive GHG Reduction Pilot	972,650	-	-	-	972,650



**Table 2 continued**

<b>Category</b>	<b>Program</b>	<b>Cumulative Allocations through March 31, 2023</b>	<b>FY23-24 Plan</b>	<b>FY24-25 Plan</b>	<b>FY25-26 Plan</b>	<b>Cumulative Allocations through March 31, 2026</b>
<b>Innovative GHG Abatement Strategies (continued)</b>	Clean Energy Business Development	5,809,987	5,400,000	-	-	11,209,987
	Transportation Research	3,819,311	-	-	-	3,819,311
	Natural Carbon Solutions	5,000,000	2,000,000	2,000,000	3,000,000	12,000,000
	Equity and Climate Transformation Research	1,700,000	900,000	-	-	2,600,000
	Climate Mitigation and Resilience Research	1,500,000	-	-	-	1,500,000
	Scoping Plan Implementation Research	5,000,000	5,000,000	5,000,000	5,000,000	20,000,000
	Hydrogen Hubs	5,000,000	-	-	-	5,000,000
	PV Manufacturing consortium	8,480,000	-	-	-	8,480,000
	Carbon Sequestration	1,000,000	-	-	-	1,000,000
	<b>Community Clean Energy</b>	Cleaner Greener Communities	94,261,895	(4,900,000)	-	-
Clean Energy Communities		13,273,120	3,000,000	2,000,000	2,000,000	20,273,120
Climate Smart Communities		7,674,999	-	-	-	7,674,999
Community Energy Engagement		1,400,000	-	-	-	1,400,000
Economic Development Growth Extension		5,843,047	-	-	-	5,843,047
Energy to Lead		3,000,000	-	-	-	3,000,000
Renewable/Net-Zero Energy Demonstrations		7,500,000	-	-	-	7,500,000
Healthy New Home Design & Construction Challenge		4,050,000	3,000,000	3,000,000	3,000,000	13,050,000
Clean Energy Workforce Development		30,000,000	19,000,000	15,000,000	20,000,000	84,000,000
Clean Energy Hubs		13,700,000	3,000,000	6,000,000	6,000,000	28,700,000
Climate Action Consumer Awareness & Education		7,500,000	5,000,000	4,500,000	4,500,000	21,500,000
Air Monitoring		8,000,000	-	-	-	8,000,000
Regional Economic Development & GHG Reduction		10,246,443	-	-	-	10,246,443
<b>CEF</b>		Transfer to(from) Clean Energy Fund	208,226,804	22,000,000	19,773,196	-
<b>Directed</b>	NYS Environmental Tax Credits	179,000,000	-	-	-	179,000,000
	NYS Environmental Protection Fund	20,000,000	5,000,000	5,000,000	5,000,000	35,000,000
	Electric Generation Facility Cessation Mitigation	50,842,000	1,000,000	8,000,000	14,158,000	74,000,000
	Green Jobs-Green NY- Original Legislation	112,000,000	-	-	-	112,000,000
	Green Jobs-Green NY- Additional Funding	198,962,809	14,800,560	16,500,000	20,000,000	250,263,369
	Transfer to Clean Energy Standard	719,424	-	-	-	719,424
	NYS Budget Transfer	90,000,000	-	-	-	90,000,000
	Federal Program Match Opportunities	50,000,000	29,000,000	30,000,000	21,664,544	130,664,544

**Table 2 continued**

Category	Program	Cumulative Allocations through March 31, 2024	FY24-25 Plan	FY25-26 Plan	FY26-27 Plan	Cumulative Allocations through March 31, 2027
Administration and Other Non-Program Costs	Program Administration	76,396,359	21,321,667	21,321,667	21,321,667	140,361,359
	Program Evaluation	12,155,429	2,000,000	2,000,000	3,000,000	19,155,429
	Commensurate Benefit/Litigation reserve	21,900,366	-	-	-	21,900,366
	RGGI Inc Startup Costs	1,598,204	-	-	-	1,598,204
	RGGI Inc pro-rata costs	11,658,667	825,000	825,000	825,000	14,133,667
	State Cost Recovery	19,843,146	2,360,913	2,395,084	2,714,550	27,313,693
<b>Total Funding Allocations</b>		<b>2,137,887,976</b>	<b>294,608,140</b>	<b>337,664,947</b>	<b>300,183,760</b>	<b>3,070,344,823</b>
Surplus/(Shortfall)		132,387,166	(38,974,826)	(80,601,551)	(12,810,789)	0
<b>Cumulative Surplus (Shortfall)</b>		<b>300,118,582</b>	<b>93,412,340</b>	<b>12,810,789</b>	<b>0</b>	<b>0</b>

### 2.2.1 Program Funding Expansion Plan and Additional Funds

The RGGI Operating Plan Amendment addresses the potential for auction revenues to exceed the estimates being used to develop the operating plan for each year. Allowance auction proceeds may exceed the revenue estimates presented in this multiyear operating plan. Absent unforeseen circumstances, if additional revenue should become available, proceeds could be used to reduce deficits or expand funding for the existing portfolio of RGGI programs to the extent consistent with Part 242, the CO<sub>2</sub> Budget Trading Program regulation. Changes in actual program funding as a result of fluctuating auction revenues are accounted for in the RGGI Quarterly Program Status Reports. Visit [nyserdera.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/RGGI-Reports](https://nyserdera.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/RGGI-Reports) on the NYSERDA’s website for details.

The ensuing sections of the report provide the following information for each program anticipated to have program investments:

- Program Description
- Benefits resulting from program investments (measures of program benefits)

### 2.2.2 Other Fees and Expenses

Additional information about other fees and expenses that are netted out from total auction proceeds are also shown and described in Table 2.

### **2.2.3 Repayment of System Benefits Charge Funds**

The Public Service Commission issued an Order in Case 05-M-0090, dated August 27, 2007 authorizing up to \$3 million of interest earnings from unexpended System Benefits Charge (SBC) funds to be used to finance certain start-up costs of RGGI, Inc., subject to reimbursement of the SBC account. In October 2009, reimbursement of approximately \$1.6 million was made to the SBC account, which represented the amount of funds used to finance these start-up costs plus interest.

### **2.2.4 Ongoing New York Share of RGGI, Inc. Costs**

RGGI, Inc. is a nonprofit corporation created to support development and implementation of CO<sub>2</sub> Budget Trading Programs in New York and other participating states. NYSERDA entered into an agreement for RGGI, Inc. to provide technical and support services for key elements of New York State's CO<sub>2</sub> Budget Trading program that include the following:

- Develop and maintain a system to report data from emissions sources subject to RGGI and to track allowances
- Implement a platform to auction CO<sub>2</sub> allowances
- Monitor the market related to the auction and trading of CO<sub>2</sub> allowances
- Provide technical assistance to the participating states in reviewing applications for emission offset projects
- Create and implement a market monitoring program
- Provide technical assistance to the participating states to evaluate proposed changes to the states' RGGI programs

New York State's share of RGGI, Inc. costs was estimated to be approximately \$825,000 per year during the planning period. This estimate is consistent with the New York's portion of the annual operating budgets approved by the RGGI, Inc. Board of Directors for 2022 and 2023.

### **2.2.5 State Cost Recovery Fee**

NYSERDA assessed an annual State Cost Recovery Fee pursuant to Section 2975 of the Public Authorities Law to help support general governmental services provided to NYSERDA. The fee is assessed on all NYSERDA revenues, and NYSERDA allocates this obligation proportionately among all programs and funding sources. The RGGI budget includes an estimate based on the current annual assessment of the fee expected to be allocated to the RGGI funded programs.

## **2.2.6 Other Budget Components**

On December 4, 2009, New York State enacted deficit reduction measures that included the transfer of \$90 million in RGGI auction proceeds to the general fund. These actions were taken to improve New York State's long-term fiscal health.

## **2.2.7 Program Evaluation and Administration**

Program evaluation and administration costs have been budgeted for fiscal years 2023–2026 at approximately \$2 million and \$16.5 million, respectively. This amount reflects the projected funds required to support the continued management of projects from past initiatives, new program activity, and increasing levels of complexity and skills required to transform markets and understand and address needs of disadvantaged communities. This total translates to approximately 8% of the total funding allocations for the planning period, well under best practice benchmarks for general and administrative expenses.

## 3 Program Descriptions and Accomplishments

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### 3.1 Renewable Energy

#### 3.1.1 Renewable Heat NY

The Renewable Heat NY initiative was a long-term commitment to support the high-efficiency, low-emission, biomass heating industry. Renewable Heat NY program funding was fully allocated in August 2021 and the program stopped accepting new project applications. All pellet stove and small biomass boiler projects are complete and one large commercial pellet boiler project is undergoing commissioning and will be complete in 2023. The long-term market development strategy for Renewable Heat NY included the following objectives:

- Raise consumer awareness.
- Develop large-scale anchor customers to expand the wood pellet bulk delivery market.
- Promote supply chain development, including workforce training and support for product development, manufacturing, laboratory and field testing, and equipment certification.
- Leverage NYSERDA's issuance of the New York State Wood Heat Report to accelerate the use of biomass for heating, using the most efficient low-emission technologies.
- Provide financial incentives to consumers for advanced efficiency and low-emission technologies to reduce upfront costs.
- Provide support so that sustainable forestry practices are available and followed by small and large landowners.

