New York State Energy Research and Development Authority

# Operating Plan for Investments in New York Under the $CO_2$ Budget Trading Program and the $CO_2$ Allowance Auction Program

November 15, 2012

nyserda
Energy. Innovation. Solutions.

# NYSERDA's Promise to New Yorkers:

New Yorkers can count on NYSERDA for objective, reliable, energy-related solutions delivered by accessible, dedicated professionals.

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

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

**Our Core Values:** Objectivity, integrity, public service, and innovation.

## Our Portfolios

NYSERDA programs are organized into five portfolios, each representing a complementary group of offerings with common areas of energy-related focus and objectives.

### Energy Efficiency & Renewable Programs

Helping New York to achieve its aggressive clean energy goals – including programs for consumers (commercial, municipal, institutional, industrial, residential, and transportation), renewable power suppliers, and programs designed to support market transformation.

### Energy Technology Innovation & Business Development

Helping to stimulate a vibrant innovation ecosystem and a clean energy economy in New York – including programs to support product research, development, and demonstrations, clean-energy business development, and the knowledge-based community at the Saratoga Technology + Energy Park®.

### Energy Education and Workforce Development

Helping to build a generation of New Yorkers ready to lead and work in a clean energy economy – including consumer behavior, youth education, and workforce development and training programs for existing and emerging technologies.

### Energy and the Environment

Helping to assess and mitigate the environmental impacts of energy production and use – including environmental research and development, regional initiatives to improve environmental sustainability, and West Valley Site Management.

### Energy Data, Planning and Policy

Helping to ensure that policy-makers and consumers have objective and reliable information to make informed energy decisions – including State Energy Planning, policy analysis to support the Regional Greenhouse Gas Initiative, and other energy initiatives; and a range of energy data reporting including *Patterns and Trends*.

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# Executive Summary

New York has an opportunity to create and implement a comprehensive approach to mitigate emissions of carbon dioxide ($CO_2$) and other Greenhouse Gases (GHG) through programs and initiatives funded through the sale of Regional Greenhouse Gas Initiative (RGGI) $CO_2$ allowances. Additionally, proceeds from RGGI sales can be used to augment existing policies and programs to advance strategic needs in New York, including the transition to a Clean Energy Economy. This Operating Plan (Plan) was structured to help launch a sustainable, carbon mitigation plan while meeting the near-term needs of a healthy economy, and includes activities to help attain New York's Climate Change goal. The Plan is also designed to help build the necessary capabilities required for an economy to thrive by incorporating climate mitigation strategies, regional sustainability planning initiatives, and creating and promoting advanced energy technologies.

Building from the January 2012 version, this Plan incorporates feedback received during an open public meeting of the Advisory Group[1] and subsequent written comments from stakeholders. Overall, the Plan covers a three-year planning horizon[2] and articulates how approximately $168.2 million dollars of $CO_2$ auction proceeds will be invested among 11 unique programs. A summary of the benefits from previous RGGI investments can be found in the New York State Energy Research and Development Authority's (NYSERDA) quarterly progress reports online: http://www.nyserda.ny.gov/en/Program-Planning/Regional-Greenhouse-Gas-Initiative/Evaluation-of-RGGI-Funds.aspx

The investments in Operating Plans seek to advance the State's broad energy goal of moving toward a clean energy economy by providing reductions in GHGs in the near term and positioning New York to make additional reductions in GHGs over the longer term.

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

- The program is cost-effective and maximizes the quantity of carbon equivalents reduced per program dollar invested.
- The technology and investment has long-range potential to reduce GHG emissions in New York.
- The program has the potential to reduce the cost of achieving the emission reduction goals of the $CO_2$ Budget Trading Program.
- The program provides other benefits for New York such as, create jobs, leverage capital investment to promote economic development, provide health and environmental benefits, and enhance municipal capacity to further reduce GHG emissions.
- The initiative can help reduce the disproportionate cost burden and harmful environmental impacts on low-income families and environmental justice communities.

