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New York's Regional Greenhouse Gas Initiative Investment Plan

2015 Operating Plan

September 2015

NYSERDA's Promise to New Yorkers:

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

Mission Statement:

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

Vision Statement:

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

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2015 Operating Plan

Prepared by:

New York State Energy Research and Development Authority

Albany, NY

Allison Rose
Project Manager

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Summary of Benefits

The RGGI portfolio of programs will reduce and avoid greenhouse gas and other air pollutant emissions, demonstrate New York's commitment to its environmental goals, and support the movement toward a national, multi-sector greenhouse gas reduction program.

Specifically, the near-term program investments[1] listed in this annual update of the Operating Plan totaling $298.9 million are anticipated to result in CO_2e[2] emission reductions, energy savings, bill savings and job creation as presented below.[3] Green Jobs-Green New York, Residential Energy Services, LIPA Efficiency and Renewable Energy, Renewable Heat and New York Sun are the deployment program areas that are expected to realize savings during the current Plan timeframe. These programs represent approximately 84 percent ($177.4 million) of the near-term program investments described in this plan. Additionally, with the initiation of new program activities NYSERDA is continually in the process of examining other metrics for measuring and assessing the benefits of the investment of RGGI proceeds.

Estimated benefits related to the Cleaner Greener Communities program, NYGreen Bank, or other research and development (R&D) initiatives are not included due to the uncertainty of project activities and associated savings. Nevertheless, some benefits can be anticipated from these program areas

1 "Near-term program investments" reflect the combined total of remaining program funds plus estimated auction proceeds for fiscal year 2015/16

2 CO_2e stands for carbon dioxide equivalent and describes the amount of CO_2 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. Emissions factors are used to translate the energy savings data into annual GHG emissions reduction values. The GHGs evaluated in the report include carbon dioxide, methane, and nitrous oxide. Because each of these gases has a different global warming potential, emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO_2e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value. Equivalent carbon dioxide incorporates additional greenhouse gases by relating them to the functionally equivalent amount of carbon dioxide, using 100-year global warming potential. In this case, Methane (CH_4) and nitrous oxide (N_2O) are included. See Appendix.

3 Due to the nature of some projects, there can be lag time between initial investment in projects and realization of the associated savings. The values represented here may not be realized in the same year in which the funds are expended. Nevertheless, NYSERDA anticipates that the ratio of savings to dollars reflects the benefits which are likely to accrue as a result of projects funded through this program. Metrics and goals presented in this document (e.g., dollars per ton) are subject to modification in the event that changes are made to the discounting rate, discounting approach, evaluation methods, or emission factors.

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 greater detail in the program description sections of this report.

The Summary of Benefits provides a quantitative estimate of the benefits associated with these deployment programs.

S.1 Emissions Reductions,[4] Energy Savings[5] and Energy Bill Savings

Investments of RGGI proceeds into the programs listed in this Operating Plan are anticipated to result in more than 3.4 million tons of CO_2e emission reductions over the expected lifetime of the measures and practices; the equivalent of removing nearly 31,000 cars off the road each year over the lifetime of those measures.[6] Specifically, the expected lifetime emission reductions would total more than 0.9 million tons of CO_2e from electricity energy efficiency savings and solar electric generation and more than 2.5 million tons of CO_2e from other fuel savings. These expected lifetime emission reductions are associated with the displacement of nearly 4.3 million barrels of crude oil.[7]

The investment of RGGI proceeds into the programs listed in this Operating Plan are anticipated to achieve nearly 33.6 million MMBtu of expected lifetime energy savings across all fuel types (excluding electricity). Additionally, electricity savings from energy efficiency would account for more than 450,000 megawatt-hours (MWh) of additional expected lifetime savings and electricity generation from renewable projects would account for more than 2.4 million MWh of expected lifetime generation.

The estimated participant bill savings related to the investment of RGGI proceeds into the programs listed in this Operating Plan are more than $1,281.7 million in total expected non-discounted lifetime savings.

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4 The CO_2e reductions shown throughout this document include CO_2 reductions plus the co-benefits of other GHG reductions. In addition, Appendix A explains the methodologies used to calculate various metrics appearing in the Plan.

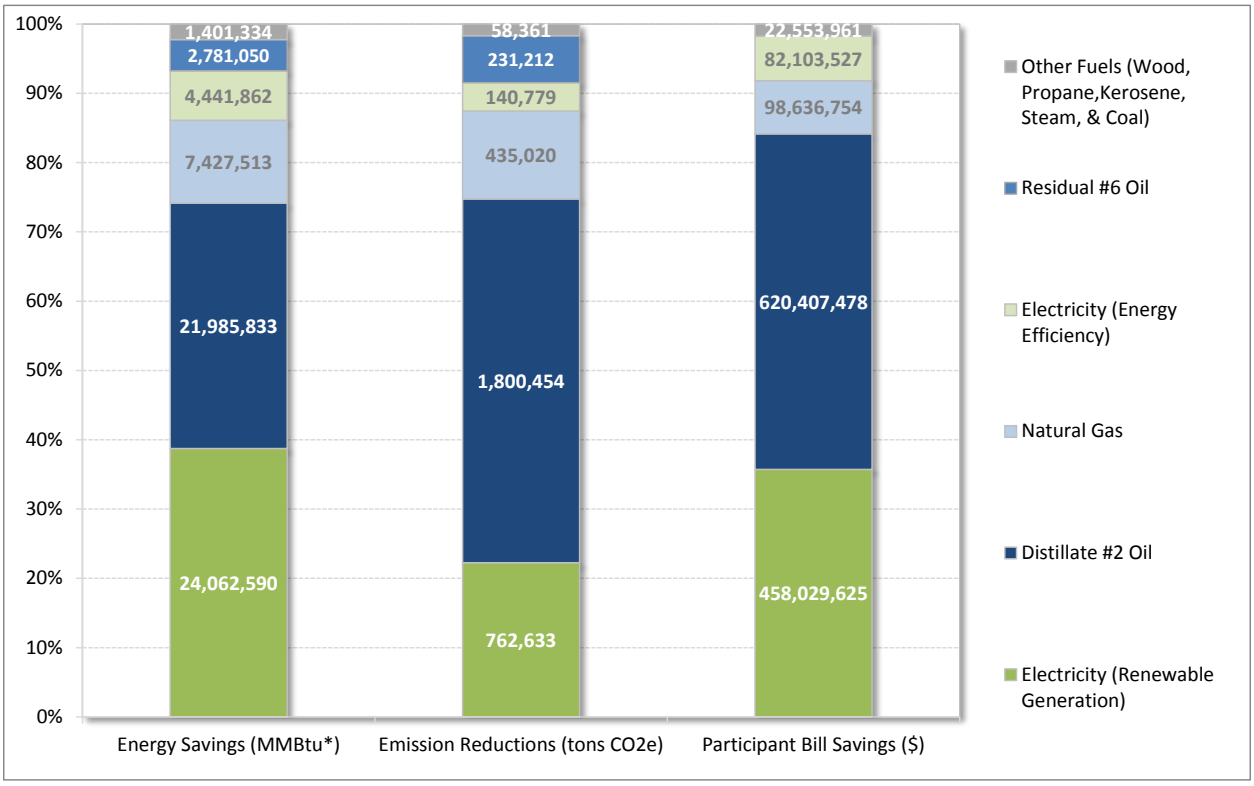
5 The program areas are Green Jobs- Green New York, Residential Efficiency Services, NY Sun, Renewable Heat NY and LIPA Efficiency and Renewable Energy.

6 The expected lifetime benefits are the energy, economic and environmental benefits that accrue over the lifetime of a project. See Appendix A, Table A-4 for the measure-life assumptions by Program.

7 This estimate does not account for the full lifecycle costs for producing and distributing crude oil and petroleum products.

Figures S-1 and S-2 show the expected lifetime energy savings, emission reductions, and participant energy bill savings by fuel type. For comparison purposes, the electricity savings/generation were converted to source MMBtu. Benefit achievements are updated on a quarterly basis and can be found in New York's RGGI-Funded Programs Status Report which are available on NYSERDA's website at: http://www.nyserda.ny.gov/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Evaluations-of-Funds.aspx

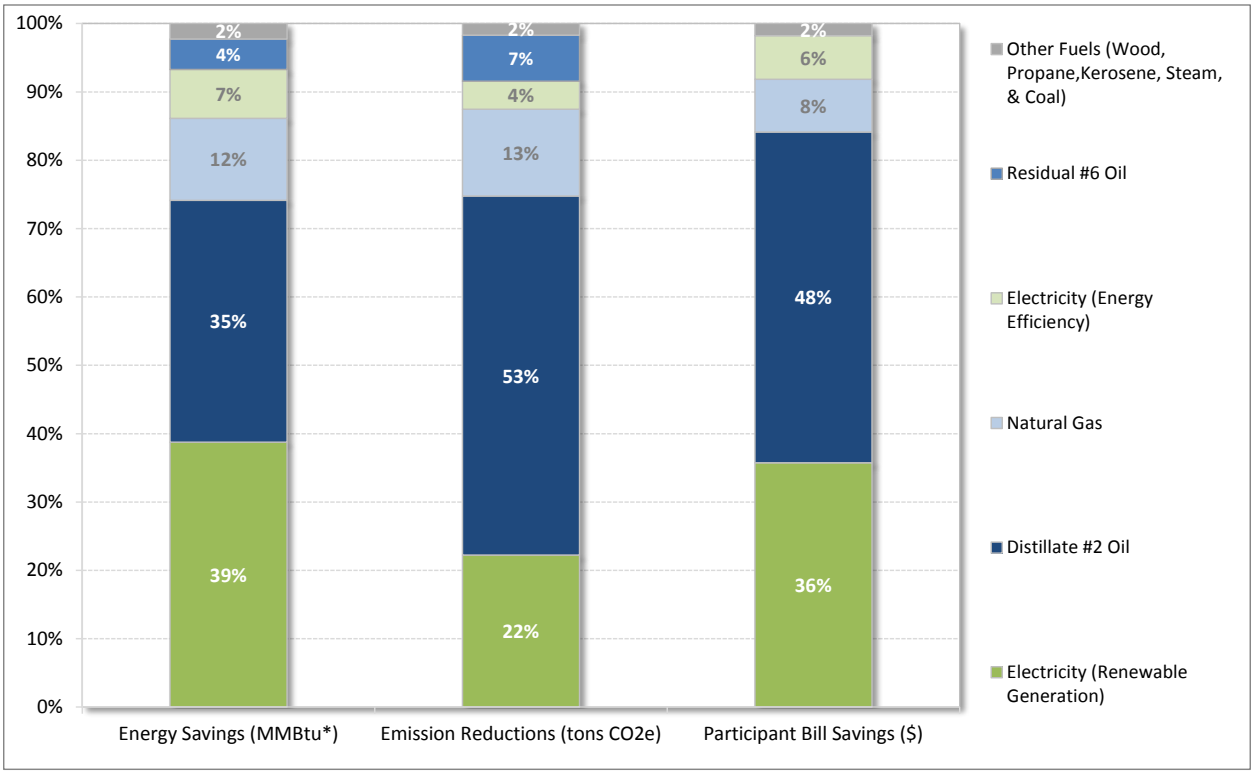
FigureS-1. Benefits by Fuel Type for Expected Lifetime Energy Savings, Emission Reductions, and Participant Bill Savings[a]



a Benefits quantified for 84 percent of the portfolio. Balance will be quantified annually as scopes are refined.

* To convert to source MMBtu, the kWh savings and generation for the electric measures were adjusted to account for savings at the source of generation. This approach enables an order of magnitude comparison between electric and fuel energy savings/generation. The source factor used is 9,860 Btu/kWh, which is based on a three-year rolling average (2009, 2010, and 2011) of the amount of fossil fuel energy generated to produce electricity over the three year period, and includes a line loss factor of 7.2 percent.

Figure S-2: Percent Contribution by Fuel Type for Expected Lifetime Energy Savings, Emission Reductions, and Participant Bill Savings[a]



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S.2 Job Creation

Preliminary estimates for potential job creation associated with RGGI-funded programs have been calculated based upon historical data and modeling for deployment, technology development, and business development programs. This information is used as a preliminary estimate and actual job impacts are examined as part of the RGGI evaluation activities. Table S-1 shows how different job multiplier estimates are applied to the near-term program investments reflected in this Plan.

Table S-1. Job Creation Estimates Related to Near-term Program Investments from RGGI[a]

Program Category	Program Name	Near-term Program Investments ($ millions)	Near-term Program Investments with Admin & Evaluation ($ millions)b	Estimated Job Creation Multiplier	Net Estimated Sustained Jobs Created or Retainedc
Energy Efficiency & Other Deployment	Renewable Heat	$268.5	$292.6	3.2	936
	NY Sun				
	Green Jobs-Green New York				
	Residential Energy Services				
	Cleaner Greener Communities Program				
	Regional Economic Development and Greenhouse Gas Reduction				
	NY Green Bank				
	LIPA PV / Efficiency				
Technology & Business Development	Transportation Research	$19.2	$20.9	9.5	199
	ChargeNY				
	Clean Energy Business Development				
	Advanced Renewable Energy				
Research	Climate Research and Analysis	$3.9	$4.3	N/A	N/A
Other	Climate Smart Communities	$7.3	$8.0	N/A	N/A
	Economic Development Growth Extension				
	Total	**$298.9**	**$325.8**	**N/A**	**1134**

a The Energy Efficiency & Other Deployment programs multiplier is based upon macroeconomic evaluation of the Energy Smart[SM] portfolio and the multiplier for Technology and Business Development multiplier is based upon macroeconomic analysis of the product development portion of NYSERDA's R&D portfolio.

b This value represents the sum of anticipated commitments for the near-term program investments plus Program Administration (four percent) and Program Evaluation (five percent) and State Cost Recovery Fee (2.5 percent). This Plan covers program funding based on estimated auction proceeds for FY 2015-16 as well as funding from prior collections that have not yet been committed under contract.

c These values represent estimates of the number of net sustained jobs created through the near-term program investment of funds presented in this Operating Plan. A different type of jobs analysis was recently completed for the Green Jobs-Green New York program. This program evaluation initiative estimated the gross number of engineering, remodeling and building-related jobs that are created/retained by GJGNY program activity. The analysis estimated that approximately 1,000 direct jobs were created through 2013 and that this number might grow to about 2,700 by 2015. These jobs are based on point-in-time estimates by survey respondents and job persistence may be dependent on the continued availability of future funding for these types of activities.