This initiative sought to develop and expand local clusters of activity, thereby meeting the overarching goal of supporting the high-efficiency and low-emission biomass heating industry in the State. Renewable Heat NY provided supply chain and service network development (i.e., workforce development, training, and research and development), along with consumer incentives and financing. NYSERDA is developing a report that summarizes the results of the Renewable Heat NY program, which is expected in early 2024.

A market evaluation of the Renewable Heat NY program was completed in the third quarter of 2020. For more information on this evaluation please refer to section F.2. Completed Evaluations in the appendix of this report. The report is available on the NYSERDA website.<sup>1</sup>

After the Renewable Heat NY program funding was fully allocated in August 2021, pellet stove incentives for income-eligible customers were transitioned to NYSERDA's low- to moderate-income residential programs.

### **3.1.2 NY-Sun Initiative**

The NY-Sun initiative is driving the growth of the solar industry and makes solar technology more affordable for all New Yorkers. The program provides declining incentives for the installation of systems and works to reduce solar electric balance-of-system costs through technology advancements, streamlined processes, and customer aggregation models. The goal is to achieve a sustainable solar industry that does not depend on incentives.

In August 2014, NY-Sun became a statewide program. RGGI funding enabled the participation of customers from the Long Island Power Authority (LIPA), New York Power Authority (NYPA), and municipal power companies. NY-Sun supports end-use solar installations for commercial, industrial, and residential customers as well as electric utility applications to improve the performance of distribution circuits and reduce peak electric load in critical load pockets. These projects assist New York State communities that empower clean energy, healthy communities, and economic development.

RGGI funding supports the following NY-Sun programs:

- NY-Sun Statewide Customer Incentives – for customers of municipal power companies and NYPA
- NY-Sun Long Island Incentives – for commercial and residential LIPA customers
- NY-Sun Long Island SEEF Incentives – the Solar Energy Equity Framework (SEEF) supports the development of community-led solar projects serving low-to-moderate income households as well as regulated multifamily and affordable housing properties on Long Island

### **3.1.3 NYSERDA Solar Electric Program**

NYSERDA's Solar Electric Program focuses on reducing GHG emissions in the long term by helping to establish a sustainable market for solar energy statewide that includes targeted financial incentives. These RGGI funds supplement and do not supplant Renewable Portfolio Standard (RPS) funds, supporting installation of systems in regions that do not pay into the RPS.

### **3.1.4 Residential PV Plus Storage**

The Residential PV Plus Storage program will provide incentives to new and existing residential solar projects coupled with new energy storage. The program is expected to deliver 2,000 - 3,000 residential storage systems over more than two years, totaling around 10 MW of storage. Similar to the current offering on Long Island, the rest of state engagement is anticipated to leverage utilities by region. These storage projects will provide renewable resource integration, peak power support to the utility (e.g., virtual power plants, dynamic load management, other), with resiliency and clean power to homeowners.

### **3.1.5 New York Generation Attribute Tracking**

NYSERDA established the New York Generation Attribute Tracking System (NYGATS) to record electricity generation attribute information in New York State as well as to process such information from energy imported and consumed as a basis for creating tradable generation attribute certificates. Through NYGATS, entities are able to verify and substantiate ownership of renewable energy certificates to either (1) support regulatory compliance, (2) validate environmental attributes in trading markets, or (3) substantiate the fulfillment and verification of voluntary green market product claims. NYGATS also characterizes the attributes of electricity imports and exports and has the capability to interface and exchange information with other certificate tracking systems. The system is used for (1) the creation of annual disclosure labels for New York Load Serving Entities (LSE) under the Environmental Disclosure Program (EDP), (2) generation projects to apply for eligibility under Tier 1 of the Clean Energy Standard (CES), (3) LSEs to substantiate compliance under the CES, and (4) CES progress reporting. Additionally, NYGATS certificates are the instrument to be received by the utilities in exchange for providing the environmental value component of the Value of Distributed Energy Resources (VDER) Phase 1 Value Stack tariff. As previously ordered by the Public Service Commission (PSC), this project is also supported with System Benefits Charge (SBC) environmental disclosure program funding. This program is now closed.

### **3.1.6 Agrivoltaics**

The Agrivoltaics program aims to advance the technological, economic, and agricultural viability of solar energy technologies responsibly co-located within active farmland. Demonstration projects results would inform NYSERDA renewable energy procurement strategies, state renewable energy incentive programs, and solar development permitting. Through partnerships with academia and industry, NYSERDA would advance research and market development of agrivoltaic technologies. Through collaboration with

agricultural commodity experts, NYSERDA would identify and expand markets for commodities produced via agrivoltaic deployment.

### **3.1.7 Advanced Renewable Energy Program**

The Advanced Renewable Energy Program supports projects that foster the market introduction of a broad range of promising new and advanced renewable energy technologies, including advanced biomass, tidal, and offshore wind technologies.

## **3.2 Energy Efficiency / Building Electrification**

### **3.2.1 LIPA Energy Efficiency and Renewable Energy Initiative**

The RGGI funds provided to the Long Island Power Authority (LIPA) ensure that businesses and consumers on Long Island have access to similar clean energy and energy efficiency opportunities that are available throughout the State and to help advance statewide efforts toward achieving the clean energy goals of the 2015 New York State Energy Plan. The funds provided to LIPA have traditionally supported solar incentive programs consistent with the statewide NY-Sun program but have more recently supported energy efficiency programs administered by PSEG Long Island (PSEGLI). In 2016, LIPA, NYSERDA, and PSEGLI collaborated to launch new approaches envisioned under Reforming the Energy Vision (REV) to support market transformation objectives, while also achieving greater carbon emission reductions. Funding and reporting requirements are established through a memorandum of understanding (MOU) between NYSERDA and LIPA. The largest portion of the spending typically consists of payments to businesses through PSEGLI's Commercial Efficiency Program (CEP). PSEGLI's Home Comfort central air conditioner program and PSEGLI's Efficient Products program were among the residential programs that were supported. The Efficient Products program includes support of LED light bulbs, pool pumps, appliance recycling and room air conditioners

PSEGLI has implemented several initiatives in support of New York State's clean energy goals. Long Island has been recognized as the first region of the State where all 18 Clean Energy Community grant awards have been claimed, with each community earning the designation as a Clean Energy Community. PSEG Long Island will continue to coordinate with NYSERDA around supporting communities by promoting the grant projects that will result from these awards. In support of statewide goals related to beneficial electrification, PSEG Long Island has focused on cold climate heat pump solutions for residential and commercial customers. Additionally, the Home Energy Management program was launched in the third quarter of 2017. The program consists of Home Energy Reports that are sent to



440,000 residential customers and an interactive portal which provides a disaggregation of electric usage and savings tips. The program was enhanced in the fourth quarter of 2017 to include a Home Energy Analyzer which is open to all residential customers to input home profile information for a customized energy plan. Additionally, the online Marketplace, which offers customers a variety of energy efficiency products, has been enhanced to include the sale of electric vehicle chargers.

### **3.2.2 Multifamily Performance Program**

The Multifamily Performance Program (MPP) serves residential buildings with five or more units. Funds are targeted at efficiency measures that help to reduce on-site oil, non-firm natural gas, steam, and propane energy demand in multiunit residential buildings. All buildings receive program support for energy assessments to determine cost-effective measures, expected energy savings, and installation costs. Projects also receive implementation incentives to support the installation of measures identified by program supported assessments. This program is now closed.

### **3.2.3 Multifamily Carbon Emission Reduction Program**

The Multifamily Carbon Emissions Reduction Program (MCERP) provided financial assistance and technical support to owners of multifamily buildings converting their heating systems from #6 fuel oil to cleaner fuel alternatives. Less carbon-intensive fuels include ultra-low sulfur #2 fuel oil, biodiesel and biodiesel blends, natural gas, and renewable energy (geothermal and solar thermal). MCERP was positioned to encourage early adoption of New York City's phase-out of #6 oil and, as such, has contributed to an overall improvement in NYC's air quality. Converting #6 fuel oil-heated buildings to cleaner fuels reduces carbon emissions, improves air quality, and produces positive public health benefits. Citywide conversions have resulted in 69% reductions in airborne sulfur dioxide and 23% reductions in soot concentrations. These benefits are concentrated in low-income areas of NYC, where poor air quality leads to higher rates of asthma and other respiratory illnesses, especially in children and the elderly. This program is now closed.