[1]The Advisory Group consists of stakeholders representing 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.
[2]The Plan covers NYSERDA's fiscal years 2012-13, 2013-14 and 2014-15. Each fiscal year commences on April 1.

- The program addresses the relative need for these funds based upon availability of other funding sources for the targeted activities.

These criteria served as guidance for the development of the overall portfolio of programs. They are not weighted; rather the intention is to achieve a strong balance of programs. Additionally, the minimum or "critical mass" funding level needed to run an effective program was 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.

During the three-year planning horizon for this Plan, auction proceeds are estimated to total $200.8 million; $168.2 million of these funds are to be made available for programs, the balance is used for program administration, evaluation, and other non-programmatic costs. Additionally, this Plan allocates $140.3 in funding from prior collections that have not yet been committed under contract to specific projects. See the Overview of Program Funding section for more details.

The selected programs build upon NYSERDA's existing electric-focused programs i.e., System Benefits Charge (SBC), Energy Efficiency Portfolio Standard (EEPS), and Renewable Portfolio Standard (RPS). The programs are designed to demonstrate how RGGI funds can fill program gaps in all sectors and address all fuels by integrating various funding resources to capture additional efficiencies and GHG reductions and energy bill savings opportunities not currently available to New Yorkers and New York businesses.

## Highlights of Benefits

In general, the RGGI portfolio of programs will:

- Provide substantial consumer benefits through a range of energy efficiency and renewable initiatives.
- Stimulate a clean energy economy and economic competitiveness through support of clean energy industrial development, workforce development, and the development of regional priority initiatives to reduce GHGs and grow businesses in New York.
- Build capacity for action, partnering with municipalities, schools, communities, institutions, and businesses through a variety of programs.
- Plan for climate change through regional sustainability planning and grants, and climate change adaptation and mitigation research.
- Employ an innovative power sector GHG reduction pilot to identify the most cost-effective, market-ready mitigation options for New York. Reduce and avoid GHG and co-pollutant emissions, demonstrate New York's commitment to its environmental goals, and support a national, multi-sector GHG reduction program.

An overview of the quantifiable benefits that are expected to be achieved through this three-year portfolio is presented below.[3]

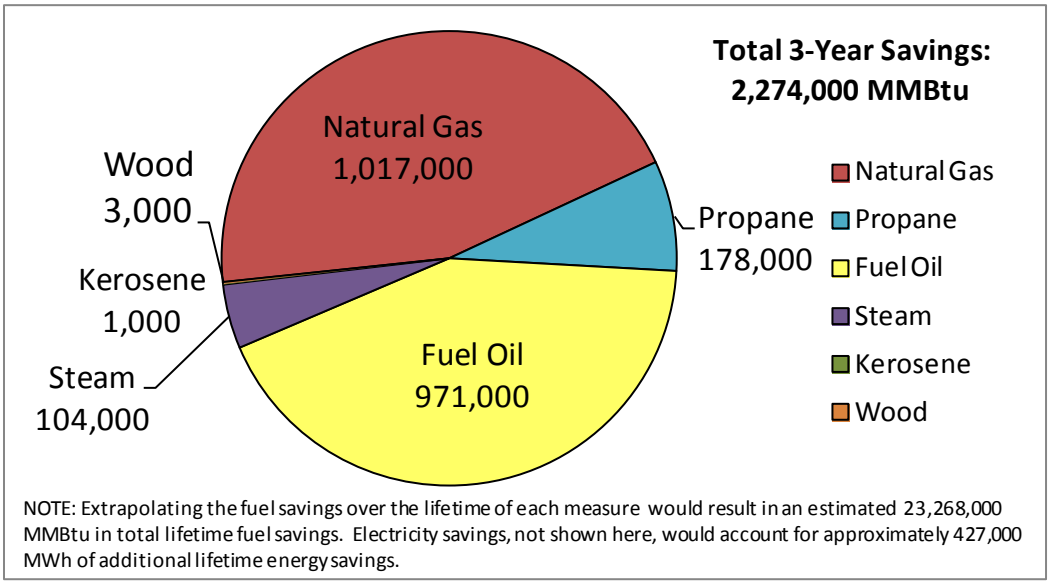
[3] Due to the nature of some projects, there can be lag time between initial investment in projects and realization of the associated savings. The values represented here may not be realized in the same year in which the funds are expended. Nevertheless, NYSERDA anticipates that the ratio of savings to dollars reflects the benefits which are likely to accrue as a result of projects funded through this program.