1 Introduction

1.1 Background

Through the Regional Greenhouse Gas Initiative (RGGI), New York and its partner states have pioneered the nation's first market-based cap-and-invest program to help control the carbon dioxide (CO_2) emissions that are 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 is also creating a national model through its RGGI Operating Plan (Plan), demonstrating how strategic investments across disciplines and across the economy can support comprehensive strategies that best advance the CO_2 emission reduction goals of the State.

New York maintains a robust portfolio of clean energy programs, and proceeds from the sale of RGGI CO_2 allowances are used to supplement existing policies and programs. The Plan is structured to result in immediate emissions reductions, while building capacity for long-term carbon emissions mitigation action. 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.

Building from the December 2014 version of the RGGI Operating Plan, this annual update to the Plan incorporates feedback and direction received during a public stakeholder meeting in April 2015,[8] and subsequent written comments from stakeholders. The Plan was approved by NYSERDA's Board in June 2015. Overall, the Plan covers near-term program investments comprised of the following RGGI funds:

- Anticipated proceeds from auctions to be held during fiscal year 2015-16
- Remaining program funds from prior auction proceeds.

The scope and approach for allocating the anticipated proceeds was approved by NYSERDA's Board of Directors in June 2015, and the use of previously-obtained proceeds that comprise remaining program funds was approved by the Board at earlier meetings.

[8] The participating stakeholders represent a broad array of energy and environmental interests to advise NYSERDA on how to efficiently make use of proceeds from the sale of allowances consistent with the directives in the regulations.

Historically the investment of RGGI auction proceeds has been designed to complement existing programs, including the System Benefits Charge (SBC), Renewable Portfolio Standard (RPS), Weatherization Assistance Program, Energy Efficiency Portfolio Standard (EEPS), and various transportation programs funded by the federal Congestion Mitigation and Air Quality Improvement Program. This year's Plan also reflects the potential transition of several RGGI-funded programs to the new Clean Energy Fund (CEF), the successor to SBC, customer-sited RPS and EEPS.[9] If approved by the PSC, the use of RGGI funds under the CEF will similarly be used to complement activities envisioned under that proposal. RGGI-funded programs create synergies with existing efficiency and clean energy programs, and also 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 upon as a sole source to achieve the State's contribution towards national or global carbon mitigation goals. Rather, the Plan should be considered in context of the other policies and programs that help to reduce greenhouse gas emissions and, has been designed to strengthen and enhance the comprehensive statewide energy policy in order to best leverage the State's collective resources to achieve the identified energy goals.[10] In short, RGGI will continue to complement NYSERDA's future program activities aimed at reducing greenhouse gas emissions in New York State.

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

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9 On September 23, 2014 NYSERDA filed a CEF Proposal with the Public Service Commission (PSC) which describes a 10-year plan that would serve as a successor to existing ratepayer funded initiatives. On June 25, 2015 NYSERDA filed an Information Supplement including both material from the initial CEF Proposal and supplemental information to complete and replace the initial CEF Proposal. The Information Supplement is available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FC3FBD53-FBAC-41FB-A40E-3DA0A5E0866A}.

10 See "The Energy To Lead: 2015 New York State Energy Plan." 2015 available at: http://energyplan.ny.gov/

To realize both the immediate need for 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 will:

- 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 can realize GHG emissions reductions in the near-term and provide valuable information to consumers and supply chain participants for self-sustaining markets for 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. By using new financing strategies or program approaches targeting specific uses, the portfolio creates an opportunity to increase penetration of existing programs and expand the reach of clean energy programs to communities that may not traditionally take 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 that help to expand the economy and support innovative New York 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.

1.2 Regulatory Context

RGGI is a nine-state cooperative effort to reduce GHG emissions from electric power plants by means of a cap-and-trade system.[11] Under RGGI, the participating states initially designed cap-and-trade programs that cap CO_2 emissions from power plants through 2015 and then lower the cap by 10 percent by 2018. In January 2012, the RGGI states began a 2012 Program Review as called for in the Model Rule.[12] The Program Review included a comprehensive evaluation of program success, program impacts, additional reductions, imports and emissions leakage, and offsets. The regional RGGI Program Review was completed in early 2013 and on February 7, 2013, the RGGI participating states announced proposed

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11 The RGGI-participating states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont.

12 The RGGI Model Rule is a set of proposed regulations that form the basis for each RGGI State's CO_2 Budget Trading Program.

program changes, including a more stringent CO_2 emission cap, and released an Updated Model Rule. Subsequently, the participating states began working to incorporate program changes into their respective regulations. The RGGI states have since implemented these changes which took effect in each state on or about January 1, 2014.

Each state is implementing this initiative through individual CO_2 Budget Trading Programs that are linked through the regional cap-and-trade program. Additional background on the initiative can be found at http://www.rggi.org.

In New York, the RGGI Program has been implemented through two complementary programs: The New York State Department of Environmental Conservation (DEC) has established New York's CO_2 Budget Trading Program (6 NYCRR Part 242, 6 NYCRR Part 200, General Provisions) and the New York State Energy Research and Development Authority (NYSERDA) has established the CO_2 Allowance Auction Program (21 NYCRR Part 507).

The CO_2 Allowance Auction Program has established the rules through which New York will sell most of its CO_2 allowances. The CO_2 Allowance Auction Program (at 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_2 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 and 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. RGGI-funded programs also help to build capacity for long-term GHGreduction by training workers and partnering with the clean energy industry.

Using innovative financing, RGGI supports the pursuit of cleaner, more efficient energy systems and encourages investment to stimulate entrepreneurial growth of clean-energy companies. All of these activities use funds in ways that accelerate the uptake of low-emitting technologies.

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.

1.4 Program Focus and Geographic Scope

RGGI-funds have historically been used to support programs ineligible for funding from other sources. For instance, RGGI program funding has been used to complement current investments in the New York Energy $mart^{SM} program, which is part of New York's SBC programs, the RPS, and the EEPS and other agency programs that support the same goals. Similarly, going forward RGGI-funded activities will complement and enhance CEF initiatives.[13]

Geographic equity of expenditures and benefits will be pursued across the portfolio of programs, not on a program by program basis. Certain programs may have a limited geographic focus; 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.
- Potential to reduce the costs of achieving the RGGI emissions cap.
- Other benefits for New York 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.

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[13] NYSERDA's proposed CEF is available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FC3FBD53-FBAC-41FB-A40E-3DA0A5E0866A}

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_2 Emissions Offset credits under the CO_2 Budget Trading Program, with the 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

This section provides an Overview of Program Funding. Funds available for investment or commitment during the near term planning period described in this Plan are comprised of two components:

- Estimated future proceeds from fiscal year 2015/16
- Remaining program funds

2.1 Assumptions about Auction Proceeds for Operating Plan

Estimated auction proceeds for fiscal year 2015/16 are anticipated to be $127.4 million.

For planning purposes, it is assumed that the average 2015 allowance price will be $5.38/allowance. This figure represents the average price from auctions 24-27. For planning purposes, values beyond 2015 are escalated by the real after tax weighted cost of capital (4.8%/year), which was an assumption incorporated into recent program modeling. Additionally, the planning horizon for the 2015 Operating Plan is one year because it is difficult to reliably estimate proceeds levels three years into the future due to market volatility, the uncertain impact of potential market speculation related to Federal CO_2 regulations, and because the anticipated future leveraging of RGGI proceeds with proposed CEF activities is still under development. This approach results in estimated proceeds of $127.4 million for FY 15/16.

2.2 Remaining Program Funds as of March 31, 2015

As described in Table 2, $760.2 million in proceeds have been collected through March 31, 2015. Program funding, net of administration, evaluation and other fees through March 31, 2015 totaled $587.3 million. This $587.3 million is then distributed among the programs, with $103.7 million allocated to Green Jobs-Green New York, $48.6 million allocated to NY Green Bank as a part of the Clean Energy Fund, $411.5 allocated to all other RGGI programs, and a remaining $23.5 million reserved in surplus through March 31, 2015. Of the total historical $587.3 million for all programs, $130.3 million is comprised of remaining program funds and will be applied to near-term program investments. Of these remaining program funds, $84.5 million is committed to long-term priorities, including legislatively mandated programs.[14]

[14] These programs include Green Jobs – Green NY; NY Green Bank; and Cleaner, Greener Communities.

2.3 Current Actual and Anticipated Future Funding

Table 1 provides a snapshot of how auction revenues collected through March 31, 2015 were distributed among various initiatives, administration, evaluation, State Cost Recovery Fees, support for RGGI Inc., and other related expenses. Additionally, Table 1 presents a description of how anticipated/new proceeds from RGGI auctions in fiscal year 2015-16 will be invested.

Expenses in FY 2015/16 are anticipated to exceed revenue projections in that year. This is due to new legislatively-mandated funding requirements for Green Jobs - Green New York. The Green Jobs – Green New York (GJGNY) Program, created under the Green Jobs-Green New York Act of 2009, provides New Yorkers with access to energy assessments, installation services, low-interest financing, and pathways to training for various green-collar careers. While NYSERDA had announced in December 2014 an intention to transition out of certain aspects of the GJGNY financing program, the enacted 2015-16 State Budget directs NYSERDA to continue providing such financing through March 31, 2016 to all customers that were eligible for the program at the end of 2014. As of March 31, 2015, the GJGNY program (originally funded with $112 million of RGGI funds as directed in the GJGNY Act, plus accumulated interest earnings and additional funding allocated from the March 2015 auction) had very limited uncommitted funds. Based on current loan applications and loan origination volume, NYSERDA estimates that additional funding of $80 million will be required to continue GJGNY financing through March 31, 2016 (approximately $32 million for residential energy efficiency loans and $48 million for residential solar loans). NYSERDA will allocate $80 million from the 2015 anticipated revenues to fund these loans. NYSERDA anticipates that financing a pool of energy efficiency loans during 2015 through bonds to be issued by the NYS Environmental Facilities Corporation (EFC) through the Clean Water State Revolving Fund, and estimates that bond proceeds of approximately $19 million will be available (after paying a $30 million Short-Term Financing Note issued to EFC in 2014) to replenish the RGGI fund. NYSERDA is exploring a bond or note financing for residential solar loans and anticipates that proceeds of approximately $34 million will be available to replenish the RGGI fund. Combined, the total reimbursements are anticipated at approximately $53 million. This is reflected in Table 1 and Table 2.

The $27 million in net funding required for the GJGNY financing program extension was not contemplated when the 2015 Operating Plan extension was first formulated. Rather than adjusting proposed funding for programs currently supported in the 2015 Operating Plan, NYSERDA plans to fully fund the GJGNY financing extension from future program revenues. The resulting net deficit at the end of FY15-16 totals $20.6 million. This represents a manageable commitment level compared to FY 15-16 projected revenues, and will be considered in presenting the FY16-17 and future RGGI Operating Plans.

In the near-term NYSERDA anticipates that there will be sufficient cash balances to cover projected RGGI program expenditures for FY15-16.

Additional information about other fees and expenses that are netted-out from total auction proceeds are also shown and described in further detail below.

Table 1. Current Actual and Estimated Budgets as of March 31, 2015[a]

		Cumulative Allocation Through March 2015 ($ millions)	FY 2015-16 ($ millions)	Total ($ millions)
Proceeds	RGGI Auction Proceeds	$ 760.2	$ 127.4	$ 887.6
	Total Allocated RGGI Interest Earnings	$ 5.9	$ -	$ 5.9
	Total Allocated GJGNY Interest Earnings	$ 1.8	$ -	$ 1.8
	Total Proceeds	**$ 767.9**	**$ 127.4**	**$ 895.3**
Directed	Budget Transfer	$ 90.0	$ -	$ 90.0
	Transfer to State - Environmental Tax Credits	$ -	$ 41.0	$ 41.0
	Transfer Total	**$ 90.0**	**$ 41.0**	**$ 131.0**
	GJGNY Program Funds	*$ 101.9*	*$ 77.8*	*$ 179.7*
	GJGNY Overhead[b]	$ 15.3	$ 2.2	$ 17.5
	GJGNY Reimbursement	$ -	$ (53.0)	$ (53.0)
	GJGNY Transfer Total	**$ 117.2**	**$ 27.0**	**$ 144.2**
	GJGNY Allocated Interest Earnings	*$ 1.8*	*$ -*	*$ 1.8*
	GJGNY Total	**$ 119.0**	**$ 27.0**	**$ 146.0**
Clean Energy Fund	Clean Energy Fund	$ -	$ 6.3	$ 6.3
	Green Bank Program Funds	*$ 48.6*	*$ -*	*$ 48.6*
	Green Bank Overhead[b]	$ 4.4	$ -	$ 4.4
	Clean Energy Fund Total	**$ 52.9**	**$ 6.3**	**$ 59.2**
All Other RGGI Programs	*Available RGGI Program Funds*	*$ 429.1*	*$ 44.5*	*$ 473.7*
	RGGI Allocated Interest Earnings	*$ 5.9*	*$ -*	*$ 5.9*
	RGGI Overhead[b]	$ 43.8	$ 6.1	$ 49.9
	Litigation settlement	$ 19.5	$ 1.5	$ 21.0
	RGGI Inc Startup Costs	$ 1.6	$ -	$ 1.6
	RGGI Inc pro-rata costs	$ 6.1	$ 1.0	$ 7.1
	RGGI Total	**$ 505.9**	**$ 53.2**	**$ 559.1**
Summary	***Program Funds Total[a]***	***$ 587.3***	***$ 128.6***	***$ 715.9***

[a] Program Funds Total is the sum of the GJGNY Program Funds, GJGNY Allocated Interest Earnings, Green Bank Program Funds, Available RGGI Program Funds and RGGI Allocated Interest

[b] Overhead includes Administration, Evaluation and State Cost Recovery Fee

Descriptions and estimated benefits of near-term program investments are discussed in Sections 3 through 16 of this Operating Plan. For reference, the 2015 RGGI Operating Plan Amendment details how these funds will be distributed among the 14 programs. A copy of the 2014 Operating Plan Amendment can be found on NYSERDA's website: http://www.nyserda.org/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx

Additional information about the specific fees and expenses that are netted-out from total auction proceed estimates can be found below.