### **3.2.4 EmPower Plus**

EmPower Plus combines two combines NYSERDA's EmPower New York (EmPower) program with the Home Performance with ENERGY STAR programs. EmPower offers no-cost energy efficiency services to low-income (i.e., HEAP-eligible) homeowners and renters. These services include electric reduction and home performance measures such as appliance replacement, energy-efficient lighting, insulation, and air sealing. On-site energy education offers customers additional strategies for managing their energy costs. Participating contractors with certifications for the work they are performing provide services. Historically, EmPower used RGGI funding to serve low-income applicants that heat with oil and propane and were ineligible for EEPS funding. Currently, RGGI funds continue to support petroleum fuel-efficiency measures in households served by municipal electric utilities. These energy efficiency measures aid in the reduction of GHG emissions and provide long-term carbon reductions.

Home Performance with ENERGY STAR (HPwES) is a comprehensive energy efficiency services program for existing one- to four-family homes and low-rise<sup>2</sup> residential buildings. On December 31, 2019, the market rate component of HPwES was sunset; however, the moderate rate component of HPwES, Assisted Home Performance with ENERGY STAR (AHPwES), which serves homeowners with

incomes less than 80% of area median income, remains an active program offering. The program uses a network of certified contractors to (1) perform diagnostic testing on the home, (2) recommend improvements, (3) determine the payback period for those improvements, and (3) install improvements selected by the homeowner. The program uses RGGI funds for municipal electric households for oil and propane efficiency measures, such as replacing inefficient oil and propane heating equipment, air sealing, insulation, and other measures that have a direct impact on reducing GHG emissions from oil and propane consumption. Income-qualified homeowners are eligible for incentives to make energy improvements. AHPwES applicants may also qualify for GJGNY assessment and financing programs.

### **3.2.5 Green Residential Buildings Program**

The Green Residential Building Program (GRBP), established under Public Authorities Law 1872, was a market transformation initiative designed to change the building practices of the residential construction industry for single-family homes and multifamily homes with up to 11 dwelling units. The GRBP offered incentives to owners who obtain a certification stating that their newly constructed residences meet or exceed Leadership in Energy and Environmental Design (LEED®) or National Green Building Standard guidelines, as well as other GRBP program-specific energy efficiency and health and safety requirements. Buildings that meet GRBP requirements will help reduce energy use and GHG emissions, save water and other natural resources, use sustainable building materials, reduce waste, and improve indoor air quality. Sixty-nine contractors participated in this program. Per the enabling law, the application deadline was October 31, 2013; therefore, the program is now closed to new applications. The following data represent only those projects in which RGGI funded the incentive, representing 82% of the program activity. This program is now closed.

### **3.2.6 Solar Thermal Incentive Program**

NYSERDA's Solar Thermal Incentive Program incentivizes the installation of solar thermal technologies to produce hot water to displace electric heated hot water systems. Approximately 100 contractors participate in this program. While funding from the Renewable Portfolio Standard (RPS) program displaces electrically heated domestic hot water, RGGI support for the Solar Thermal Incentive Program encourages the use of heating fuels other than electricity. GJGNY financing is also available for these projects. The revised program, released on March 20, 2015, provides cash incentives for the installation of new solar thermal (hot water) systems by an eligible installer or contractor. Incentives are available on a first-come, first-served basis. Incentives are applied to the total project cost based on displaced kilowatt hours. The program allows combination systems (systems that provide domestic hot water and space

heating); however, incentives are only provided on the portion of the solar thermal system output that offsets hot water production. This program is now closed.

### **3.2.7 Municipal Water and Wastewater Program**

The Municipal Water and Wastewater Program provided a unique opportunity to coordinate RGGI climate change goals and funding with American Recovery and Reinvestment Act (ARRA) along with the United States Environmental Protection Agency (EPA) goals and funding, while installing infrastructure to improve the environment and keep NYS waters clean and healthy. This program was co-managed by the NYS Environmental Facilities Corporation (EFC) and NYSERDA. EFC secured ARRA and Green Project Reserve funds from the EPA to bolster efforts to finance wastewater infrastructure via the Clean Water State Revolving Fund program. Wastewater plants installed through the program are energy efficient, thus minimizing carbon emissions and improving their economic and environmental performance. Selected projects received RGGI-funded technical analyses to identify costs and savings associated with energy efficiency, process improvement, and carbon abatement opportunities in support of EPA-funded grants and financing for plant upgrades. The program was one of five national recipients of the States Stepping Forward Program Award for excellence by the American Council for an Energy-Efficient Economy. This program is now closed

### **3.2.8 Community Thermal Energy Networks**

While heat pump technology has become a proven decarbonization solution, providing buildings with clean thermal energy for space heating, cooling, and domestic hot water. Existing heat pump programs to date have targeted customers on an individual building-by-building basis, but community heat pump systems use a network of pipes to share water heating among a cluster of buildings. RGGI funds will be used to implement community heat pumps systems as part of a statewide program. This program will also provide support for systems in State and local government facilities, as well as Affordable Housing Developments. A community-based program will develop the infrastructure for larger-scale distribution and accelerate the deployment of heat pump systems across the State.

### **3.2.9 Pilot Projects with Municipal Utilities**

This program provides funding to support the rapid decarbonization and increased resilience of municipal utilities and rural electric cooperatives given their foundational role within communities.

### **3.2.10 Disadvantaged Communities Schools/Buildings**

This program will fund high-performance energy efficiency and electrification in affordable housing. NYSERDA has partnerships in place with NYS Homes and Community Renewal (HCR), NYC Housing Preservation and Development (HPD), and the New York City Housing Authority (NYCHA) and will continue supporting decarbonization projects with these agencies. In particular, this program will allow (1) HCR-regulated affordable housing located in non-SBC territories, including municipal electric territory or Long Island, to access building decarbonization grant funding as part of HCR's financing processes and (2) provide training, technical assistance, and strategic planning resources to support NYC HPD's development of a long-term, portfolio-wide decarbonization strategy. Additionally, this initiative will support work with public housing authorities, like NYCHA, to decarbonize building with an emphasis on advancing packaged heat pump systems to develop clean heat for all.

### **3.2.11 Multifamily Low Carbon Capital Planning / Pathway Projects**

RGGI funding provides additional support for projects participating in the Low Carbon Capital Planning (LCCP) and Low Carbon Pathways (Pathways) programs, which will enable more building electrification throughout the state. LCCP offers a 75% cost share for building and portfolio-level energy studies that include an assessment of electrification and electrification-ready measures informing building owners about the actionable steps they can take to prepare their buildings for electrification. Pathways program provides incentives for building owners that install a package of measures resulting in reduction of on-site carbon emissions.

### **3.2.12 Building Retrofit and New Construction Challenges**

RGGI funding under this program is used to build upon the success of key NYSERDA initiatives such as Buildings of Excellence, the Carbon Challenge, and the Empire Building Challenge. These initiatives are competitive challenges pursuing exemplary design and high performance for new construction buildings. NYSERDA's investments provide funding to leverage design professionals and new technical solutions to create economically viable pathways for replicable approaches to removing emissions from existing commercial and industrial buildings and the design and construction of new buildings.

### **3.2.13 Climate Resiliency Implementation Planning**

This program is supporting research and analysis to perform a climate change risk assessment for clean energy and electrification assets and investments to help ensure they will remain durable solutions over time. It also includes the research and development of NYS Climate Resiliency Design Guidelines in

conjunction with DEC and OGS. This work will ensure that New York State begins to develop a clear roadmap for integrating climate risks as per Executive Order 22 (signed September 20, 2022) and the Climate Act Scoping Plan.

### **3.2.14 Innovative Finance and Risk Management**

The Innovative Finance and Risk Management program supports applied demonstrations of insurance product prototypes complementing the current Clean Energy Fund program (i.e., Tech to Market portfolio, as part of the Novel Business Models and Offerings). This investment will seek to achieve desired outcomes of developing novel insurance product prototype solutions targeted to climate technology companies, their customers, and financiers. Approximately \$1 million is targeted for continued, later-stage business acceleration services. The remaining \$5 million directly supports demonstrations of novel insurance products applied to climate technology solutions where lack of appropriate insurance products has limited market access and growth.

### **3.2.15 Clean Heat Consortium**

This program supports public private partnerships to scale adoption of clean heat solutions in NYS buildings. Drawing on the success of the Clean Heat for All initiative at New York City Housing Authority and NYSERDA's Empire Building Challenge, this initiative leverages interest from building owners to work with the supply chain of manufacturers and solution providers to decarbonize through innovative new technologies such as packaged terminal heat pumps, cold climate all electric rooftop units, and heat pump domestic hot water systems with low global warming potential.

## **3.3 Innovative Greenhouse Gas Abatement Strategies**

### **3.3.1 Industrial Innovations Program**

The Industrial Innovations program is a longer-term program that supports development and demonstration of technologies with substantial GHG reduction potential and technologies relevant to New York State manufacturing industries and building systems. Funded projects will focus mainly on innovations that reduce the use of fossil fuels, have high-replication potential for the State's manufacturing base, and are likely to be cost-effective. Projects will focus on technical innovations, including thermal-efficiency improvements for fossil-fuel based processes and alternative processes that eliminate the use of fossil fuels directly and indirectly for technologies that bring about thermal destruction of byproducts. Projects also may include changes in material input and development of advanced controls, provided they directly bring about GHG reduction. The goal of the Advanced

Buildings Program is to drive technology development and commercialization of innovative building technologies for existing buildings and new construction that offer greater energy efficiency, accelerate the integration of renewables into buildings, offer resiliency, and enable net zero energy building.