**Energy Savings**
The estimated fuel savings related to the four program areas that are expected to realize savings during the three-year Plan timeframe is 2,274,000 MMBtu across all fuels. These savings are broken down by fuel type in Figure ES-1. Extrapolating the savings over the lifetime of each measure would result in an estimated 23,268,000 MMBtu in total lifetime fuel savings.

Electricity savings would account for approximately 427,000 megawatt-hours (MWh) of additional lifetime savings. Estimated savings related to the Cleaner Greener Communities program, Regional Economic Development and Greenhouse Gas Reduction program, the Competitive Greenhouse Gas Reduction Pilot and other research and development (R&D) initiatives are not included due to the uncertainty of project activities and associated savings.

For some programs specific GHG benefits are very difficult to quantify, while for others, actual estimates for GHG savings are difficult to project at this time, and anticipated benefits are varied in sector and scope. These types of programs include research and development projects, and certain regional planning initiatives respectively. Nevertheless, some benefits can be anticipated from these program areas including long and short term job creation, economic development benefits, efficiency improvements, increased use of renewable energy, pollution prevention, abatement of fuel use, annual electric savings, and associated emissions reductions.

**Figure ES-1. Three-Year Energy Savings by Fuel Type (MMBtu)**



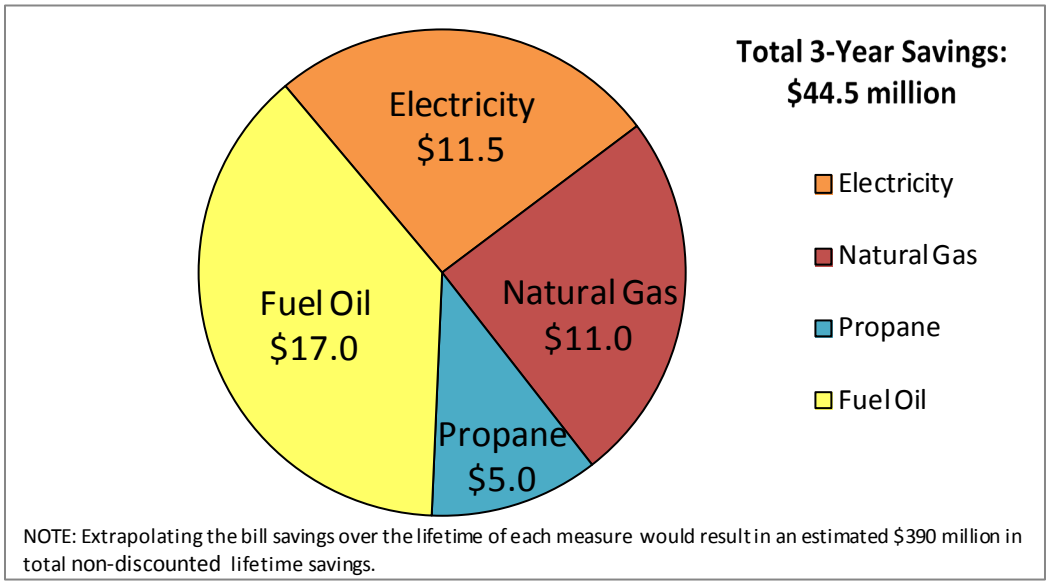

NOTE: Extrapolating the fuel savings over the lifetime of each measure would result in an estimated 23,268,000 MMBtu in total lifetime fuel savings. Electricity savings, not shown here, would account for approximately 427,000 MWh of additional lifetime energy savings.