2.3.1 Repayment of SBC 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 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.

2.3.2 Ongoing New York Share of RGGI, Inc. Costs

RGGI, Inc. is a non-profit corporation created to support development and implementation of CO_2 Budget Trading Programs in New York and other participating states.

NYSERDA has entered into an agreement for RGGI, Inc. to provide technical and support services for key elements of New York's CO_2 Budget Trading program, including:

- Developing and maintaining a system to report data from emissions sources subject to RGGI, and to track allowances.
- Implementing a platform to auction CO_2 allowances.
- Monitoring the market related to the auction and trading of CO_2 allowances.
- Providing technical assistance to the participating states in reviewing applications for emissions offset projects.
- Creating and implementing a market monitoring program.
- Providing technical assistance to the participating states to evaluate proposed changes to the states' RGGI programs.

New York's share of RGGI, Inc. costs was estimated to be approximately $1,000,000 per year during the planning period. This estimate was approved by the RGGI, Inc. Board of Directors in their 2013 RGGI, Inc. budget.

2.3.3 State Cost Recovery Fee

NYSERDA is 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 NYSERDA 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.

2.3.4 Other Budget Components

On December 4, 2009, New York enacted numerous 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's long-term fiscal health.

In addition, on January 29, 2009, a lawsuit was initiated in State Supreme Court against the Governor, NYSERDA and other State entities, claiming that the RGGI regulations are unlawful and discriminatory. The original parties to the lawsuit as well as others that were joined as parties, including Consolidated Edison (Con Edison), entered into a settlement agreement resolving the litigation that was approved on October 1, 2010 by the court. Under the terms of the settlement, NYSERDA will use proceeds from RGGI auctions to meet its obligations to pay Con Edison in accordance with a formula set forth in the settlement agreement. Con Edison, in turn, will use the monies provided by NYSERDA to fund energy efficiency and renewable energy programs with significant carbon reduction potential within its service territory. NYSERDA has paid Con Edison approximately $14.9 million to date. As of March 31, 2014, it is estimated that NYSERDA's additional future obligations under the settlement agreement will total approximately $3.9 million.

In June 2011, three individuals filed a new lawsuit in State Supreme court, seeking a ruling that RGGI has been unlawful from its outset. Governor Cuomo, DEC, and NYSERDA were named as defendants. The Attorney General's Office (OAG) subsequently filed a motion to dismiss the lawsuit. OAG argued that the plaintiffs did not have legal "standing" to bring the lawsuit because they were not suffering any injury from the program. OAG asserted that the lawsuit appears to have been brought at the behest of two groups – Americans for Prosperity (AFP) and the Competitive Enterprise Institute (CEI) – as part of a campaign to convince states to repeal their RGGI programs. OAG also claimed that because the plaintiffs unreasonably delayed in filing the lawsuit, their claims were time-barred under the applicable statute of limitations, and were further subject to dismissal on laches grounds due to the substantial prejudice to

New York, other states, and businesses if the lawsuit proceeded at that time, nearly three years after the RGGI regulations went into effect. In June 2012, the court granted a motion to dismiss on the grounds that the plaintiffs (1) lacked legal standing and (2) waited too long to sue, and thus were barred by the doctrine of laches. The Supreme Court's dismissal was upheld on appeal by Plaintiffs to the Appellate Division, Third Department. In April of 2014, New York's highest-level court, the Court of Appeals, denied Plaintiffs' subsequent request for further review.

2.3.5 Program Evaluation and Administration

Program evaluation and administration costs have been budgeted for fiscal year 2015/16 at four and five percent, respectively, of total revenues. These figures are consistent with the rates necessary to evaluate and administer the energy efficiency and technology and market development programs funded through RGGI.

2.4 Summary of Proceeds Investment by Program

Table 2 provides a summary of proceeds investment by program and shows how $732.4 million of net program funds made available through RGGI auctions have been, or will be allocated among programs through fiscal year 2015-16. First, the table describes how prior auction proceeds through March 2015 have been allocated among programs. Then, the table reflects the balance of remaining program funds by program through March 31, 2015. Next, the table shows the planned allocation of $168.6 million for fiscal year 2015-16 among programs. Finally, the table summarizes how all auction proceeds through fiscal year 2015-16 have been, or will be allocated among programs. Funding allocations may be refined based upon the actual level of auction allowance proceeds that are received, consistent with expectations outlined in the amendment.

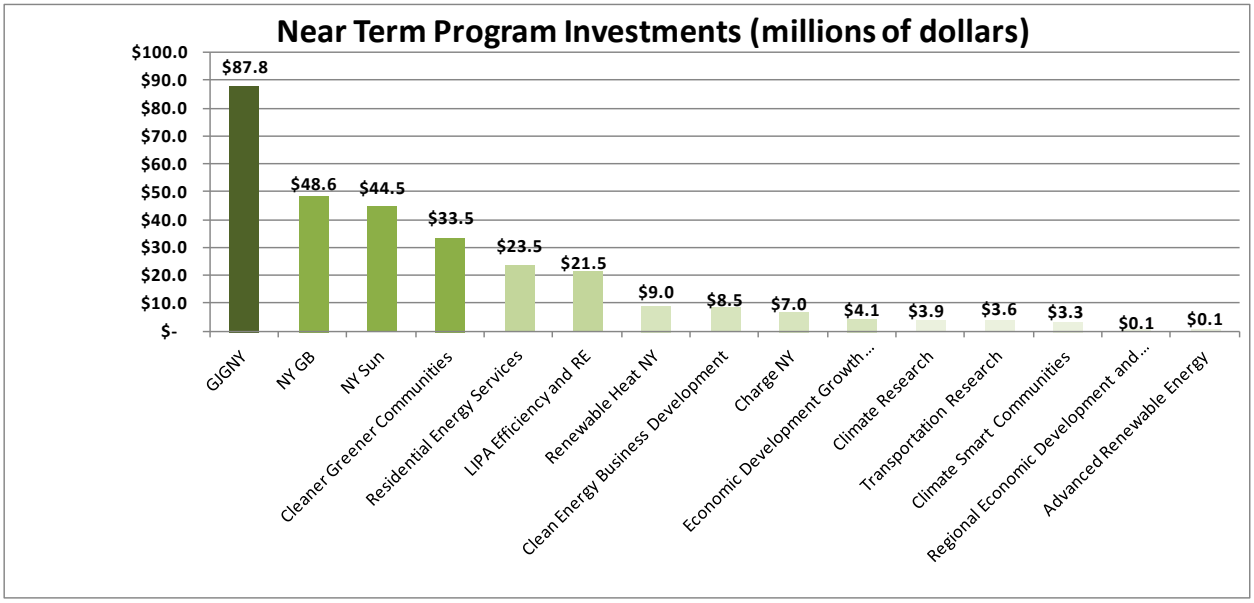
Table 2. Summary of Actual and Anticipated Funding Commitments from Revenues Collected Through Fiscal Year 2015-16

	Program	Actual Cumulative Allocation through March 2015	Planned Near-term Program Investments: Remaining Program Funds	Planned Near-term Program Investments: Planned FY 15/16 Proceeds	Estimated Total Funds Through FY 15/16
	Renewable Energy Subtotal	***$ 68,647,020***	***$ 17,328,574***	***$ 36,243,398***	***$ 104,890,418***
Renewable Energy	**Renewable Heat NY**	**$ 3,961,094**	**$ -**	**$ 8,955,830**	**$ 12,916,924**
Renewable Energy	**NY Sun***	**$ 56,472,431**	**$ 17,243,286**	**$ 27,287,568**	**$ 83,759,999**
Renewable Energy	Community/K-Solar	$ 9,499,999	$ 9,394,999	$ -	**$ 9,499,999**
Renewable Energy	Long Island Incentives	$ 36,972,431	$ 2,276,906	$ 17,287,568	**$ 54,259,999**
Renewable Energy	NYPA Customer Incentives	$ 10,000,001	$ 5,571,381	$ 10,000,000	**$ 20,000,001**
Renewable Energy	**NYSERDA PV**	**$ 5,319,821**	**$ -**	**$ -**	**$ 5,319,821**
Renewable Energy	**Advanced Renewable Energy**	**$ 2,893,674**	**$ 85,288**	**$ -**	**$ 2,893,674**
	Energy Efficiency Subtotal	***$ 140,040,884***	***$ 12,579,410***	***$ 32,457,854***	***$ 172,498,738***
Energy Efficiency	**LIPA Efficiency and Renewable Energy***	**$ 67,883,181**	**$ -**	**$ 21,535,569**	**$ 89,418,750**
Energy Efficiency	**Residential Energy Services**	**$ 70,912,461**	**$ 12,579,410**	**$ 10,922,285**	**$ 81,834,746**
Energy Efficiency	Multifamily Performance Program	$ 19,374,590	$ 1,982,937	$ 1,820,772	**$ 21,195,362**
Energy Efficiency	EmPower NY	$ 18,548,667	$ 3,295,558	$ 5,377,059	**$ 23,925,726**
Energy Efficiency	Home Performance with Energy Star	$ 18,430,427	$ 3,286,780	$ 3,724,454	**$ 22,154,881**
Energy Efficiency	Multifamily Carbon Emissions Reduction	$ 6,330,988	$ 491,260	$ -	**$ 6,330,988**
Energy Efficiency	Solar Thermal Incentive	$ 4,634,197	$ 3,390,412	$ -	**$ 4,634,197**
Energy Efficiency	Green Residential Buildings	$ 2,749,726	$ -	$ -	**$ 2,749,726**
Energy Efficiency	Low-Rise Residential New Construction	$ 843,866	$ 132,464	$ -	**$ 843,866**
Energy Efficiency	**Municipal Water/Wastewater**	**$ 1,245,242**	**$ -**	**$ -**	**$ 1,245,242**
	Innovative GHG Abatement Strategies Subtotal	***$ 77,245,629***	***$ 11,909,866***	***$ 11,068,919***	***$ 88,314,548***
Innovative GHG Abatement Strategies	**Industrial Innovations**	**$ 13,831,117**	**$ -**	**$ -**	**$ 13,831,117**
Innovative GHG Abatement Strategies	**Climate Research**	**$ 10,424,873**	**$ 2,690,564**	**$ 1,198,914**	**$ 11,623,787**
Innovative GHG Abatement Strategies	**Clean Energy Business Development**	**$ 24,601,065**	**$ 2,762,758**	**$ 5,745,005**	**$ 30,346,070**
Innovative GHG Abatement Strategies	**Charge NY**	**$ 4,000,000**	**$ 4,000,000**	**$ 3,000,000**	**$ 7,000,000**
Innovative GHG Abatement Strategies	**Transportation Research**	**$ 4,250,000**	**$ 2,456,544**	**$ 1,125,000**	**$ 5,375,000**
Innovative GHG Abatement Strategies	**Carbon Capture and Sequestration**	**$ 1,000,000**	**$ -**	**$ -**	**$ 1,000,000**
Innovative GHG Abatement Strategies	**Competitive Greenhouse Gas Initiative**	**$ 14,500,000**	**$ -**	**$ -**	**$ 14,500,000**
Innovative GHG Abatement Strategies	**Advanced Buildings**	**$ 4,638,574**	**$ -**	**$ -**	**$ 4,638,574**
	Community Clean Energy Subtotal	***$ 124,084,607***	***$ 32,113,998***	***$ 8,873,025***	***$ 132,957,632***
Community Clean Energy	**Climate Smart Communities**	**$ 6,034,999**	**$ 1,640,001**	**$ 1,640,000**	**$ 7,674,999**
Community Clean Energy	**Economic Development Growth Extension**	**$ 7,015,517**	**$ 2,254,122**	**$ 1,800,000**	**$ 8,815,517**
Community Clean Energy	**Cleaner Greener Communities***	**$ 100,634,091**	**$ 28,113,243**	**$ 5,433,025**	**$ 106,067,116**
Community Clean Energy	Incentives	$ 84,566,976	$ 24,553,080	$ 5,433,025	**$ 90,000,001**
Community Clean Energy	Implementation Contractor and Marketing	$ 6,708,629	$ 3,560,264	$ -	**$ 6,708,629**
Community Clean Energy	Planning	$ 9,358,486	$ -	$ -	**$ 9,358,486**
Community Clean Energy	**Regional Economic Development and GHG Reduction**	**$ 10,400,000**	**$ 106,632**	$ -	**$ 10,400,000**
	GJGNY Subtotal*	***$ 103,662,454***	***$ 7,807,969***	***$ 80,000,000***	***$ 130,662,454***
GJGNY	GJGNY Residential, One-to-Four Family	$ 58,536,971	$ 2,501,013	$ 80,000,000 $ (53,000,000)	$ 85,536,971
GJGNY	GJGNY Residential, Multifamily	$ 10,842,089	$ 2,631,873		$ 10,842,089
GJGNY	GJGNY - Small Business	$ 11,435,829	$ 808,835		$ 11,435,829
GJGNY	GJGNY Workforce	$ 7,337,565	$ 322,616		$ 7,337,565
GJGNY	GJGNY - Marketing & Outreach	$ 15,510,000	$ 1,543,632		$ 15,510,000
NY Green Bank	**NY Green Bank Subtotal***	***$ 48,563,992***	**$ 48,563,992**	$ -	**$ 48,563,992**
NY GATS	**NYS Generation Attribute Tracking System Subtotal**	***$ 1,509,357***	**$ -**	$ -	**$ 1,509,357**
	Grand Total	**$ 563,753,943**	**$ 130,303,809**	**$ 168,643,195**	**732,397,138**
Surplus/Deficit		***$ 23,509,348***	***$ -***	***$ (44,107,256)***	***$ (20,597,908)***
			OP PLAN TOTAL	**$ 298,947,004**	

* These programs represent long-term priorities, including legislativly mandated programs

Figure 1 shows a breakdown of the anticipated funding commitments for the near-term program investments presented in this Plan. Near-term program investments presented in this Plan totals approximately $298.9 million.