### **3.3.2 Climate Research and Analysis Program**

The Climate Research and Analysis Program supports research studies, demonstrations, policy research and analyses, and outreach and education efforts. Through these activities, the program addresses critical climate change related problems facing the State and the region, including the needs of environmental justice communities.

### **3.3.3 Clean Energy Business Development**

The Clean Energy Business Development program sought to support emerging business opportunities in clean energy and environmental technologies while maintaining the goal of carbon mitigation.

Key elements of the program included the following: (1) Providing financial support to leverage private investment in early-stage and growth-stage clean energy companies in New York State and accelerate the market introduction of innovative energy efficiency, renewable energy, or carbon abatement technologies. (2) Advancing the transition of clean energy technologies or technologies that improve the energy efficiency of industrial processes from the development/demonstration stage to the launch of commercial-scale manufacturing or application. (3) Developing and supporting a portfolio of programs designed to translate clean energy technology research into commercially viable business enterprises.

As part of the effort to bring private investment to early-stage clean energy companies in New York State, NYSERDA is working with the impact investment group, Investors' Circle, to develop a local network in New York City branded as Investors' Circle New York (IC NY). The group held monthly meetings/events to bring together the impact/social investing community in the New York Metropolitan Area, introduced clean energy investment opportunities to IC NY members, and provided feedback to the clean energy companies on how to successfully pitch to the impact/social investing community. IC NY is working to form and grow an effective and sustainable local network that will foster early-stage and growth-stage impact/social investments in clean energy companies in NYS. Additionally, IC NY worked to create stronger ties to key segments of the impact/social investor community, including foundations, family offices, sovereign wealth funds, and high-net-worth individuals.

The program was reopened in 2024 to support supply chain analysis and forums, clean energy recruiting campaigns, planning assistance, and analytical work to expand NYS manufacturers and suppliers for products and solutions that reduce greenhouse gas emissions.

### **3.3.4 Charge NY**

Charge NY will pursue three main strategies to promote plug-in electric vehicle (PEV) adoption by consumers across New York State. First, NYSERDA developed and implemented a rebate program for PEVs starting in 2017, accelerating purchases of PEVs by reducing higher upfront costs. Second, NYSERDA will invest in marketing and awareness-building activities to build interest in PEVs among the general public. A focus on building greater public knowledge and awareness of the capabilities of PEVs is essential to spur more private investment in PEV purchases and PEV charging stations. This work may also include other market development activities, such as policy and business model development studies that support new ways for critical stakeholders, such as utilities, local governments, and car dealers, to get involved in the PEV market. Third, NYSERDA will also support the installation of PEV charging stations at workplaces and multifamily buildings—location types that have been seen to be effective motivation for PEV adoption, based on usage data reported from previous installations. Regions of the State that have seen faster PEV adoption will be identified for additional charging station support, which ensures investments in infrastructure support areas with the greatest potential for additional PEV drivers. Charge NY will also initiate the deployment of a network of direct current (DC), fast charge stations across the State.

### **3.3.5 Transportation Research**

The goal of the Transportation Research Program is to commercialize technologies, products, systems, and services that provide superior GHG reduction. Activities include product development, performance validation, field testing, policy development, and business assistance to help emerging technologies achieve successful commercialization. This program has not received new funding in several years and is winding down. Work on these contracts is coming to a close. For the final open project, Unique Energy Solutions is in the process of upfitting 12 electric delivery trucks for United Parcel Service (UPS), six of which are complete.

### **3.3.6 Carbon Capture, Recycling, and Sequestration**

This program area aims to build the State’s capacity for long-term GHG emission reductions by researching strategies to prevent emissions from releasing into the atmosphere. The program focuses on



the following: (1) Assessing and demonstrating carbon capture, reuse, compression, and transport technologies, (2) Characterizing and testing the State's geological sequestration potential, (3) Supporting the development of carbon capture and sequestration demonstration projects in NYS. The program's largest supported project was TriCarb, located in Rockland County, NY. TriCarb leveraged NYSERDA funding with more than \$8 million of U.S. Department of Energy funds to investigate the potential for geological sequestration in the Newark Basin. This program is now closed.

### **3.3.7 Competitive Greenhouse Gas Reduction Pilot**

This pilot program was initiated to support market-ready projects that reduce GHG emissions at electric generating facilities in the State. The projects selected were based on a combination of requested dollar-per-ton GHG emission reduction, expected level of GHG emission reduction, and the technical merit/replication of the project across the power plant fleet in NYS. It was anticipated that projects could include, but not be limited to, supply-side energy efficiency and advanced controls resulting in cost-effective GHG emission reductions. This program is now closed.

### **3.3.8 Brookhaven National Laboratory Ion Collider**

Cornell University (CU) and the Brookhaven National Laboratory (BNL) are designing, building, and commissioning the Cornell-BNL ERL Test Accelerator (CBETA), a four-pass, 150 MeV electron Energy Recovery Linac (ERL) that is a prototype for advanced technology to be used in the future BNL eRHIC accelerator. This pilot-scale facility is located at Cornell University where all field testing/validation will occur. BNL will manage all aspects of the initiative and serve as the project contractor. The contract cost to NYSERDA is \$25 million. The work is being conducted at Cornell to fully leverage an existing \$32 million facility located on Cornell's campus. This results in significant overall cost savings for the ERL project. Timely and successful testing/validation of the pilot-scale ERL will allow BNL to submit a competitive proposal to the DOE to secure an award to build and operate an electron-ion collider (EIC) on BNL's campus that includes a full-scale ERL as a major sub-system component of the eRHIC accelerator. Energy Recovery Linacs (ERLs) recover energy from a used electron beam in order to accelerate more beam. The Cornell Brookhaven ERL Test Accelerator (CBETA) additionally saves energy by using permanent magnets rather than electromagnets, and by using superconducting accelerating structures. These energy-saving features enable far larger beam currents than in similar conventional accelerators. CBETA, funded by NYSERDA, achieved single pass beam energy recovery on June 24, 2019, a world-first for this kind of accelerator. CBETA then achieved Milestone 11: four-pass beam with energy

recovery on December 24, 2019, with four accelerating passes followed by four decelerating passes in a single loop, making it the most energy efficient accelerator of its kind in the world.

In 2016 when the CBETA project was initiated, the purpose was to test new technologies that might be used for a future electron-ion collider (EIC), the next large particle accelerator in the U.S. Just after CBETA satisfied the final technical milestone (four-pass beam with energy recovery), the U.S.

Department of Energy (DOE) announced the selection of Brookhaven National Laboratory in Upton, NY, as the site for a planned major new nuclear physics research facility. The Electron Ion Collider (EIC), to be designed and constructed over 10 years at an estimated cost between \$1.6 and \$2.6 billion, will ensure that the U.S. and NYS remain at the forefront of high-energy physics and particle accelerator technology for many years to come. This program is now closed.

### **3.3.9 Natural Carbon Solutions**

Achieving a net-zero carbon economy will require reducing emissions across all sectors. The agriculture and forestry sectors are looked upon to contribute carbon sequestration (i.e., negative emissions) as well as emissions reductions. The Natural Carbon Solutions program will catalyze technology and business solutions and lay the foundation for an economically self-sustaining bioeconomy in New York State. By establishing a marketplace of natural emissions-lowering solutions the program will demonstrate pathways to support disadvantaged rural communities, economic development, existing agriculture, and forestry industries, while increasing jobs and revenue.

### **3.3.10 Equity and Climate Transformation Research**

The Equity and Climate Transformation Research program will establish an engaged, participatory research framework to study the social dimensions of an equitable and inclusive transition in a manner that centers the lived experiences of underserved and overburdened communities and prioritizes beneficial outcomes for disadvantaged communities. The program will provide the investment necessary to develop both formal proposals for long-term funding as well as pilot initiatives. These pilot initiatives will aim to (1) test initial research hypotheses, (2) engage with a diverse set of NYS communities to understand how they would most benefit from this research and how they can be most effectively engaged in the process and (3) convene academics. The creation of an Equity and Climate Transformation Research Agenda will support scientifically rigorous inquiry that also advances transformative, inclusive solutions to climate action challenges in New York State. The work will inform strategies for effective climate awareness and consumer education initiatives.

### **3.3.11 Climate Mitigation and Resilience Research**

RGGI funds will support additional work done by the Climate Action Council Integration Analysis team and leverage current research investment to expand on energy and environmental analyses. This will include additional sensitivity analyses on land-use and climate change impact scenarios. This research would map out the risks and vulnerabilities related to climate change impacts for both the business-as-usual energy system and the carbon neutral energy system.