Figure 1. Breakdown of $298.9 Million in Near-term Program Investments Through Fiscal Year 2015-2016



2.4.6 Program Funding Expansion Plan and Additional Funds

The RGGI Operating Plan Amendments address the potential for auction revenues to exceed the estimates being used to develop the Operating Plan for each year. Allowance auction proceeds over the next year may exceed the revenue estimates presented in this Operating Plan. Absent unforeseen circumstances, if additional revenue should become available, proceeds could be used to reduce the fiscal year 2015/16 deficit or expand funding for the existing portfolio of RGGI programs to the extent consistent with Part 242, the CO_2 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, available on NYSERDA's website: http://www.nyserda.org/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Evaluations-of-Funds.aspx

The ensuing sections of this report provide the following information for each program that is anticipated to have near-term program investments:[15]

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

[15] The Statewide solar electric program and the Carbon Capture and Sequestration component of the Advanced Power Technology program are not described in this Plan because funds were encumbered prior to this Plan's planning horizon. Descriptions may be found in the 2010 version of the Plan. Additionally, the Municipal Wastewater, Competitive Greenhouse Gas Reduction pilot, Advance Power Technology, New York Generation Attribute Tracking System, Industrial Innovation, Advanced Buildings, Regional Greenhouse Gas Reduction program, and Green Residential Buildings programs are not described in this plan since funds were either encumbered prior to the current planning horizon, or were diminimus for purposes of this Plan. Descriptions may be found in the 2012, 2013, and 2014 versions of the Plan.

3 Renewable Heat NY

3.1 Program Description

Renewable Heat NY was announced by Governor Cuomo in his 2014 State of the State address as "a long-term commitment to help the high-efficiency and low-emission biomass heating industry reach scale." The Governor identified specific near-term actions to be taken as part of the initiative, including:

- Raise consumer awareness
- Develop larger-scale anchor customers to expand the bulk delivery market for wood fuel
- 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 Wood Heat Roadmap for New York to accelerate the use of the most efficient, low-emission technologies for biomass heating
- Identify high profile demonstration projects in state and municipal buildings that are ideally suited for biomass conversion
- Provide financial incentives to consumers (including residential, commercial, not-for-profit, and government) to reduce upfront costs, which will be phased down as the market achieves scale and upfront costs decrease
- Provide support so that sustainable forestry practices are available and followed by landowners.

In many key respects, developing this market will inherently require capturing the benefits of scale, and particularly of local scale. Installation and pellet supply economics will demonstrate an economic service radius effect; workforce development and customer awareness will show gains from local density. Consequently, this initiative will seek to develop clusters of activity in areas where wood is an economically attractive alternative to fossil fuels, rather than spread support evenly across all areas.

Renewable Heat NY will provide supply chain and service network development (i.e., workforce development, training, and research and development), along with consumer incentives and financing. These activities are not geared toward resource acquisition, but rather will position the market to become self-sustaining over the long term. As we continuously measure program success, our investments of incentives and staff resources will be reduced as the private market develops.

3.2 Benefits

Renewable Heat NY will accomplish the mission of the RGGI selection criteria in the following ways: reduced GHG emissions relative to oil heat alternatives, energy bill savings, and the creation or retention of jobs in New York.[16] The program will reduce New Yorkers' energy bills while providing significant environmental benefits. Included among these benefits are GHG reductions that stem from the replacement of fossil fuel heating devices, and public health benefits related to the replacement and recycling of outdoor and indoor wood boilers with advanced technology cord wood boilers and pellet boilers. Renewable Heat NY will also create and retain jobs in New York's biomass industry by supporting New York State manufacturers of high efficiency, low emissions wood heat technologies, and by providing needed training in hydronic biomass heating to qualify contractors and installers for the program.

The expected benefits of investing approximately $9.0 million in FY15-16 for the Renewable Heat NY program are presented in Table 3.

Table 3. Renewable Heat NY Expected Lifetime Benefits

Program[a]	Planned Period Budget ($ Million)	Number of Participants	Expected Lifetime Electricity Savings (MWh)	Expected Lifetime Natural Gas Savings (MMBtu)	Expected Lifetime # 2 Oil Savings (MMBtu)	Expected Lifetime #6 Oil Savings (MMBtu)	Expected Lifetime Other Fuel Savings (MMBtu)[a]	Expected Lifetime CO2 Reduction (Tons)[b]	Program Cost per Ton (Expected Lifetime)[c]
Renewable Heat NY	9.0	524	32,939	0	73,014	N/A	225,745	28,636	313

a Other fuel savings include savings from wood, propane, kerosene, steam and coal.

b Under a cap-and-trade system, the total number of CO_2 allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, renewable energy projects may not decrease the overall amount of CO_2 being emitted into the atmosphere by New York entities. Still, renewable energy projects will reduce end-users' carbon-footprints as they will be responsible for a smaller percent of the emissions associated with electricity production. See Appendix A for more detail.

c Cost per ton is based on the present value of all program costs (including initial incentives, program administration, and performance-based incentives) divided by the estimated lifetime GHG emissions reductions.

16 Calculated reductions in GHG emissions considers both the fuel being avoided and the new fuel being consumed.

4 NY-Sun

4.1 Program Description

The NY-Sun initiative, a dynamic public-private partnership, will drive growth in the solar industry and make solar technology more affordable for all New Yorkers. The program provides incentives for the installation of solar systems, promotes solar technology advancements, and works to reduce balance-of-system costs for solar electric (also known as photovoltaic or PV) installations. The NY-Sun initiative brings together and expands programs administered by NYSERDA, LIPA, and NYPA, to ensure a coordinated, well-funded statewide solar energy expansion plan, in an effort to drive growth in the solar electric industry and increase the affordability of solar electric technology. RGGI funds will be used to support multiple components of the NY-Sun program including NYPA and LIPA customer incentives, and the NYSERDA-administered Community Solar program described below. NYSERDA, LIPA, PSEG Long Island, and NYPA are collaborating to make the transition from previous successful solar programs and to add more than 3 gigawatts (GW) of installed solar capacity in the State by 2023.

4.1.1 Community Solar NY and K-Solar

Community Solar NY supports community projects across New York State that leverage aggregation, group purchasing, community shared solar and other strategies to make solar more accessible and affordable. The program supports projects organized by school districts, municipalities, nonprofit organizations, and other community institutions. In coordination with NYPA, K-Solar offers targeted resources to help schools implement solar and act as hubs for community solar projects.

4.1.2 Long Island Incentives

The NY-Sun Incentive Program provides solar electric system megawatt (MW) targets that vary by region and incentives that decline at a predictable rate over time. The program is managed by NYSERDA with local administration provided on Long Island by PSEG Long Island. Long Island Incentives aim to increase the number of solar electric systems across Long Island by stimulating the marketplace, so that costs associated with installing solar electric systems for residents and businesses are reduced. Additional incentives for low and moderate income (LMI) residential customers will increase access to solar and generate energy cost savings for LMI households.

4.1.3 NYPA Customer Incentives

Incentives are available for NYPA customers, which are mostly government buildings, municipalities, and schools across the State.

4.2 Benefits

The benefits associated with $445 million in FY15-16 for NY-Sun include increasing solar adoption, decreasing solar costs, integrating solar with other distributed energy resources, and building a sustainable clean energy economy in New York with resulting GHG reductions.

Of the total NY-Sun investments, the expected benefits of the $35.1 million in FY15-16 for Long Island Incentive and NYPA Customer Incentive programs are presented in Table 4.

Table 4. NY-Sun Expected Lifetime Benefits

Program	Planned Period Budget ($ Million)	Number of Participants	Expected Lifetime Electricity Savings (MWh)	Expected Lifetime Natural Gas Savings (MMBtu)	Expected Lifetime # 2 Oil Savings (MMBtu)	Expected Lifetime #6 Oil Savings (MMBtu)	Expected Lifetime Other Fuel Savings (MMBtu)[a]	Expected Lifetime CO2 Reduction (Tons)[b]	Program Cost per Ton (Expected Lifetime)[c]
NYPA Customer Incentives	$ 15.6	1,386	440,190	N/A	N/A	N/A	N/A	137,559	$ 113
Long Island Incentives	$ 19.6	1,742	1,199,321	N/A	N/A	N/A	N/A	374,788	$ 52
Total	**$ 35.1**	**3,129**	**1,639,511**	**N/A**	**N/A**	**N/A**	**N/A**	**512,347**	**$ 69**

a Other fuel savings include savings from wood, propane, kerosene, steam and coal.

b Under a cap-and-trade system, the total number of CO_2 allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, renewable energy projects may not decrease the overall amount of CO_2 being emitted into the atmosphere by New York entities. Still, renewable energy projects will reduce end-users' carbon-footprints as they will be responsible for a smaller percent of the emissions associated with electricity production.

c Cost per ton is based on the present value of all program costs (including initial incentives, program administration, and performance-based incentives) divided by the estimated lifetime GHG emissions reductions.

The benefits provided by Community Solar NY specifically will be evaluated using the following metrics: increased solar deployment and soft cost reduction, associated deployment of non-solar distributed energy resources, and non-energy benefits, including economic development. Increased deployment of solar electric and other DER will be measured in terms of new solar electric/DER directly

facilitated by participating community projects as compared to market expansion in comparable geographies over the same time period. The first round of projects funded through Community Solar NY will conclude by December 2015. Preliminary benefits from the first round will be quantified at this time, with benefits finalized upon completion of all associated solar electric installations by the end of Q2 2016.

The benefits provided by additional incentives for LMI residential customers will be evaluated using the following metrics: increased solar deployment among income-qualified customers, and energy cost savings to LMI customers.

5 LIPA Efficiency and Renewable Energy

5.1 Program Description

The current LIPA Efficiency and Renewable Energy program allocation will be used to enhance the ability of the Long Island Power Authority (LIPA) to provide energy efficiency and renewable energy services to LIPA customers in accordance with the approved LIPA budget. As the LIPA Solar Pioneer and Solar Entrepreneur PV incentive programs transitioned to a statewide solar electric program through NY-Sun in 2014, these RGGI funds will be used primarily for energy efficiency programs administered by PSEG Long Island that are consistent with PSEG-Long Island's clean energy programs and Reforming the Energy Vision plan. These residential and commercial energy efficiency projects may include efficient lighting, air conditioning, and other ENERGY STAR® appliances in existing buildings as well as in new construction. These funds may also be used to support renewable energy projects, including solar electric projects not eligible for incentives through NY-Sun.

5.2 Benefits

Consistent with the RGGI program selection criteria, this program is designed to reduce customer electric bills while providing significant environmental benefits including reduction of GHGs. The benefits of $21.5 million in program investments for FY15-16 are presented in Table 5.

Table 5. LIPA Efficiency and Renewable Energy Expected Lifetime Benefits

Program	Planned Period Budget ($ Million)	Number of Participants	Expected Lifetime Electricity Savings (MWh)	Expected Lifetime Natural Gas Savings (MMBtu)	Expected Lifetime # 2 Oil Savings (MMBtu)	Expected Lifetime #6 Oil Savings (MMBtu)	Expected Lifetime Other Fuel Savings (MMBtu)[a]	Expected Lifetime CO2 Reduction (Tons)[b]	Program Cost per Ton (Expected Lifetime)[c]
LIPA Efficiency and Renewable Energy	$ 21.5	1,918	800,914	N/A	N/A	N/A	N/A	250,285	$ 86

a Other fuel savings include savings from wood, propane, kerosene, steam and coal.

b Under a cap-and-trade system, the total number of CO_2 allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, renewable energy projects may not decrease the overall amount of CO_2 being emitted into the atmosphere by New York entities. Still, renewable energy projects will reduce end-users' carbon-footprints as they will be responsible for a smaller percent of the emissions associated with electricity production.

c Cost per ton is based on the present value of all program costs (including initial incentives, program administration, and performance-based incentives) divided by the estimated lifetime GHG emissions reductions.

6 Residential Efficiency Services Program

6.1 Program Description

NYSERDA currently offers a suite of programs providing comprehensive energy-efficiency services for single and multifamily existing buildings and new construction, including low-income households. In addition to energy savings, these programs provide significant health and safety benefits through comprehensive testing and verification, improved air quality, and improved comfort. Through December 31, 2015, EEPS-Electric funding for these programs is available for achieving electric savings, and EEPS-Gas funding for these programs provides the opportunity to address certain energy-efficiency measures, such as heating systems, for customers who heat with natural gas. Home heating accounts for 30 to 40 percent of household energy costs, and improvements to heating and building shell systems can provide four times the energy cost savings of electric measures that consist primarily of lighting and appliance replacements. It is anticipated that beginning January 1, 2016 the proposed Clean Energy Fund will be used to support similar activities that are expected to continue in the residential sector.

NYSERDA will use RGGI funds for fossil-fuel based measures and renewable energy measures not eligible for EEPS incentives. Coordination of these funding sources will expand the number of households served and ensure that opportunities for carbon reduction measures are not lost.

RGGI funds will also be used to provide fossil-fuel efficiency programs for those not currently served by NYSERDA's programs due to funding restrictions, such as LIPA and NYPA customers and electric service customers of municipal electric providers. In the event that natural gas funding is not available, NYSERDA will use RGGI funding to support natural gas efficiency measures.

The following programs are near-term, cost-effective programs that have significant technical potential for reducing GHGs in the residential sector. These programs will seek to address environmental justice issues by directly targeting outreach to environmental justice communities and working with community-based organizations that address environmental justice issues by referring them to appropriate programs.

6.1.1 Multifamily Performance Program

The Multifamily Performance Program (MPP), serves buildings with five or more units. Existing MPP consulting firms, known as "Partners" in the program, will use the program's benchmarking tools, templates, and various auditing software packages to determine what energy improvements are cost-effective, their expected energy savings, and the costs to install them. The energy audits that are developed, known as Energy Reduction Plans (ERPs) in the program, identify the measures needed to reduce energy use by at least 15 percent.

RGGI funding will be used to reduce non-firm gas, oil and propane in multifamily buildings by providing incentives to repair and replace space and domestic water heating systems as well as installing insulation, air sealing, and other building shell energy efficiency measures. Electric reduction measures, including ENERGY STAR® lighting and refrigerators, will be provided using EEPS funding in buildings eligible for those services.

Electric customers of LIPA, NYPA, and municipal electric providers will receive services for oil efficiency, including heating and shell measures, if not provided by their utility. NYSERDA will consider providing gas efficiency services through RGGI funds once EEPS funding targeting gas measures has been exhausted. NYSERDA will coordinate closely with the Weatherization Assistance Program to ensure the most effective use of both funding sources.

Approximately one-third of the multifamily buildings in New York State are heated with fossil fuels. NYSERDA proposes to service an estimated 2,000 low-income units and about 13,200 market rate units over the three-year period, assuming EEPS funds are adequate to continue addressing the electric efficiency needs of those buildings.

6.1.2 EmPower New York

EmPower New York provides energy efficiency services for low-income New Yorkers. RGGI funds are primarily targeted to households heating with oil, propane, kerosene, wood or coal, but may also be applied to homes heating with natural gas, when EEPS-gas funding is not available. RGGI funds energy efficiency measures that reduce carbon emissions, such as insulation, air sealing, and heating system upgrades.

The RGGI-funded services are available Statewide. Households served with RGGI funding are also provided with energy efficiency measures through EEPS-electric funding in the territories of utilities participating in SBC. Households may apply directly to the program, or may be referred through utilities, Offices for the Aging, Departments of Social Services, and other community-based organizations; NYSERDA will continue to coordinate services with the Weatherization Assistance Program (WAP) whenever possible, to ensure effective use of both funding sources.

6.1.3 Home Performance with ENERGY STAR®

Home Performance with ENERGY STAR® (HPwES®) is a comprehensive energy efficiency services program for existing one- to-four family homes. The program uses a network of service providers accredited by the Building Performance Institute (BPI) to perform diagnostic testing on homes, recommend improvements, determine the payback period for those improvements, and install improvements selected by the homeowner. RGGI funding will allow HPwES to target customers using oil and propane for space and domestic water heating purposes. The funds will offset part of the cost for consumers to replace inefficient oil and propane heating equipment and other measures that have a direct impact on reducing oil and propane consumption (e.g., insulation, air sealing). Income-eligible customers receive additional incentives, up to 50% of the cost of eligible measures, through Assisted HPwES.

Eligible electric measures for HPwES will be covered by EEPS funds within the SBC territory. NYSERDA is coordinating with LIPA, NYPA, and municipal electric service providers to offer these heating efficiency services to their customers. In the event gas funds are not available, NYSERDA may expand use of RGGI funds to heating equipment.

HPwES and Assisted HPwES are delivered in coordination with Green Jobs-Green New York, described later in this Plan.

6.1.4 Solar Thermal Incentive Program

RGGI funds will support incentives for the installation of solar thermal systems to replace fossil-fuel domestic hot water systems. RGGI funds may be used to support the installation of residential and non-residential solar thermal systems. Incentives are applied to the total project cost based on displaced kWh. Combination systems (systems that provide domestic hot water (DHW) and space heating) are allowed in the Program; however, incentives are only provided on the portion of the solar thermal system output that offsets DHW production.

6.1.5 Low-rise Residential New Construction Program (LRNCP)

Formerly known as New York ENERGY STAR™ Certified Homes (NYESCH), NYSERDA's Low-rise Residential New Construction Program (LRNCP) incorporates the New York ENERGY STAR® Certified Homes Program as well as the alternative New York Energy $mart designation for gut rehabilitation projects. These Programs are designed and intended to encourage the construction of single-family homes and low-rise residential dwelling units which operate more energy efficiently, are more durable, more comfortable, and provide a healthier environment for their occupants than would otherwise be achieved. Technical assistance and financial incentives are offered to builders and developers, as well as to Residential Energy Services Network (RESNET) Home Energy Rating System (HERS) Providers and their Home Energy Raters to encourage the adoption of progressive building practices among professional homebuilders and developers while stimulating permanent consumer demand for dwellings that are significantly more energy-efficient than code-built homes. Higher incentives are now available, with eligibility based on the achievement of increased levels of energy performance, up to and inclusive of homes which are designed to achieve net zero energy performance through on-site production of at least as much energy as will be used in a year.

LRNCP requires a minimum annual kWh usage reduction, typically achieved through the installation of ENERGY STAR® qualified heating and cooling equipment, appliances, lighting, and electronically-commutated motors in HVAC equipment. LRNCP also require combustion appliance safety testing, and additionally mandates minimum building shell tightness standards, properly sized heating and cooling systems, proper ventilation to ensure indoor air quality, ENERGY STAR®-qualified appliances, and high-efficacy lighting. The installation of a solar photovoltaic system, sized to offset the use of grid produced energy at the site, is required on homes that are applying for the highest incentive levels offered by LRNCP, intended to support net zero energy performance. RGGI funds are used, in combination with EEPS electric funding, when oil or propane will be used as the primary heating fuel. This primarily occurs in geographic areas that do not have access to natural gas utility service.

6.2 Benefits

Consistent with the program selection criteria, the Residential Efficiency Services initiatives support:

- The cost-effective reduction of GHGs.
- Other benefits to New York by leveraging RGGI funds with existing electric reduction programs funded through SBC and other sources, participates will realize more annual energy bill savings than when only electric measures are installed.
- Opportunities to reduce the disproportionate cost burden and environmental impacts on low-income families and environmental justice communities.

Table 6 presents anticipated fuel savings, CO_2 reductions, and program cost per CO_2 ton reduced over the lifetime of the installed measure resulting from $23.5 million in program investments for FY 15-16.

Table 6. Residential Efficiency Services Program Expected Lifetime Benefits

Program	Planned Period Budget ($ Million)	Number of Participants[a]	Expected Lifetime Electricity Savings (MWh)	Expected Lifetime Natural Gas Savings (MMBtu)[b]	Expected Lifetime # 2 Oil Savings (MMBtu)[b]	Expected Lifetime #6 Oil Savings (MMBtu)	Expected Lifetime Other Fuel Savings (MMBtu)[b,c]	Expected Lifetime CO2 Reduction (Tons)[d]	Program Cost per Ton (Expected Lifetime)[e]
Multifamily Performance Program	$ 3.8	6,083	28,684	142,510	1,590,116	N/A	133,946	156,381	$ 24
MPP Market Rate	$ 2.4	3,893	18,358	91,206	1,017,674	N/A	85,726	100,084	$ 24
MPP Low Income	$ 1.4	2,190	10,326	51,304	572,442	N/A	48,221	56,297	$ 24
Multifamily Carbon Emission Reduction Program[f]	$ 0.5	1,822	N/A	(2,641,998)	(139,053)	2,781,050	N/A	65,086	$ 8
EmPower New York	$ 8.7	2,126	N/A	144,536	972,270	N/A	254,211	105,512	$ 82
Home Performance with ENERGY STAR	$ 7.0	1,334	10,301	(332,602)	2,843,688	N/A	104,554	215,915	$ 32
HP Market Rate	$ 3.2	614	4,739	(152,997)	1,308,096	N/A	48,095	99,321	$ 32
HP Low Income	$ 3.8	720	5,563	(179,605)	1,535,591	N/A	56,459	116,594	$ 32
Low-rise Residential New Construction Program	$ 0.1	65	1,971	N/A	N/A	N/A	57,689	4,566	$ 29
Solar Thermal Incentive Program	$ 3.4	361	N/A	50,883	111,984	N/A	53,460	15,811	$ 214
Total	**$ 23.5**	**11,791**	**40,957**	**(2,636,671)**	**5,379,005**	**2,781,050**	**603,860**	**563,272**	**$ 42**

a The number of participants in the multifamily residential sector represents individual units rather than buildings.

b Some programs experience an increase in fuel usage due to fuel switching projects and interactive effects from certain measures. Interactive effects may include increased demand for heating fuel as a result of switching lighting technology; for example, if a switch to fluorescent lighting eliminates associated resistive heating from incandescent lighting.

c Other fuel savings include savings from wood, propane, kerosene, steam and coal.

d These emission reductions are associated with both electric and fossil-fuel saving measures. Under a cap-and-trade system, the total number of CO_2 allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, electric-efficiency projects may not decrease the overall amount of CO_2 being emitted into the atmosphere by New York entities. Still, electric-efficiency projects will reduce end-users' carbon footprints as they will be responsible for a smaller percent of the emissions associated with electricity production.

e Cost per ton is based on the present value of all program costs (including initial incentives, program administration, and performance-based incentives) divided by the expected lifetime GHG emissions reductions.

f This program is expected to support the switching of residual fuel oil to lower carbon fuels, which may cost more per delivered unit of energy. The potential additional cost to consumers associated with this fuel switching has not been included in the program metrics.

7 Climate Research and Analysis

7.1 Program Description

Since its inception, the Climate Research and Analysis program has significantly increased the understanding and awareness of the environmental impacts of energy choices and emerging energy options. It continues to provide a scientific foundation for formulating effective, equitable, energy-related environmental policies and resource management practices that can both reduce GHG emissions and guide strategies to prepare for a changing climate. The program builds upon the environmental research capabilities in New York State, and addresses critical climate change-related issues facing the State and the region, including the needs of environmental justice communities, and creates opportunities for innovation. This program supports research studies, demonstrations, policy research and analyses, and outreach and education efforts related to the following questions:

- What are the most cost-effective greenhouse gas mitigation strategies for New York?
- What are the key parameters that need to be monitored to establish baselines and assess climate change impacts in New York?
- What are the current and predicted impacts of climate change to energy, transportation, telecommunications, water resources, coastal zones, ecosystems, agriculture, public health and the built environment in New York State, and how can the associated risks be cost-effectively managed and minimized? Additionally, what opportunities exist to take advantage of opportunities related to a changing climate?

7.2 Benefits

The benefits of the program are:

- Informing decisions related to reducing the cost of achieving the emission reduction goals of local, state, and regional programs.
- Evaluating and documenting health and environmental impacts and opportunities.
- Guiding initiatives designed to reduce the disproportionate cost burden and environmental impacts on low-income families and environmental justice communities.

The nature of the Climate Research and Analysis program does not lend itself to tracking traditional quantifiable benefits such as GHG reductions. Nevertheless, there are real benefits that can be quantified in terms of numbers of critical research studies completed; publications; thought leadership summits held, such as conferences, workshops, and seminars; topical briefings provided; and the leveraging of funding

sources that might not be available but for the cost-sharing opportunities presented through RGGI proceeds. Also tracked will be climate change-related policies and initiatives in New York State that are informed by program products.

Table 7 presents the anticipated quantitative benefits associated with the investment of $3.9 million in the Climate Research program through FY15-16.

Table 7. Climate Research and Analysis Program – Anticipated Benefits

Climate Research	Projected Total Associated with Funds Described for this Planning Horizon
Research Studies	13
Publications	13
Conferences, Workshops, and Seminars	6
Briefings	12
Funds Leveraged	$1,126,865

8 Clean Energy Business Development

8.1 Program Description

The Clean Energy Business Development (CEBD) program seeks to create, attract, and grow industries in New York that can benefit from emerging business opportunities in clean energy and environmental technologies while supporting the goal of carbon mitigation. Key elements of the program include:

- Providing financial support to leverage private investment in early-stage and expansion-stage clean energy companies in New York and accelerate the market introduction of innovative energy efficiency, renewable energy, or carbon abatement technologies. Emphasis will be placed on early-stage and pre-revenue companies with high-growth potential. Implementation may mirror the process used by private and public seed or venture funding organizations with transparent decision criteria and evaluation/recommendations by qualified investment professionals.
- 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. The program is expected to maximize product competitiveness by identifying and capturing cost saving opportunities associated with production.
- Develop and support a portfolio of programs designed to translate clean energy technology research into commercially viable business enterprises. This portfolio could include programs targeting the commercialization of academic, private, and public research; primary and secondary research on customer demand from the manufacturer to the end-user; technical and financial support to move new energy technologies to the point of commercial-scale manufacturing; cooperative programs to support the commercial introduction of new clean energy technologies; and, other programs that increase the likelihood of commercial success for clean energy technologies that are beneficial to New York State.
- Establishing a Photovoltaic Manufacturing Consortium (PVMC) to coordinate a multi-faceted industry-driven collaborative R&D initiative to advance copper indium gallium selenide (CIGS) manufacturing process, tools, and materials. The PVMC has established a CIGS manufacturing development facility in Albany, NY that solar electric companies and researchers can use for product prototyping, demonstration, and pilot-scale manufacturing. This facility will allow users to evaluate and validate the CIGS technologies they develop without investing in costly prototyping equipment themselves, which will reduce the cost and risk of developing commercial CIGS-based solar electric products.
- Launching a clean energy business competition in the Southern Tier that will leverage the region’s advanced manufacturing and technology development capabilities to attract promising investment and innovative ideas from around the world. This competition will not only provide prizes to outstanding companies that locate in the region, but also catalyze a vibrant and growing clean energy industry.

8.2 Benefits

The CEBD provides the following benefits:

- Invests in businesses involved with technologies that have long-range potential to reduce GHG emissions in New York.
- Partners with firms to move new technologies from the development stage to the manufacturing stage.
- Supports the growth of ecosystems across New York State to support and mentor clean energy entrepreneurs
- An annual clean energy business model competition to attract new businesses to New York State, with a focus on the Southern Tier, and scalable clean energy businesses already in the region
- Provides other benefits to New York, such as the potential to create jobs, leverage capital investment to promote clean energy economic development.