### **3.3.12 Scoping Plan Implementation Research**

The Climate Leadership and Community Protection Act (Climate Act) was signed into law in 2019 as one of the most ambitious climate laws in the world, putting the State on a course to reduce greenhouse gas emissions and achieve net-zero emissions, increase renewable energy usage, and ensure climate justice. RGGI funds will be used to support work to realize recommendations included in the Climate Action Council's final Scoping Plan. This work may include technical analysis to support activity requiring more detailed information, such as natural gas system planning for decarbonized future, planning an economy wide cap-and-invest program, or support for a clean transportation standard.

### **3.3.13 Hydrogen Hubs**

NYSERDA will support the deployment of clean hydrogen infrastructure as part of a regional initiative along with six other states in the northeast. Funding for this initiative will be used to support pre-engineering work for projects, stakeholder engagement, and project development.

## **3.4 Community Clean Energy**

### **3.4.1 Climate Smart Communities**

Established in 2009, the Climate Smart Communities (CSC) program is comprised of a network of local governments across the State that have committed, by adopting the Climate Smart Communities Pledge, to reduce greenhouse gas (GHG) emissions and better prepare for unavoidable changes in climate. In addition to NYSERDA, the CSC program works in partnership with five other State agencies the: DEC, Department of State (DOS), Public Service Commission (PSC), Department of Transportation (DOT), and Department of Health (DOH). In March 2011, NYSERDA issued a competitive solicitation to select contractors for a three-year CSC Regional Coordinators Pilot Program. The goal of this pilot program is to create and implement a strategic plan for engaging local governments in the CSC program, producing measurable results for climate protection and adaptation in each region, and developing important

elements of guidance for local governments. The main outreach and technical assistance components of the three-year pilot program ended in November 2015. NYSERDA will continue to offer similar outreach and technical assistance to communities through the new Clean Energy Communities program which launched in August of 2016. In the meantime, NYSERDA is working with utilities to ensure that communities have access to their aggregated energy-use data for clean energy and sustainability planning purposes. This program is now closed.

### **3.4.2 Economic Development Growth Extension Program**

The Economic Development Growth Extension (EDGE) program facilitated by Regional Outreach Contractors performs on-the-ground outreach, education, and marketing of NYSERDA program opportunities to residents, businesses, institutions, and local governments across the State to promote the value of energy efficiency, sustainable growth practices, clean energy technologies, and innovations using carefully constructed public-private partnerships. The program aligns with New York State's Regional Economic Development Council (REDC) initiative and provides direct support to advance the strategic priorities and regionally significant projects identified in each region. NYSERDA is providing a greater level of education and adoption of energy efficiency and renewable energy practices at the community level. This program is now closed.

### **3.4.3 Cleaner Greener Communities**

Former Governor Andrew M. Cuomo announced the Cleaner Greener Communities (CGC) program in his 2011 State of the State address. In coordination with the Climate Smart Communities program, the program provided support for development and implementation of a variety of sustainability strategies to help ensure that the State's ongoing investments in infrastructure aid in moving communities and New York State as a whole toward a self-sustaining, more environmentally sound future. The program encouraged communities to use public-private partnerships and develop regional sustainable growth strategies in areas such as energy efficiency, renewable energy, low-carbon transportation, and other carbon reductions. The program emphasized activities associated with smart growth, creation of green jobs, building green infrastructure, investing in environmental justice communities, and strengthening environmental protection.

### **3.4.4 Regional Economic Development and Greenhouse Gas Reduction Program**

The Regional Economic Development and Greenhouse Gas Reduction (REDGHG) program supported projects identified as priority initiatives consistent with the New York State's Regional Economic

Development Council (REDC) initiative and were not otherwise provided financial support by other NYSERDA programs or initiatives. REDGHG (1) provided cost-share funding for energy efficiency, clean and renewable energy, and/or innovative carbon abatement projects that address the regional priorities of the REDCs, (2) supplied results in strategic investments, and (3) built the capacity in the region to participate in the State's clean energy economy. REDGHG focuses on several end uses, including transportation, manufacturing and industrial process, buildings, agriculture, municipal processes, renewable electric generation, and district energy. This program is now closed.

### **3.4.5 Reforming the Energy Vision Campus Competition Program**

The Energy to Lead Competition is a competitive solicitation issued by NYSERDA's REV Campus Challenge initiative. The program challenges colleges and universities across the State to develop and implement plans to advance building decarbonization and innovative, cost-effective clean energy solutions on their campuses and local communities. Institutions are encouraged to incorporate students, curriculum integration, and community engagement into their projects. Proposals with the best solutions to achieve deep energy savings and combat climate change through energy efficiency, renewables, or GHG emission reductions will win approximately \$1 million each to help implement their plans. There were three rounds of the Energy to Lead Competition, which is no longer accepting applications.

### **3.4.6 Clean Energy Communities**

In the fall of 2015, NYSERDA, through the third and final round of the Cleaner, Greener Communities (CGC) program, awarded three contracts for regionally based outreach and technical assistance services to support NYSERDA's new Clean Energy Communities program. These services expand on the efforts undertaken previously through Climate Smart Communities (CSC) and Economic Development Growth Extension (EDGE). In addition, communities that receive the Clean Energy Communities designation will be eligible to apply for grants to implement innovative clean energy projects.

The statewide Clean Energy Communities program, which is co-funded through the Clean Energy Fund (CEF), supports local governments with a common platform and the coaching, facilitation, technical assistance, and expertise for implementing the local-level policies and planning needed to drive future clean energy market activities. These local-level actions accumulate and help to deliver the regional sustainable growth strategies encouraged by the CGC program, consistent with the regional sustainability and economic development plans. The Clean Energy Communities program also

complements the New York State Department of Environmental Conservation's (DEC) Climate Smart Communities Certification Program by assisting communities working toward certification.

### **3.4.7 Community Energy Engagement**

In November of 2017, NYSERDA launched its Community Energy Engagement Program (CEEP), which is co-funded through the Clean Energy Fund (CEF), to build awareness and increase uptake of local renewable and energy efficiency solutions. Through this program, trusted, local organizations conduct energy awareness and education to residential, multifamily, and small business customers with an emphasis on increasing the amount of funding and financing leveraged for the completion of clean energy projects and solutions. Additionally, the initiative focuses on improving energy affordability and increasing deployment of distributed energy resources for community members of all income levels, with an emphasis on low- to moderate-income (LMI) households and communities.

Ten competitively selected organizations provide engagement services in each of the Economic Development Regions, as defined by Empire State Development. These organizations deploy trusted, local Community Energy Advisors (Advisors) who engage with residents, small businesses, and multifamily building owners on how to reduce energy use and greenhouse gas emissions. Advisors help increase energy literacy and local understanding of the value of clean energy and reduced energy use. The face-to-face approach and focus on low- to moderate-income residents and communities is a strategy to help ensure the Community Energy Engagement Program makes the greatest impact. This program is now closed.

### **3.4.8 Clean Energy Workforce Development**

NYSERDA has committed more than \$127 million, including \$19 million in RGGI funds, to support workforce development and training initiatives. These efforts will help train and prepare more than 40,000 New Yorkers for growing clean energy job opportunities and assist clean energy businesses in recruiting, hiring, and training workers. More importantly, these efforts prioritize training programs for the State's most underserved populations—low-income individuals, veterans, disabled workers, single parents, the formerly incarcerated, and individuals from disadvantaged communities—and will also help integrate displaced workers into the clean energy industry. NYSERDA has provided funding to support important partnerships with labor, colleges and universities, community-based organizations, not-for-profits, manufacturers, trade associations, and others, to ensure workers are trained through continuing education courses, certificate programs, degree programs, internships, apprenticeships, and on-the-job

training. Additionally, NYSERDA supports clean energy businesses, transitioning fossil fuel workers, and new entrants into the workforce through the three initiatives summarized below. To date, the majority of RGGI funds are earmarked for these three programs which prioritize funding and, in some cases, offer higher incentives for individuals from disadvantaged communities and priority populations.

NYSERDA's Internship and On-the-job Training programs provide a wage subsidy to clean energy businesses and organizations, helping reduce the risk of hiring and training new workers in many emerging fields, including high-efficiency HVAC and energy efficiency.

- **The Clean Energy Internship** program introduces the clean energy industry and relevant career experiences to students, recent graduates, and individuals from disadvantaged communities.
- **The On-the-Job Training** program, administered in partnership with the Department of Labor, provides higher incentive levels and flexible participation options for small businesses, minority- and women-owned businesses, businesses hiring heat pump workers, and businesses hiring members of priority populations and disadvantaged communities.
- **The Climate Justice Fellowship** program funds the professional development, training, and mentoring for 150 full-time fellows to work on climate justice initiatives, ensuring an equitable clean energy transition for all New Yorkers, but especially for those disproportionately burdened by environmental health hazards and those who could benefit the most from clean energy.