Table 8 presents anticipated quantifiable benefits associated with the investment of $8.5 million in the program portfolio for FY15-16.

Table 8. Clean Energy Business Development Program – Anticipated Benefits

Clean Energy Business Development Funding Benefits	Projected Total Associated with Funds Described for this Planning Horizon
Clean Energy Businesses and service providers participating in programs/events	75
Start-ups Receiving Support	45
Funds Leveraged	$5,000,000

9 ChargeNY

9.1 Program Description

With RGGI funding for ChargeNY initiative, NYSERDA will pursue two main strategies to promote plug-in electric vehicle (PEV) adoption. First, NYSERDA will support a collaborative, partner-driven engagement campaign targeting employers, car dealers, retailers, and the general public to engender greater support for PEVs and educate potential PEV and PEV infrastructure buyers about their options. The goal of the program will be to engage stakeholders to get involved with supporting PEV adoption in ways that support their interests and to demonstrate sustainable marketing strategies to the general public that are enhanced through partnerships. Initial investments will include a pilot program for encouraging car dealers to increase PEV sales and a recognition program for workplaces across the State. This is a key aspect of encouraging PEV deployment that has been lacking and one that is essential to spur more private investment in PEV purchases and PEV charging stations.

Second, NYSERDA will initiate a program to bring down the price of installing PEV charging stations through bulk purchasing. NYSERDA will negotiate favorable pricing with qualified vendors and installers and invite public and private site owners to take advantage of these reduced costs for charging stations. NYSERDA expects to see lower equipment prices and lower installation prices through aggregated installations and more efficient techniques. NYSERDA will provide additional financial support for the installation of PEV charging stations at location types that have been seen to be effective drivers for PEV adoption based on usage data reported from previous installations, such as workplaces, municipal lots, and multi-family buildings.

9.2 Benefits

The ChargeNY Program will provide significant environmental benefits including the reduction of GHG emissions through the displacement of petroleum use. The anticipated portfolio will have an array of projects dealing mainly with on-road transportation concentrating on PEVs and their associated charging infrastructure. The increase in the installation of charging infrastructure across the State will help reduce the “range anxiety” for potential PEV owners thus spurring an increase in PEV acquisitions. The anticipated benefits associated with the investment of $7 million in the ChargeNY program through FY15-16 are presented in Table 9.

Table 9. ChargeNY - Anticipated Benefits

ChargeNY Funding Benefits	Projected Total Associated with Funds Described for this Planning Horizon
Funds Leveraged	$ 5,000,000
Publically Accessible EV Charging Stations	400
Additional PEVs purchased	600
Consumer engagement campaigns	3
Partnerships launched	3

10 Transportation Research

10.1 Program Description

Vehicle tailpipe emissions are the largest single contributor to urban air pollution and are the source of 40% of fossil-fuel generated GHG emission in New York State.[17] The goal of the Advanced Transportation Development program is to develop and increase the availability of improved technologies, products, systems, and services that provide cost-effective GHG reductions from the transportation sector. The program will support the development of transportation products, with a focus on developing and demonstrating emerging technologies that enhance the operation and market adoption of public transportation, smart mobility, transportation demand management, and alternative fuel vehicle solutions. This includes technologies that improve vehicle efficiency and projects that improve efficiency through planning, policy, or vehicle optimization. The Advanced Transportation Development program focuses on technologies and systems that can provide significant, and often unique, benefits to New York's transportation system. The RGGI funds will leverage and fill gaps in state and federal funding including Department of Transportation Congestion Mitigation and Air Quality Program, Department of Energy, and SBC Technology & Market Development funds.

10.2 Benefits

The Transportation Research program coincides with the program selection criteria in the following ways:

- Invests in technologies and systems with significant potential for reducing GHGs in New York.
- Provides other benefits, specifically related to air quality and environmental justice. Vehicle and infrastructure projects lower operating costs for public entities such as schools, municipalities, and public transit agencies.
- Develops and demonstrates products and services that increase the effectiveness of existing systems.
- Construction of cutting-edge infrastructure can encourage innovations and progress in the electrification of transportation.
- Provides funding for these initiatives that do not receive adequate support from other funding sources.
- Businesses often see savings in association with reduced fuel usage. Citizens will reap similar benefits, or have commercial savings passed down to them in the long term.
- Alternative fuel and transportation mode choices buffer fuel price fluctuations.

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[17] Patterns and Trends: New York State Energy Profiles: 1998-2012, p.12. http://www.nyserda.ny.gov/-/media/Files/Publications/Energy-Analysis/1998-2012-patterns-and-trends-report.pdf.

- Reduced fuel usage, modes of transit, and optimization schemes help increase the resiliency of the transportation network, such as having electric vehicles during a gasoline shortage.
- Many secondary benefits, such as reduction in travel time and fuel switching.

For demonstration projects, there will be fuel and emissions savings, and for product development efforts, there will be outcomes such as patents, license agreements, and sales. The current portfolio has an array of projects mainly dealing with on-road transportation and concentrating on vehicles, infrastructure, logistics, and fuel. Table 10 summarizes the benefits associated with the investment of $3.6 million in research funding through FY15-16.

Table 10. Transportation Research - Anticipated Benefits

Transportation Research Funding Benefits	Projected Total Associated with Funds Described for this Planning Horizon
Funds Leveraged	$3,000,00
NY Companies Receiving Support	12
Start-ups Receiving Support	3
Products developed	3
Patents	4
Product sales	$400,000

11 Cleaner, Greener Communities

11.1 Program Description

The Cleaner, Greener Communities (CGC) program was announced by Governor Cuomo in his 2011 State of the State address; the program is fully funded for $106 million, after the addition of $33.5 through FY15-16. It builds on the Climate Smart Communities (CSC) program, providing enhanced support for development and implementation of regional sustainability plans to help ensure that the State's ongoing and substantial investments in infrastructure help to move communities and New York as a whole toward a more environmentally sustainable future. The program encourages communities to use public-private partnerships and develop regional sustainable growth strategies in areas such as emission control, energy efficiency, renewable energy, low-carbon transportation, and other GHG reductions. The program emphasizes activities associated with smart growth, support for electric vehicles, creation of green jobs, building green infrastructure, investing in environmental justice communities, and strengthening environmental protection.

The program has two primary components: Phase I was the development of regional sustainable growth plans, and Phase II is implementation of elements of the sustainability plans. Ten region-specific planning teams were competitively selected under Phase I to develop a plan for each of the State's 10 Regional Economic Development Council regions. Approximately 10 percent of the budget was made available during Phase 1 for communities to develop regional sustainability plans to reduce GHG pollution and improve residents' health and quality-of-life. The remaining 90 percent of the budget is being used to support the Phase II implementation component of the program to implement individual projects related to the plans' goals that will result in immediate and long-lasting GHG emission reductions and enhance community climate resiliency. Projects that have garnered community acceptance and approval, as well as projects that include public-private partnerships, are encouraged. Consideration is given to support implementation projects in multiple types of communities (i.e., rural, suburban, and urban communities). RGGI proceeds will only be used for the implementation of plan elements that fall within the scope of the permissible use of RGGI proceeds. The first and second round solicitations for Phase II funding were released and awarded in 2013 and 2014, respectively. NYSERDA awarded approximately $60 million to 91 projects across the state. The third and final round solicitation to select projects for Phase II funding was released in May 2015 and proposals were received in July 2015. NYSERDA expects to announce

awards in Fall 2015. Two components of the third round, Category 1 (incentives for communities adopting streamlined permitting for photovoltaic systems and electric vehicle supply equipment) and Category 2 (flexible funding pilots for municipal sustainability projects, many of which are complementary to actions encouraged by the CSC program), will remain open until funding is exhausted.

CGC program implementation support is being provided by a competitively selected contractor.

Outreach and community support for the CGC is provided in part through CSC and the Economic Development Growth Extension (EDGE) programs. CSC provides technical assistance and guidance to communities participating in the CSC program, helping them to plan for and implement actions that reduceGHG emissions and support climate resiliency. EDGE provides regionally-based outreach and education, along with local matchmaking and project building support in an effort to stimulate interest and spur action in projects that promote sustainable economic development.

To ensure that support for community sustainability initiatives continues after CGC funds are no longer available, NYSERDA, through the third and final round of the CGC program, solicited regionally-based outreach and technical assistance services, replacing the current contractors under both CSC and EDGE, and incorporating lessons learned from each. NYSERDA anticipates soliciting additional services in 2016 through the Clean Energy Fund to cover any regions for which awards are not made through CGC.

This statewide program will support the Governor's recently announced, interagency New York State Communities Partnership (NYSCP) by providing resource-strapped local governments with a common platform and coaching, facilitation, technical assistance, and expertise for implementing the local-level policies and planning needed to drive future clean energy- and climate-related activities toward GHG abatement and sustainable growth. These local-level actions help to deliver the regional sustainable growth strategies encouraged by the CGC program, consistent with the regional sustainability and economic development plans.

11.2 Benefits

The Cleaner, Greener Communities program reduces GHG emissions and enhances local planning through implementation of the regional sustainability plans. The regional sustainability plans provided baseline GHG inventories and described long-term and short-term sustainability goals for each region. These goals include GHG reductions and sustainability goals for energy supply, transportation, water management, waste management, land use, open space, agriculture, housing, and economic development. The plans identify the most effective opportunities for achieving GHG reductions, energy-efficiency savings, and renewable energy deployment; and include appropriate metrics that will be used to measure GHG reduction progress and co-benefits such as job creation and energy savings. Implementation funding is being provided on a competitive basis for specific projects that provide the greatest opportunities for achieving GHG reductions, energy-efficiency savings, and renewable energy deployment consistent with regions' sustainability plans and Regional Economic Development Council (REDC) Strategic Plans. Although additional, unique benefits will be tracked for many projects, the following benefits listed in Table 11 will be tracked for all projects. Benefits will be estimated at the beginning of a project and refined at the end, with changes in benefits over time projected out for periods of 5, 15, and 30 years post project completion.

Table 11. Cleaner, Greener Communities Program Benefits

Cleaner Greener Communities Program Benefit	Unit
GHG Emissions Savings / year	$MTCO_2e$/year
Total Conventional Energy Savings	MMBTU
Conventional Energy Cost Savings	$
Permanent Jobs Created	number
NYSERDA CGC Investment (funding requested)	$
Investment by Others l(matching and leveraged)	$

To date, three types of projects were awarded (eligible) under the first and second solicitations for Phase II funding including:

Category 1: Photovoltaic and Electric Vehicle Supply Equipment Permitting Incentive Applications
Category 2: Planning Initiatives (comprehensive planning, zoning amendments, pre-development technical assistance for capital projects, and other innovative planning-related initiatives)
Category 3: Community-Scale Sustainability Projects (projects that are innovative and transformational in their contributions to advancing sustainable development; thereby creating direct community benefit and reduction of carbon emissions. Project types include showcase or anchor construction projects, as well as innovative projects or programs that stimulate market transformation)

Of the projects awarded under the first and second rounds of Phase II, the following benefits listed in Table 12 are projected to accrue. Additional benefits will be projected as projects progress/mature.

Table 12. Anticipated Benefits of CGC Project Phase II Rounds 1 and 2

Metric Tons of Carbon saved per year (Direct)	Metric Tons of Carbon saved per year (Leveraged)	Total Metric Tons of Carbon saved per year	Cumulative over 20 years
192,188	134,595	326,783	6,535,664

12 Green Jobs - Green New York

12.1 Program Description

Green Jobs – Green New York (GJGNY) provides funding for energy assessments, financing for energy upgrades, and technical and financial support to develop a green-collar workforce. GJGNY is a statewide effort to strengthen New York State communities through energy efficiency. It enables New Yorkers to make a significant difference in our homes, businesses and neighborhoods – making them more comfortable, more sustainable, and more economically sound. GJGNY is administered by NYSERDA and made available by the Green Jobs – Green New York Act of 2009. NYSERDA supports a broad range of education and training program aimed at creating an experienced clean energy workforce. Participants gain the skills and credentials needed to meet the demand for energy efficiency, renewable energy technologies, and support the state's growing clean energy economy. Through public-private partnerships, NYSERDA Workforce Development Programs fund the development and delivery of cutting-edge training programs, and provide financial support to those who wish to pursue new career training, professional certifications and critical on-the-job training. Please refer to the Green Jobs-Green New York Reports for more details. (http://www.nyserda.ny.gov/About/Green-Jobs-Green-New-York/GJGNY-Advisory-Council-Reports)

12.2 Benefits

The GJGNY Program often serves as a point of entry into existing energy-efficiency programs for prospective projects through the audit and financing offerings. It is anticipated that a portion of these projects will proceed through a GJGNY-funded audit or loan and without additional incentives from NYSERDA or another Program Administrator(s It is extremely difficult to predict how much implementation of audit recommended measures will go through incentive programs previously identified and to quantitatively identify attribution to each source of funding or support provided. Therefore, reporting on each respective portfolio of coordinating programs such as RGGI/GJGNY and EEPS will show the full benefits contributed to by each funding source, and NYSERDA-wide reporting will ensure there is no double counting. Therefore, the Plan does not attempt to disaggregate savings by funding source. Table 13 presents anticipated fuel savings, CO_2 reductions, and program cost per CO_2 ton reduced over the lifetime of the installed measure.

Table 13. Green Jobs - Green New York Program - Expected Lifetime Benefits

Benefits for the Green Jobs, Green New York Program were calculated for Residential and Small Commercial programs only. No benefits are calculated for Workforce Development or Marketing and Outreach related funds.