### **3.4.9 Clean Energy Hubs: Community and Stakeholder Engagement**

NYSERDA will continue building local capacity within disadvantaged communities and improve stakeholder engagement through the Clean Energy Hubs program, which will increase engagement of residents and communities in New York City, support the participation of community-based and advocacy organizations in stakeholder meetings, and supporting local projects. NYSERDA will launch a network of Community Energy Hubs, which will build on the success of the Community Energy Engagement Program, in which community and locally based organizations across New York State provided outreach and education services to help low-income residents and small businesses make informed energy choices and access incentives and other resources to implement clean energy projects. The Hubs will be designed to enhance community-level engagement and capacity building by supporting clean energy concierge services. These services will be provided to residents, small businesses, nonprofits, and multifamily building owners in disadvantaged and underserved communities to increase awareness and adoption of clean energy programs and solutions, with the focus of creating a more inclusive clean energy economy.

In addition, NYSERDA will help to increase the capacity of organizations to advance clean energy projects at the local level. NYSERDA will advance a pilot effort to increase the potential for community-based organizations to plan for and develop community-scale clean energy projects that can benefit disadvantaged communities with capacity development grants. RGGI funds allocated to this program will allow for statewide activities alongside efforts supported through the Clean Energy Fund.

#### **3.4.10 Healthy Homes New Design and Construction Challenge**

This program will create a healthy home builder and developer network to get builders to design and offer carbon-neutral homes. Funding will also be used to run a healthy Neighborhood Design Challenge to support all electric sub-divisions and planned communities, as well as promote the benefits of healthy homes. Through this program, NYSERDA can accelerate the pivot to decarbonization of residential new construction and build market capability across (i.e., focus on Long Island area to complement existing activities already using Clean Energy Funds elsewhere in the state), which will support requiring decarbonized new construction via code and regulations on an accelerated five-year track.

#### **3.4.11 Climate Action Consumer Awareness and Education**

RGGI funding will be used to increase awareness and understanding of the critical need for and benefits of climate action in New York State. This investment will include an umbrella campaign to encourage broad engagement that is coordinated with a targeted marketing effort to impact the purchase decisions and actions that are needed to reach the State's goals. The targeted effort will address specific barriers across critical sectors and encourage adoption of new technologies that will improve quality of life and help decarbonize our buildings and economy.

#### **3.4.12 Statewide Community Air Quality Monitoring**

NYSERDA has allocated \$8 million in RGGI funding for community air monitoring. The statewide initiative, led by the New York State Department of Environmental Conservation, has been designed to monitor air quality in 10 disadvantaged communities, home to approximately five million New Yorkers living in areas historically overburdened by environmental pollution. Using air sensor-equipped, low-emissions vehicles on public roads, this initiative is measuring hyperlocal, community-based air pollution levels to screen for local sources of air pollution street-by-street in these communities for one year. The initiative is currently collecting this hyperlocal air pollution data to help identify sources contributing to disproportionate air pollution burdens and develop strategies to reduce air pollution within these communities, including greenhouse gas emissions contributing to climate change.



## **3.5 Green Jobs - Green New York**

Green Jobs - Green New York (GJGNY) provides funding for energy assessments, low-cost financing for energy upgrades, and technical and financial support to develop a clean energy workforce. GJGNY is a statewide effort to strengthen communities through energy efficiency and uses constituency-based organizations (CBO) to support program outreach in underserved communities. GJGNY enables New Yorkers to make a significant difference in homes, businesses, and neighborhoods—making them more comfortable, sustainable, and economically sound. GJGNY is administered by NYSERDA and made available by the Green Jobs - Green New York Act of 2009. The GJGNY 2021 Annual Report issued in October 2022, presents financial data for the approved GJGNY programs through June 30, 2022.<sup>3</sup>

The Green Jobs - Green New York Act allocated \$112 million in funding from the State's share of RGGI to support GJGNY. In consultation with the GJGNY Advisory Council, NYSERDA sub-allocated the funding, including interest earnings, across the various program components prescribed by the GJGNY Act. In addition to the RGGI funds, NYSERDA received a U.S. Department of Energy Better Buildings grant in the amount of \$40 million, of which \$18.6 million supports GJGNY financing or outreach. On occasion, NYSERDA also supplemented the GJGNY program funding with additional RGGI funds where needed to ensure uninterrupted program services.

By far the greatest demand for GJGNY funding generates from the residential revolving loan fund, with issued loans totaling its original allocation in less than three years. The residential revolving loan fund is now maintained primarily through proceeds from the sale of bonds, along with limited RGGI funds. More details regarding the bond issuance process and sustainability of the loan fund are in the annual report.

Funding allocated to individual components of Green Jobs - Green New York is nearly fully committed or expended. In order to maintain required elements of the GJGNY Act, NYSERDA included GJGNY initiatives in the planning of the CEF.<sup>4</sup> NYSERDA is working with stakeholders to incorporate lessons learned from GJGNY into CEF planning to ensure benefits from the initiatives continue, particularly those benefitting the LMI sector.

### **3.5.1 Assessments**

#### ***One- to Four-Family Residential Buildings Program Assessments***

HPwES is a comprehensive energy efficiency services program for existing one- to four-family homes. As of January 1, 2020, the HPwES program is no longer active; however, the Assisted HPwES program

(available to LMI one- to four-family homes) remains operational. Participating certified contractors conduct comprehensive home energy assessments and upgrades. Free and reduced-cost home energy assessments are available to homeowners in New York State through the GJGNY Act of 2009, which drives increased participation in this program and cuts additional GHG emissions.

### ***Multifamily Performance Program Assessments***

This program is now closed. Refer to Appendix F: Closed RGGI-Funded Programs and Completed Evaluations for more information.

### ***Small Commercial Energy Efficiency Program Assessments***

The GJGNY Small Commercial Energy Efficiency Program stopped accepting applications on December 31, 2016 and wrapped up all program activities in the first quarter of 2017. This program offered energy assessments and technical assistance to help small businesses and not-for-profit organizations improve their energy efficiency and reduce their energy costs to support the goal of increasing clean energy project adoption statewide. The program offered free energy assessments, along with technical assistance, to help identify economically viable improvements that could yield substantial annual energy savings. GJGNY offered energy assessments to small businesses and not-for-profits with an average electric demand of 100 kilowatt (kW) or less and 10 employees or fewer. Regional firms were competitively selected by NYSERDA to provide assessments and technical assistance in this program opportunity.

In Q1 2019, the GJGNY Energy Study offering was re-launched. This offering provides subsidized energy assessments and technical assistance to help small businesses (100 full-time employees or less) and not-for-profit organizations (any size) improve their energy efficiency and reduce their energy costs by identifying economically viable improvements that could yield substantial annual energy savings, including building electrification analysis. Eligible small-businesses and not-for-profits are not required to pay into the Systems Benefit Charge (SBC). A GJGNY Energy Study contractor was competitively selected by NYSERDA to provide these energy assessments.

## **3.5.2 Financing**

### ***One- to Four-Family Residential Financing***

GJGNY financing is available to participants to finance the installation of recommended energy efficiency improvements with the possibility of reimbursement through energy savings. Net-metered technologies, including solar electric systems, are also eligible for GJGNY financing. The

Smart Energy Loan, the Residential Renewable Energy Tax Credit Bridge Loan (Bridge Loan), and the innovative On-Bill Recovery (OBR) option are the three low-interest rate financing choices available through GJGNY, which enable more projects, resulting in greater reductions of GHG emissions.

### ***Multifamily Performance Program Financing***

This program concluded with the closing of the Multifamily Performance Program. Multifamily buildings may take advantage of the Small Commercial Energy Efficiency Program Financing to assist in the financing of energy efficiency or clean energy technologies improvements.

### ***Small Commercial Energy Efficiency Program Financing***

The GJGNY Small Commercial Energy Efficiency Program offers financing to help small businesses and not-for-profit organizations improve their energy efficiency and reduce energy costs to support the goal of increased clean energy adoption statewide. In June 2011, NYSERDA launched the Participation Loan product to small business and not-for-profit customers. NYSERDA provides 50% of the loan principal, up to \$50,000 at 2% interest and the participating lender provides the remaining loan principal at its market interest rate. In June 2012, NYSERDA launched the OBR Loan for small business and not-for-profit customers, making a NYSERDA loan available for up to \$50,000 at 2.5% interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill. In July 2019, NYSERDA increased its interest rate for both Participation Loans and OBR Loans to the Wall Street Journal Prime Rate of Interest + 200 basis points, fixed at closing. Twelve lenders have agreed to offer Participation Loans. NYSERDA is negotiating a contract with a single lender of originate OBR loans on a statewide basis.

### ***Predevelopment Financing***

In March 2021, NYSERDA provided \$3 million in GJGNY funding and entered into a direct contract with New York City Energy Efficiency Corporation (NYCEEC), a not-for-profit lender, to issue predevelopment loans (including Integrated Physical Needs Analysis [IPNA]), Investment Grade Energy Assessment [IGEA] studies, or similar predevelopment energy/engineering studies to assess energy efficiency improvements and renewable energy installations in eligible buildings located in New York

State). NYCEEC will issue loans for which NYSERDA provides 100% of the loan principal, up to \$150,000, at zero percent interest and will also issue loans, which NYSERDA provides 25% of the loan principal, up to \$500,000, between zero and 5%. Though we expect most loans will be at zero percent to help reduce the interest rate to the borrower, NYCEEC provides the remaining loan principal and will set their rate.

### ***Loan Loss Reserve Financing***

NYSERDA provided \$10 million of GJGNY funding to fund a Loan Loss Reserve (LLR) Program and launched an open solicitation accepting applications in December 2020. The Loan Loss Reserve/Credit Enhancement provides support for financing products which support clean energy improvements in

residential (1–4 unit) dwellings, small commercial (100 employees or less), not-for-profit and multifamily (5+ unit) buildings (eligible properties) located in New York State communities. The Loan Loss Reserve will provide reimbursement for defined losses on individual transactions.

## **3.5.3 Workforce Development, Outreach, and Marketing**

### ***Workforce Development***

The GJGNY Workforce Training and Development (WFD) initiative complements other NYSERDA and New York State Department of Labor (DOL) programs targeted at preparing individuals for energy efficiency, solar thermal, and solar electric careers in New York State. WFD programs also help to build the State’s capacity for long-term carbon reduction and facilitate energy education programs that will help build a clean energy future. Specifically, WFD efforts under GJGNY seek to expand energy-specific content in State Registered Apprenticeship and third-party accredited building trades programs. Expectations are to increase access to technical training workshops for skills enhancement and certification. In addition, the WFD programs are expected to bridge the gap between training and employment through on-the-job training incentives for businesses seeking to hire and train new workers while reaching out to low-income communities to expand training opportunities. From the program’s inception through its conclusion in March 2019, a total of 4,184 New Yorkers were trained in a range of energy efficiency and renewable energy courses.

NYSERDA issued PON 3982 On-the-Job Training (OJT) for Energy Efficiency and Clean Technology Program Opportunity Notice, which includes approximately \$520,000 in GJGNY workforce training funds that will be made available to eligible New York State employers outside of the System Benefits

Charge (SBC) service territory and to support additional new hires at all businesses statewide as a supplement to Clean Energy Fund funding. This program supports wages for new hires on a first-come, first-served basis for eligible clean energy businesses. The program includes higher wage subsidies for employers that hire workers with additional barriers to employment. To date, 71 people have been hired and approximately \$520,000 in wages and training subsidies have been awarded GJGNY funds.

Additional RGGI funding (\$2.25 million) has been added to the OJT program, supporting 115 additional hires with \$938,786 awarded for those new workers through the end of 2022.

NYSERDA's PON 4000 Clean Energy Internship Program also includes \$2.25 million in RGGI funding to support internships at eligible New York State employers outside of the SBC service territory and to support additional interns as a supplement to Clean Energy Fund funding. As of the end of 2022, 351 interns have been hired and approximately \$1,758,135 has been paid to employers to support these internships with RGGI funding.

### ***Outreach and Marketing***

GJGNY provided community-based outreach, enabled one-to-one assistance with the process of participating in the program to deliver services in underserved communities. GJGNY also provided outreach services in targeted communities through constituency-based organizations (CBO), which located residents, businesses, not-for-profits, multifamily building owners, and potential workforce candidates to participate in the program. The results of the outreach efforts were detailed in previous reports, which identified what strategies worked best for their teams. Although the GJGNY outreach funding is depleted and the CBO program is no longer active, community outreach and regional engagement utilizing constituency and other locally based organizations continue under the Community Energy Engagement Program (CEEP). For additional information about that program refer to section 4.4.7 Community Energy Engagement of this report.

## **3.6 NY Green Bank**

The NY Green Bank has replenished its funding from the RGGI Portfolio and therefore will no longer provide programmatic updates in this report. Updates can be found in the metrics report filed quarterly with the Public Service Commission.<sup>5</sup> Refer to Appendix F: Closed RGGI-Funded Programs and Completed Evaluations for more information.

### 3.7 Energy Storage

In April 2019, NYSERDA launched a deployment incentive program for bulk and retail energy storage projects on Long Island. NYSERDA made available approximately \$55 million in financial incentives.<sup>6</sup> Retail incentives for projects up to 5 megawatts (MW) were deployed for residential or commercial storage projects, and these funds continue to be committed. In 2021, NYSERDA agreed to transfer the remaining \$40 million of unallocated RGGI storage incentives to LIPA to support energy efficiency in return for LIPA committing to have a minimum of 200 MW of energy storage deployed within their service territory by 2025. This includes storage procured through a bulk storage request for proposals (RFP) that the Public Service Enterprise Group–Long Island (PSEG-LI) issued to procure at least 155 MW of bulk storage.<sup>7</sup>

Programmatic updates are provided in the annual State of Storage Report.<sup>8</sup>

### 3.8 Program Evaluation

Several RGGI evaluation studies are underway or in the planning stages as of the fourth quarter of 2022. The study objectives and timing are discussed in the following sections. Other study plans are also in development and will be detailed in future quarterly reports. The following types of evaluation activities are being performed:

- **Impact Evaluation** measures the outcomes and benefits of a program, calculates the cost-effectiveness of the program, and compares the outcomes to the program goals.
- **Market Evaluation** develops an understanding of markets and market actors, provides information to support program design and delivery, and tracks changes in markets over time.
- **Process Evaluation** reviews oversight and operations, gauges customer satisfaction, and recommends process and efficiency improvements.
- **Logic Model Reports** inform evaluation work by documenting the relationships between program activities; activity outputs; and the short-, medium-, and long-term outcomes the program intends to induce.
- **Evaluation Readiness Reviews**<sup>9</sup> help identify whether a program has various factors in place that will ensure an evaluation is justified, feasible, and likely to provide useful information.

## Appendix A. Savings Calculations Methodology

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This appendix describes the general methods and assumptions used to calculate the energy savings, emission reductions, bill savings, and cost-effectiveness metrics presented in this report.

## A.1 Energy Savings

Annual energy savings values are based on the past performance of publicly funded energy efficiency programs and information obtained from various sources of technical literature.

## A.2 CO<sub>2</sub> Reductions

Emission factors translate the energy savings data into annual GHG emission reduction values.

The GHG evaluated in the report include carbon dioxide, methane, and nitrous oxide. Because each of these gases has a different global warming potential,<sup>10</sup> emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO<sub>2</sub>e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,<sup>11</sup> shown in Table A-1.

**Table A-1. Global Warming Potentials**

These values represent a 100-year time horizon.

*Source: Intergovernmental Panel on Climate Change, 1995. Second Assessment: Climate Change.*

Gas	Global Warming Potential
Carbon dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	25
Nitrous Oxide (N <sub>2</sub> O)	298

NYSERDA uses the emission factors shown in Table A-2 to calculate emissions from on-site fuel combustion derived from the U.S. Environmental Protection Agency (EPA) emission coefficients. The CO<sub>2</sub>e values represent aggregate CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O emissions. If a program covers more than one sector, then the estimated reduction is based on a calculated average emission factor for the affected sectors.

**Table A-2. Fuel Combustion Emission Factors by Sector**

	Transport (lbs: CO <sub>2</sub> e/MMBtu)	Residential (lbs: CO <sub>2</sub> e/MMBtu)	Commercial (lbs: CO <sub>2</sub> e/MMBtu)	Industrial (lbs: CO <sub>2</sub> e/MMBtu)
Coal	N/A	224.8	211.4	203.7
Natural Gas	117.2	117.2	117.2	114.5
#2 Oil/Distillate/ Diesel	163.0	162.9	162.9	162.9
#6 Oil/Residual	N/A	N/A	166.0	166.0

Kerosene	N/A	161.2	161.2	161.2
Propane	136.1	136.1	136.1	136.1
Gasoline	158.0	N/A	N/A	N/A
Aviation Fuel	159.2	N/A	N/A	N/A
Wood	N/A	18.2	18.2	4.1
Steam	N/A	106.1	106.1	N/A

For projects installed prior to 2016, a marginal emission factor of 1,160 pounds of CO<sub>2</sub>e/MWh is used to estimate emission reductions associated with electricity reductions for all sectors.<sup>12 13</sup> When a project is installed and committed from 2016 onward, a marginal emission factor of 1,103 pounds of CO<sub>2</sub>e/MWh is applied to estimate emission reductions associated with electricity use reductions for all sectors. Although electricity savings may not lead to near-term emission reductions under the RGGI CO<sub>2</sub> cap, savings will potentially reduce imports of electricity to NYS. The demand for CO<sub>2</sub> allowances, which could lead to a possible future reduction in the cap as well as reduce the carbon footprint of end users—as users will be responsible for a smaller percent of the emissions associated with electricity production.

### A.3 Bill Savings

Annual bill savings values for each program are estimated by multiplying the energy savings by sector-specific fuel price data.