Program[a]	Planned Period Budget ($ Million)	Number of Participants[b]	Expected Lifetime Electricity Savings (MWh)	Expected Lifetime Natural Gas Savings (MMBtu)	Expected Lifetime # 2 Oil Savings (MMBtu)	Expected Lifetime #6 Oil Savings (MMBtu)	Expected Lifetime Other Fuel Savings (MMBtu)[c]	Expected Lifetime CO2 Reduction (Tons)[d]	Program Cost per Ton (Expected Lifetime)[e]
Residential	$ 85.1	116,425	367,053	9,938,370	16,530,383	N/A	526,304	2,063,286	$ 41
Residential - One-to-Four Family	$ 82.5	107,936	298,170	9,004,980	16,224,069	N/A	511,444	1,961,023	$ 42
Residential - MultiFamily	$ 2.6	8,488	68,883	933,390	306,314	N/A	14,861	102,263	$ 26
Small Business	$ 0.8	155	9,544	125,814	3,430	N/A	N/A	10,632	$ 76
Total	**$ 85.9**	**116,580**	**376,597**	**10,064,184**	**16,533,813**	**N/A**	**526,304**	**2,073,918**	**$ 41**

a Projects that receive GJGNY-supported audits and/or financing may also receive incentives through the System Benefits Charge (SBC), Energy Efficiency Portfolio Standard (EEPS), Regional Green House Gas Initiative (RGGI), and/or utility programs, such that the projects' energy savings may not all be attributable solely to GJGNY. For the purpose of this Operating Plan, the potential savings associated with all projects is shown (after applying an adjustment factor to account for the anticipated implementation rate). No savings are estimated for the financing portions of these programs.

b The number of participants in the multifamily residential sector represents individual units rather than buildings.

c Other fuel savings include savings from wood, propane, kerosene, steam and coal.

d These emission reductions are associated with both electric and fossil-fuel saving measures. Under a cap-and-trade system, the total number of CO_2 allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, electric-efficiency projects may not decrease the overall amount of CO_2 being emitted into the atmosphere by New York entities. Still, electric-efficiency projects will reduce end-users' carbon footprints as they will be responsible for a smaller percent of the emissions associated with electricity production.

e Cost per ton is based on the present value of all program costs (including initial incentives, program administration, and performance-based incentives) divided by the expected lifetime GHG emissions reductions.

Due to the popularity of the GJGNY residential financing program, $80 million in anticipated 2015 RGGI funds will be allocated to continue the program through March 31, 2016. Of this amount, approximately $32 million will be allotted towards residential energy efficiency, and approximately $48 million for residential solar loans.

The GJGNY Program will help to create jobs and assist in reducing the disproportionate cost burden and environmental impacts on low-income families and environmental justice communities.

With regard to workforce development, the GJGNY Program will help to better prepare New York State's workforce for jobs in the clean energy sector. The program, targeting individuals from disadvantaged communities, is designed to increase access to energy efficiency and renewable energy training and employment opportunities for those who might not otherwise be served.

GJGNY workforce development and training activities are expanding New York State's capacity to deliver training services through working with community-based training organizations, expanding existing training centers, providing much-needed training equipment and tools, and minimizing barriers to delivering field testing and certification examinations. The initiative is also providing direct-entry, on-the-job, and apprenticeship incentives to help defray the costs associated with bringing on new hires. Workforce development and training activities promote the widespread implementation of energy efficiency measures and provide meaningful employment opportunities for job seekers.

See the monthly and annual GJGNY reports for additional program metrics (http://www.nyserda.ny.gov/About/Green-Jobs-Green-New-York/GJGNY-Advisory-Council-Reports).

13 NY Green Bank

13.1 Program Description

Launched in 2014 as a new division of NYSERDA, NY Green Bank is a $1 billion State-sponsored specialty finance entity working in partnership with the private sector to increase investments into New York's clean energy markets. Through FY15-16 NY Green Bank has received $52.9 million in RGGI proceeds. Designed to address gaps and barriers in clean energy financing markets – and to transform those markets as part of the integrated statewide energy transition – NY Green Bank represents an innovative business model at the forefront of comparable institutions nationally and internationally.

NY Green Bank's mission is to accelerate clean energy deployment in New York State by working in partnership with the private sector to transform financing markets. NY Green Bank uses various commercial and market-based strategies to address financial market barriers and gaps that impede the flow of private capital for the clean-energy sector. NY Green Bank is market-focused and market responsive, operating in the wholesale (not retail) markets. In all of its investments, certain minimum criteria must be met including: generating expected financial returns on a portfolio basis so that NY Green Bank is self-sustaining; transactions contribute to financial market transformation; and critically, certain clean energy outcomes are expected. Specifically, clean energy outcomes include the potential for energy savings and/or clean energy generation – all contributing to GHG reductions in support of New York's clean energy policies.

RGGI proceeds allocated to NY Green Bank support the key RGGI goal of GHG emissions reduction through investment in qualifying renewable energy, energy efficiency and other clean energy technologies. NY Green Bank's focus is on proven technologies and scalable and replicable projects and investments, in the context of partnering and co-investing with private sector participants. NY Green Bank's commercial approach to proposal evaluation, addressing and pricing risk and structuring transactions to meet its investment criteria support outcomes for the investment of RGGI proceeds by NY Green Bank that align with RGGI's overall goals. NY Green Bank's ability to recycle its capital through numerous successive projects (as initial investments mature or are monetized), as well as mobilize and leverage private capital to invest alongside NY Green Bank mean that each dollar of RGGI proceeds deployed by NY Green Bank can be expected to have a greater impact.

13.2 Benefits

NY Green Bank is a cost-effective and complementary component of New York State's evolving portfolio of clean energy initiatives. It uses demonstrated financing tools to promote self-sustaining markets, while enabling private sector financing to expand the frontiers of current commercial clean energy investment opportunities, ultimately increasing the deployment of proven clean energy technologies in New York State. With a flexible, nimble, and dynamic approach, NY Green Bank is able to actively identify and alleviate existing market barriers and financing gaps, and allow market forces to reduce the need for government support. NY Green Bank's objectives are well-aligned with those of RGGI since NY Green Bank is specifically focused on accelerating the deployment of eligible and approved clean energy technologies and its minimum investment criteria include the potential for energy savings and/or clean energy generation involving GHG reduction benefits.

NY Green Bank partners with the private sector to address and alleviate barriers and gaps in current clean energy financing markets through a variety of approaches and transaction structures. Rather than compete with private sector clients and partners NY Green Bank looks to crowd them in to the marketplace, and its collaborative transactions are specifically aimed at transforming clean energy financing markets by enabling greater scale, new and expanded asset classes, and greater liquidity. The benefits of NY Green Bank activity come not just from the investment of its own funds, but from the ability to leverage private capital into the clean energy sector, materially increasing the capital mobilized, motivating faster and more extensive private participation in the clean energy marketplace, and advancing clean energy financing markets to create a more efficient, reliable, and sustainable energy system in the state.

Central to achievement of its objectives is NY Green Bank's ability to efficiently recycle funds. Unlike a pool of public funds that is dispensed once to qualifying projects as nonrefundable grants or subsidies, funds entrusted to NY Green Bank are disbursed under commercial arrangements generating investment income and requiring repayment in accordance with agreed terms for each product and client/partner project. This means that as each dollar from NY Green Bank cycles through successive investments, benefits generated will be compounding and not just attributable to funds advanced to a single clean energy project. Further, as the commercial markets expand into and increasingly accommodate clean energy finance needs previously supported by NY Green Bank, the multiplier effect on NY Green Bank's investments will continue, as NY Green Bank moves to the next "near-frontier" of clean energy market activity. All New Yorkers benefit from a thriving clean energy sector that grows the economy and improves the environment, while receiving greater returns and public benefits for every dollar spent on clean energy.

14 Program Evaluation and Reporting

The overarching goals of the RGGI program evaluation effort are to provide objective and credible information that supports optimum program operation and outcomes, and provides program accountability. The evaluation effort will assess progress toward meeting stated program and public policy goals, as well as progress in moving markets toward behaviors that result in emissions reductions and increased energy efficiency and use of renewable energy.

The evaluation and reporting activities outlined herein will be applied to the portfolio of RGGI programs described in this Plan. RGGI program evaluation and status reports will address the portfolio of programs, funding and benefits included in this Plan.

A separate evaluation operating plan has been developed for the Green Jobs - Green New York (GJGNY) Program.[18] Evaluation and reporting activities discussed within this section pertain to all other RGGI programs.

14.1 Evaluation Budget

The budget for RGGI program evaluation is based on the program evaluation budget established for NYSERDA's current SBC-funded energy-efficiency programs, which is limited to not more than five percent of total program funding. The evaluation budget will support: overall evaluation design and planning, implementation of plans by third-party contractors, and NYSERDA's management of the evaluation activities. Implementation of the evaluation plans will involve collection and analysis of primary and secondary data by independent contractors. Primary data collection activities that may be undertaken by evaluation contractors include: on-site verification; metering and monitoring of installed measures; and conducting in-person, telephone, email, and other types of surveys and interviews. NYSERDA will use its best efforts to leverage existing evaluation experience and staffing to maximize economies of scale.

[18] The GJGNY Evaluation Operating Plan can be found on NYSERDA's website at the following link: http://www.nyserda.ny.gov/~/media/Files/EERP/Green%20Jobs%20Green%20New%20York/gjgny-op-plan-for-program-eval.ashx?sc_database=web

14.2 Evaluation Approach

NYSERDA tailors evaluation to the specific types of RGGI programs and their approach to achieving CO_2e reductions. Individual programs will receive varying levels of evaluation depending on need. The focus of the evaluation work will be on assessing program impacts, namely CO_2e reductions. Process and market evaluations are also planned, especially for programs that are not already receiving process or market studies under another funding source such as the SBC. Each of these three main areas of program evaluation – impact, market and process - is described briefly in this section.

The types of programs presented in this Plan are expansive in terms of the sectors and fuels covered and the ways in which they reduce CO_2e. NYSERDA has divided programs into two broad categories for purposes of evaluation:

- Deployment (Market Development) Programs that provide direct emission reductions through on-site electric or fossil-fuel efficiency measures, or on-site generation that displaces grid electricity.
- Research and Development (Innovation) Programs that provide less direct, longer-term benefits in advancing information, technologies and markets.[19]

These two categories of programs present different evaluation needs, especially in the area of impact evaluation, as described in the following section.

14.2.1 Impact Evaluation

Impact evaluation measures the outcomes and co-benefits attributable to a program, calculates the cost-effectiveness of a program, and compares the outcomes to the goals set forth for the program. Key metrics for evaluating impacts of the RGGI programs include, but may not be limited to, the following direct outcomes and co-benefits: CO_2e reductions; electricity and fuel savings; customer bill savings; program cost per ton of CO_2e reduced; and job creation.

For Deployment (Market Development) Programs that provide direct emission reductions through on-site electric and fossil-fuel efficiency projects, NYSERDA first plans to measure and verify the electric and fossil-fuel savings attributable to the programs, and then apply emission factors to determine CO_2e reductions. Measurement, verification and attribution analysis will be conducted on a sample of

[19] Programs in this second category are: Clean Energy Business Development, Advanced Power Technology, Climate Research and Analysis, Transportation Research and Industrial Innovations.

completed projects according to industry best practices and will build on NYSERDA's experience with SBC Program evaluation. Similar approaches may be appropriate as well for on-site generation projects that are displacing electricity otherwise purchased from the grid. Once the evaluation of electric and fossil-fuel savings is complete, NYSERDA plans to apply default emission factors available from secondary sources. Default factors are commonly used in lieu of source testing due to the time and cost of such testing.[20] Evaluations will ensure that appropriate emission factors, taking into consideration the technology, timing, and location of projects, are applied to fossil-fuel savings.

Evaluation strategies for Research and Development (Innovation) Programs (i.e., those programs that do not provide emission reductions through on-site energy efficiency and generation projects) will be explored in detail by NYSERDA and contractors procured to provide assistance in this area. Specific evaluation plans will take into consideration the level of rigor necessary for the program-reported emission-reduction estimates to apply an appropriate level of rigor in the evaluations. For example, programs involving detailed and project specific technical studies of expected emission reductions may require less emphasis by evaluation than other programs.

NYSERDA recognizes the importance of providing information on the geographic distribution of program funding and benefits, and will examine how best to present this information within available technical capabilities. Impacts for specific populations, such as low-income and environmental justice communities, will be examined for programs expected to address such populations. Additionally, some co-benefits such as job creation will be addressed at the portfolio level in the evaluation.

Impact evaluations underway or planned for the current cycle include, but are not limited to, the following. As the RGGI portfolio evolves, evaluation plans will as well.

- Multifamily Carbon Emission Reduction Program: measurement and verification of the fuel use and emission impacts attributable to the program.
- Home Performance with ENERGY STAR® Program: assessment of energy and emission impacts from Green Jobs-Green NY "audit only" participants who may have installed measures on their own in the absence of incentives; measurement and verification of impacts attributable to RGGI fuel incentives.[21]

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[20] US Environmental Protection Agency. 2007. National Action Plan for Energy Efficiency. *Model Energy Efficiency Program Impact Evaluation Guide.* Prepared by Steven R. Schiller, Schiller Consulting, Inc. (www.epa.gov and eeactionplan), Chapter 6.

[21] Ibid

- Municipal Water and Wastewater Program: measurement and verification of energy savings and emission impacts attributable to the program.
- GJGNY Small Commercial Program: Examine measure adoption rate and estimate energy impacts from completed audits.

14.2.2 Process Evaluation and Market Characterization/Assessment

Process evaluation reviews oversight and operations, gauges customer satisfaction and recommends process, and efficiency improvements. Formative process evaluations, conducted early in the program development, can offer actionable recommendations to help improve program efficiency and effectiveness and optimize the desired program outcomes.

Market characterization and assessment (MCA) develops an understanding of markets and market actors; provides information to support program design and delivery; and tracks changes in markets over time. This area of evaluation provides "market intelligence" to help target programs to best achieve their goals.

Though not every program may receive evaluation, both process and market evaluation will be performed on all types of programs within the RGGI portfolio. Process and market evaluations underway or planned for the current cycle include, but are not limited to, the following. As the RGGI portfolio evolves, evaluation plans will as well.

- Home Performance with Energy Star Program: assess program experience, identify program improvements, characterize and assess the market for supported technologies and services. Includes RGGI fuel efficiency incentive recipients and GJGNY audit/loan participants.[22]
- Clean Energy Business Development: A market evaluation of the clean energy industry is under consideration
- Community Solar NY: A logic model is currently under development for this program. NYSERDA may also conduct a study on solar soft costs
- Economic Development Growth Extension (EDGE): A process evaluation is underway for this program to inform future community based program strategies
- Power Systems Program: Future evaluation plans are under consideration at this time.

[22] Ibid

- Transportation Research: Due to the NYSERDA Transportation Program supporting a wide range of technologies and strategies, a modified MCA will be implemented that defines the market as a set (network) of organizations and companies working on, using, or potentially able to use technologies or initiatives that the program has supported. The MCA will collect information on this set of market actors through a survey of these organizations to gather information about transportation-related goals and initiatives, barriers to achieving those goals, relationships with other organizations, and market characteristics.

14.2.3 Baseline Studies

Within the evaluation, NYSERDA recently conducted a Residential Statewide Baseline Study and a Commercial Baseline Study is underway. These baseline studies are designed to assess Residential and Commercial markets across a broad range of customer segments and energy measures. The goals of these studies are: 1) to better understand building stock and associated energy use, including saturations of energy-consuming measures, penetrations of energy-efficient equipment, building characteristics and energy management practices; and 2) use this information to estimate the technical, economic and achievable energy efficiency opportunities in New York in the next three and five years. Though these large studies are being supported by SBC funding, RGGI funds are supplementing the budget to allow for robust data collection on fuel measures.

14.2.4 Use of Evaluation Results

The evaluation and program implementation activities described in this Plan will be integrated with the ultimate goal of “real time” feedback from the evaluation effort being used to help inform and improve programs. Early evaluation results will be used to help identify possible issues with program performance, and provide recommendations to NYSERDA as to how those issues might be rectified. Reports will be made publicly available so interested parties can review any programmatic recommendations that are made. NYSERDA will use evaluation data and information to make programmatic changes in the annual Plan updates, or as needed.

14.3 Evaluation Implementation

14.3.1 Staff and Contractor Resources

Evaluation of New York's RGGI programs will be managed by NYSERDA's Performance and Market Standards (P&MS) group. PMES is organizationally separate from NYSERDA groups that administer programs. PMES staff has been responsible for managing evaluation of NYSERDA's major energy efficiency, electric demand reduction, renewable energy, and research and development programs for nearly 15 years. The staff and knowledge base within P&MS will be leveraged to provide effective, efficient evaluation management of the RGGI programs. Stakeholder input will be sought to inform evaluation of the RGGI programs.

For the subset of programs operating in the deployment space, NYSERDA has procured the services of two main evaluation contractor teams. One provides impact evaluation services and the other provides process evaluation and market characterization/assessment for the RGGI programs. A third main evaluation contractor team has been procured to conduct impact, process and market evaluation for RGGI programs that focus more on research and technology development and demonstration.[23] NYSERDA elected to parse out these program activities under a separate evaluation contractor due to nature of their approach and expected outcomes.

NYSERDA also works with three other evaluation contractors, currently under contract, who provide overarching/support services.

- General Evaluation Assistance -- assists NYSERDA staff to plan, coordinate and maximize the usefulness of all of the evaluation activities.
- Survey Research -- administers large scale survey research and provides input on sampling and survey methodology to support evaluation studies.
- Economic/Environmental Evaluation -- specializes in economic and environmental analyses. Tasks performed in support of the RGGI program may include: researching and recommending protocols for evaluating GHG emission reduction programs across sectors, recommending specific GHG emissions factors and alternatives, and exploring methods for valuing GHG emissions reductions.

[23] This evaluation contractor will also provide evaluation services for NYSERDA's SBC funded Technology & Market Development Program.

Final design and implementation of program-specific evaluation efforts will be undertaken by one or more of NYSERDA's third-party evaluation contractors, in conjunction with P&MS staff.

The RGGI evaluation will be closely coordinated with NYSERDA's existing evaluation efforts for SBC and other programs. This coordination will be especially important on programs that receive SBC and RGGI funding to ensure that the evaluation does not become overly burdensome for participants and issues associated with survey respondent fatigue are minimized. Such coordination will also aid in achieving greater efficiency and cost-effectiveness of the evaluation overall.

NYSERDA is evolving its evaluation framework and approach under the Clean Energy Fund. These changes and improvements will apply to RGGI evaluation as they are phased in. For a more detailed explanation of the proposed changes, see NYSERDA's Clean Energy Fund Information Supplemental.[24]

14.4 Reporting

NYSERDA will prepare an annual RGGI program evaluation and status report using progress tracking, findings and inputs from the independent evaluation contractors. The annual report will include for each prior year: an accounting of all sales of CO_2 allowances and the funds generated, a summary description of program activities, a quantification of benefits, and an accounting of the administration costs and expenditures. The annual report will also provide information on the geographic distribution of program funding across the State.

Quarterly, NYSERDA will prepare a RGGI program status report updating progress made in each major program area. The reports will include an estimate of benefits, and an accounting of the costs and expenditures.

Metrics and targets presented in this document (e.g., dollars per ton) were established for early comparison purposes to facilitate program selection. They are subject to modification in the event that changes are made to the discounting rate, discounting approach, evaluation methods, emissions factors and budget levels. Previous RGGI Operating plans assumed each Program's longest-lived measure life as an input for the expected lifetime benefit calculations. Beginning with the 2013 RGGI Operating Plan,

[24] NYSERDA's Clean Energy Fund Information Supplemental was submitted on June 25, 2015 and is available at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={FC3FBD53-FBAC-41FB-A40E-3DA0A5E0866A}.

each Program's savings-weighted average end of useful measure-life was used as an input for the expected lifetime benefit calculations. Using the savings-weighted average end of useful measure-life provides a more realistic lifecycle for the persistence of energy, bill and emission savings. Furthermore, at the time of development of this Plan, the extent to which program participants will leverage complementary RGGI program support as well as other non-RGGI program support is unknown. Quarterly status reports will quantify and report all such cross-program overlap, and the reported actual benefits and outcomes of the RGGI programs in this Operating Plan will be inclusive of such quantified cross-program overlap.

15 Administration

15.1 Guiding Principles

The members of NYSERDA's Board of Directors, management, and staff are committed to carrying out their responsibilities with accountability and transparency through efficient, effective operations.

NYSERDA uses an open, stakeholder-based planning process in developing, operating, and evaluating its programs. The involvement between NYSERDA's technically diverse, knowledgeable staff and external stakeholders in program planning, project selection, and program evaluation results in more effective program administration and provides for increased transparency and effectiveness. NYSERDA places emphasis on independent, objective analysis, and the free exchange of ideas and information in an effort to produce the best programs and policies. Management also promotes and encourages honest and ethical behavior within the work place to fulfill its responsibility of ensuring proper stewardship of public resources. Programs are adapted to changing needs and carried out in a responsive manner, while maintaining sound fiscal and managerial controls. Lastly, NYSERDA strives to achieve efficient and effective operations, using relatively modest staffing levels.

15.2 Procurement Policies and Procedures

In administering all of its programs, including programs proposed in the Plan, contracts are procured in accordance with NYSERDA's *Procurement Contract Guidelines* (Guidelines), approved annually by NYSERDA's Board of Directors pursuant to Public Authorities Law Section 2879. The Guidelines generally require NYSERDA to use its best efforts to secure offers from potential contractors on a competitive basis and requires advance notice of pending solicitations to be published in the *State Contract Reporter.* The Guidelines permit waiver of the competitive solicitation requirements for work that is expected to cost $50,000 or less; unsolicited proposals, single source and sole source vendors; and other designated reasons.

Selection of contracts is accomplished in an extremely transparent manner. Proposals submitted in response to solicitations are reviewed and evaluated in accordance with the criteria noted in the solicitation by a Technical Evaluation Panel (TEP), comprised of NYSERDA staff and outside reviewers with relevant expertise. A number of NYSERDA programs also provide incentives to any qualified program participant who meets pre-defined program terms and conditions.

15.3 Financial Tracking Systems

NYSERDA will provide an efficient and accurate accounting of all program expenditures and administrative costs using its well-established system of internal controls and a variety of system procedures. The programs are subjected to annual audit by independent auditors appointed by the NYSERDA Board. In addition:

- NYSERDA's accounts are under the control of their statutory fiscal agent, the Commissioner of the Department of Taxation and Finance. Funds for the RGGI-funded activities are segregated from other sources to facilitate an accurate accounting of all receipts, interest earnings, and disbursements.
- Pursuant to NYSERDA's by-laws, contracts and agreements exceeding $25,000 may only be signed by one of NYSERDA's officers. This centralized authorization function provides for effective segregation of financial and contracting duties and facilitates effective accountability.
- All payment requests receive a multi-disciplinary review prior to payment.

NYSERDA uses an automated system that facilitates an accurate and timely accounting of all program expenditures. The automated accounting system also produces various monthly financial reports that are distributed to NYSERDA management and program staff for review. In addition, this information is used to prepare evaluation and financial status reports as required by the evaluation plan.

15.4 Administration Budget

Included in Program Administration are direct salaries and benefits for program staff, as well as a proportionate allocation of salaries and benefits for support staff (e.g., contracts, finance, information technology, legal, and marketing and outreach), facilities and equipment costs, travel, supplies, etc. Fixed costs are applied proportionally across all funding sources, using program staff salary costs as a percentage of total salary costs, and therefore reflect economies of scale. These estimates are based on historical experience with the SBC-funded programs, and consider administrative efficiencies.

Appendix A

This appendix describes the general methods and assumptions that are used to calculate the energy savings, emission reductions, bill savings and cost-effectiveness metrics presented in the Operating Plan (Plan) for Investments in New York under the CO_2 Budget Trading Program and the CO_2 Allowance Auction Program.

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_2e Reductions

Emissions factors are used to translate the energy savings data into annual GHG emissions reduction values. The GHGs evaluated in the Plan include carbon dioxide, methane, and nitrous oxide. Because each of these gases has a different global warming potential,[25] emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO_2e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,[26] 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 (IPCC) Fourth Assessment Report: Climate Change 2007.

Gas	Global Warming Potential
Carbon dioxide (CO_2)	1
Methane (CH_4)	25
Nitrous oxide (N_2O)	298

25 A global warming potential is a measure that estimates how much a given mass of a GHG contributes to global warming. It is calculated over specific time intervals as gases vary in lifespan and radiative efficiency, e.g., 100 years. The IPCC also provides 20 and 500-year GWP values.

26 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.

Table A-2 shows the emission factors used in the Plan to calculate emissions from on-site fuel combustion, which are derived from U.S. Environmental Protection Agency (EPA) emission coefficients. The CO_2e values represent aggregate CO_2, CH_4 and N_2O emissions. If a program in the Plan covers more than one sector (e.g., the Commercial and Industrial Program), then the estimated reduction is based on a straight average emission factor.

Table A-2. Fuel Combustion Emission Factors by Sector

Sources: U.S. EPA State Climate Energy Program's State Inventory Tool (SIT) Modules, February 2013 release. City of New York, Inventory of New York City Greenhouse Gas Emissions, November 2014, by Cathy Pasion, Mikael Amar and Michael Delaney. Mayor's Office of Long-Term Planning and Sustainability, New York, 2014.

	Transport (lb CO_2e/MMBtu)	Residential (lb CO_2e/MMBtu)	Commercial (lb CO_2e/MMBtu)	Industrial (lb CO_2e/MMBtu)
Coal	N/A	224.8	211.4	203.7
Natural Gas	117.4	117.4	117.4	114.7
#2 Oil/Distillate/ Diesel	163.0	163.8	163.8	162.2
#6 Oil/Residual	N/A	N/A	166.3	166.0
Kerosene	N/A	162.1	162.1	161.8
Propane	136.1	136.9	136.9	136.9
Gasoline	155.0	N/A	N/A	N/A
Aviation Fuel	159.3	N/A	N/A	N/A
Wood	N/A	15.8	15.8	3.9
Steam	N/A	132.2	132.2	N/A

An average emission factor of 625 lb CO_2e/MWh is used to estimate emission reductions associated with electricity use reductions for all sectors. This value includes emissions from in-state electricity generation as well as emissions associated with net-imports of electricity.[27] While electricity savings may not lead to near-term emission reductions under the RGGI CO_2 cap, savings will potentially reduce imports of electricity to New York; the demand for CO_2 allowances, leading to a possible future reduction in the cap; and the carbon-footprint of end-users, as they will be responsible for a smaller percent of the emissions associated with electricity production.

[27] The emission factor for electricity is based on data from *Patterns & Trends- New York State Energy Profiles: 1997 – 2011* (NYSERDA 2013) and methodology from the GHG Inventory and Forecast prepared for the 2015 New York State Energy Plan.

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; basic service charges have been excluded.

Table A-3. Fuel Prices by Sector[28]

Sector	Electricity ($/kWh)	Natural Gas ($/MMBtu)	Fuel Oil / Distillate ($/MMBtu)	Propane ($/MMBtu)
Residential	0.18	8.57	25.59	34.21
Commercial	0.16	5.09	24.51	26.04
Industrial	0.12	5.09	23.39	30.32
Transportation	0.05	N/A	27.58	N/A
C&I	0.14	5.09	23.95	28.18

Sector	Residual ($/MMBTU)	Kerosene ($/MMBTU)	Wood ($/Cord)	Coal ($/Ton)
Residential	N/A	28.13	7.83	N/A
Commercial	17.41	28.13	N/A	5.78
Industrial	17.41	24.56	N/A	4.74
Transportation	N/A	N/A	N/A	N/A
C&I	17.41	26.35	N/A	5.26

[28] 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 2011 retail prices as reported in NYSERDA's *Patterns and Trends- New York State Energy Profiles: 1997-2011*

A.4 Program Measure Life

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

Table A-4. Program Measure Life Assumptions

Program	Electricity Measure Life	Fuels Measure Life
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
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

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

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

New York State Energy Research and Development Authority

17 Columbia Circle
Albany, NY 12203-6399

toll free: 866-NYSERDA
local: 518-862-1090
fax: 518-862-1091

info@nyserda.ny.gov
nyserda.ny.gov

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