Table A-3 shows fuel prices by sector. Electricity and natural gas prices represent average values for six service territories weighted by the percentage of RGGI projects located in each utility area, excluding basic service charges.



**Table A-3. Fuel Prices by Sector<sup>a</sup>**

<b>Sector</b>	<b>Electricity (\$/kWh)</b>	<b>Natural Gas (\$/MMBtu)</b>	<b>Fuel Oil/ Distillate (\$/MMBtu)</b>	<b>Propane (\$/MMBtu)</b>
Residential	0.18	8.57	27.54	37.01
Commercial	0.16	5.09	21.77	25.07
Industrial	0.12	5.09	22.74	31.04
Transportation	0.05	N/A	26.93	N/A
C&I	0.14	5.09	22.23	28.06

<b>Sector</b>	<b>Residual (\$/MMBtu)</b>	<b>Kerosene (\$/MMBtu)</b>	<b>Wood (\$/ Cord)</b>	<b>Coal (\$/MMBtu)</b>	<b>Gasoline (\$/MMBtu)</b>
Residential	N/A	29.84	7.83	N/A	N/A
Commercial	14.75	29.84	N/A	5.78	N/A
Industrial	14.75	24.64	N/A	4.24	N/A
Transportation	N/A	N/A	N/A	N/A	N/A
C&I	14.75	27.24	N/A	5.01	28.36

<sup>a</sup> For electricity and natural gas, prices are an average of July 2012 and January 2013 prices as reported by the NYS Department of Public Service billing data.  
<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/C56A606DB183531F852576A50069A75D?OpenDocument>  
 For all other fuel types, prices reflect 2014 retail prices as reported in NYSERDA's Patterns and Trends- NYS Energy Profiles: 1997–2014 (NYSERDA 2016).

**Table A-4. Program Measure Life Assumptions**

Average savings-weighted measure life, shown by program, is used to calculate expected lifetime benefits.

<b>Program</b>	<b>Electricity Measure Life</b>	<b>Fuels Measure Life</b>
GJGNY—Single-Family Residential Assessment Component	18	24
GJGNY—Single-Family Residential Loan Component	19	23
GJGNY—Multifamily Residential Assessment Component	13	15
GJGNY—Small Commercial Loan Component	13	21
RGGI—Multifamily Performance Program	13	15
RGGI—Multifamily Carbon Emissions Reduction Program	N/A	13
RGGI—EmPower New York	N/A	24
RGGI—Home Performance with ENERGY STAR	18	24
RGGI—Green Residential Building Program	18	24
RGGI—Solar Thermal Incentive Program	N/A	20
RGGI—Low-Rise Residential New Construction Program	18	24
RGGI—NYSERDA Solar Photovoltaic Initiative	25	N/A
RGGI—Cleaner, Greener Communities	15	15
RHNY—Boilers	20	20
RHNY—Pellet Stoves	20	20
LIPA Efficiency	18	NA
LIPA Photovoltaic and Efficiency Initiative	25	N/A
Regional Economic Development and GHG Reduction	18	18
Charge NY	10	10

## Appendix B. Former Program Names

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Table B-1. Former Program Names

Current Program Name	Formerly Known As
Residential Efficiency Services	Residential Space and Water Heating
Municipal Water and Wastewater	Water and Wastewater Efficiency; Water and Wastewater Energy Efficiency
Industrial Innovations	Industrial Process Improvements; Advanced Building Systems and Industrial Process Improvements
Transportation Research	Advanced Transportation Development
Clean Energy Business Development	Clean Technology and Industrial Development
Power Systems	Advanced Power Technology Program (AFTP)

## **Appendix C. Summary of Portfolio Benefits**

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### **Table C-1. Summary of Portfolio Benefits**

Visit: <https://data.ny.gov/Economic-Development/Summary-of-Portfolio-Benefits-from-RGGI-funded-Pro/euip-iahh> on OpenNY.

### **Table C-2. Summary of Fuel Savings by Type**

Visit: <https://data.ny.gov/Energy-Environment/Fuel-Savings-by-Type-from-RGGI-Funded-Projects/3dbk-8jiw> on OpenNY

## **Appendix D. NYS RGGI Auction Proceeds**

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### **Table D-1. NYS RGGI Auction Proceeds**

Visit: <https://data.ny.gov/Energy-Environment/New-York-State-RGGI-Auction-Proceeds/vxte-b4mv> on OpenNY.

## **Appendix E. Total NYS RGGI Funds**

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### **Table E-1. NYS RGGI Funds**

Visit: <https://data.ny.gov/Energy-Environment/New-York-State-RGGI-Funds/bkzt-72yv> on OpenNY.

## **Appendix F. Closed RGGI-Funded Programs and Completed Evaluations**

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Information on Closed RGGI-Funded Program and Completed Evaluations can be found in the most recent RGGI Status Report: <https://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-Reports/RGGI-Reports>

# Endnotes

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- <sup>1</sup> Baseline Market Evaluation of Renewable Heat New York, <https://www.nyscrda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2020-Renewable-Heat-NY-Market-Evaluation-Report-Final.pdf>
- <sup>2</sup> HPwES low-rise buildings encompass buildings with three stories or less, with eight units or less, and are constructed using building techniques common to one- to four-family homes. They must be served by residential-scale heating equipment with a maximum rating of 300,000 Btu. Taller residential buildings that fit these criteria are also eligible. Examples include brownstones, row housing, and other urban-style buildings.
- <sup>3</sup> Green Jobs Green New York Annual Report <https://www.nyscrda.ny.gov/About/Publications/GJGNY-Advisory-Council-Reports>
- <sup>4</sup> The Clean Energy Fund (CEF), one of Reforming the Energy Vision's (REV) three strategic pillars, is designed to deliver on the State's commitment to reduce ratepayer collections, drive economic development, and accelerate the use of clean energy and energy innovation. It will reshape the State's energy efficiency, clean energy, and energy innovation programs. Visit <http://www.nyscrda.ny.gov/About/Clean-Energy-Fund> for more details regarding CEF planning.
- <sup>5</sup> New York Green Bank Public Filings <https://greenbank.ny.gov/Resources/Public-Filings>
- <sup>6</sup> This funding, originally allocated to the NY Green Bank, has been returned to the RGGI portfolio as the bank has recouped on the original investment.
- <sup>7</sup> PSEG-Long Island 2021 Bulk Energy Storage Request for Proposals, <https://www.psegliny.com/aboutpseglongisland/proposalsandbids/2021bulkenergystoragerfp>
- <sup>8</sup> State of Storage in New York, Annual Energy Storage Deployment Report, <https://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7137DCF7-178A-4D93-AC22-76301A071024}>
- <sup>9</sup> PSEG-Long Island 2021 Bulk Energy Storage Request for Proposals, <https://www.psegliny.com/aboutpseglongisland/proposalsandbids/2021bulkenergystoragerfp>
- <sup>10</sup> A global warming potential is a measure that estimates how much a given mass of a GHG contributes to global warming. Calculations span over a specific time interval, which is 100 years for the IPCC Second Assessment Report values.
- <sup>11</sup> IPCC, 2007. Fourth Assessment: Climate Change 2007. This inventory uses potentials from the IPCC Fourth Assessment Report, rather than values from more current assessments. The Fifth Assessment Report was released in 2014–15. New York DEC regulation Part 242 1.2 (49) uses the Third Assessment values, while the EPA GHG Reporting Rule and the NY GHG Inventory and Forecast use the Fourth Assessment. Reconciliation between methodologies will be investigated as part of the program implementation and evaluation process.
- <sup>12</sup> Per the Clean Energy Advisory Council (CEAC) Metrics, Tracking and Performance Assessment (MTPA) Working Group, NYSERDA has adopted a marginal electricity grid emission factor of 1,103 pounds CO<sub>2</sub>e/MWh for projects completed after 2015 (<http://documents.dps.ny.gov/public/MatterManagement/MatterFilingItem.aspx?FilingSeq=190731&MatterSeq=50399>). Projects completed prior to 2016 will maintain the 1,160 pounds CO<sub>2</sub>e/MWh previously used, based on analysis of grid emissions at that time. Carbon emissions reductions are now expressed in terms of metric tons. Reports published prior to August 2020 represented carbon emissions in short tons.
- <sup>13</sup> Beginning with Q4 2016, NYSERDA updated emission factors for natural gas, #2 oil, #6 oil, kerosene, propane, wood and steam to be consistent with emission factors used in the updated NYS Greenhouse Gas Inventory (<https://www.nyscrda.ny.gov/About/Publications/EA-Reports-and-Studies/Energy-Statistics>). These factors are derived from EPA's February 2016 State Inventory Tool release (<https://www.epa.gov/statelocalclimate/state-inventory-and-projection-tool>). Steam emission factors have been updated to be consistent with New York City's updated Greenhouse Gas Inventory [http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC\\_GHG\\_Inventory\\_2014.pdf](http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC_GHG_Inventory_2014.pdf)