**Energy Bill Savings**
The estimated bill savings related to the four program areas[4] that are expected during the three-year Operating Plan timeframe is $44.5 million[5]. These four programs comprise approximately 46

[4] The four program areas are Green Jobs- Green New York, Residential Efficiency Services, Municipal Water/Wastewater, and Industrial Process Improvement.
[5] This total excludes bill savings associated with steam for the Multifamily Performance and the Green Jobs-Green New York Multifamily Residential Programs and bill savings associated with wood for the Green Jobs- Green New York Single Family Residential Program.

percent of the three-year RGGI budget outlined in this Plan.[6] See Overview of Program Funding section for more details of this breakdown. The savings are broken down by fuel type in Figure ES-2. Extrapolating the savings over the lifetime of each measure will result in an estimated $390 million in total non-discounted lifetime savings. Estimated savings related to the Cleaner Greener Communities program, Regional Economic Development and Greenhouse Gas Reduction program and the Competitive Greenhouse Gas Reduction Pilot and other R&D initiatives are not included due to the uncertainty of project activities, which will be determined through a competitive process and associated savings.

**Figure ES-2. Three-Year Bill Savings by Fuel Type ($Million)[7]**




**Emissions Reductions**

The four program areas that are expected to realize savings during the three-year Plan timeframe would reduce $CO_2$ emissions by approximately 213,000 tons, which is equivalent to taking approximately 19,000 vehicles off the road.[8] This portfolio of programs will save approximately 6.7 million gallons of fuel oil, which translates to a lifetime value of approximately 2.3 million barrels of crude oil displaced.[9] Extrapolating these results, the emissions reductions over the lifetime of the measures and practices would total approximately 176,000 tons of $CO_2$ from electricity savings and 1.7 million tons of $CO_2$ from fuel savings. If the Competitive Greenhouse Gas Reduction Pilot provides emissions reductions that cost $18 per ton of $CO_2$ and achieves mostly fossil-fuel savings, the lifetime reductions from fuel savings associated with the overall portfolio of programs would be approximately 2.5 million tons of $CO_2$.

[6] The total $308.5 million is equal to the anticipated, calculated budgets, plus previously uncommitted funds, as presented in Table 3.
[7] Total three-year savings has been rounded to the nearest half million.
[8] 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. Nevertheless, electric efficiency projects will reduce the end-users' carbon-footprint since they will be responsible for a smaller percent of the emissions associated with electricity production.
[9] This estimate does not account for the full lifecycle costs for producing and distributing crude oil and petroleum products.

**Job Creation**

NYSERDA has preliminary estimates for potential job creation associated with RGGI funded programs. These estimates are based upon historical data and modeling for deployment, technology development and business development programs. In some cases, historical data is limited and program investment strategies are different. However, this information is used as a preliminary estimate until actual job impacts are examined as part of the RGGI evaluation activities. Table ES-1 shows how different job multiplier estimates are applied to the three-year budgets reflected in this Plan.

**Table ES-1. Job Creation Estimates for Three-Year Operating Plan Budgets[10]**

| Program Category | Program Name | Three-year Budgets ($ millions) | Three-year Budgets with Admin & Eval. ($ millions) [11] | Estimated Job Creation Multiplier | Estimated Sustained Jobs Created or Retained |
|---|---|---|---|---|---|
| Energy Efficiency & Other Deployment | Green Jobs-Green NY | 253.1 | 286.0 | 3 | 858 |
| | Residential Energy Services | | | | |
| | Municipal Water/Wastewater | | | | |
| | Cleaner, Greener, Communities | | | | |
| | Competitive GHG Reduction Pilot | | | | |
| | Regional GHG Reduction Program | | | | |
| Technology & Business Develop. | Advanced Transportation Development | 48.4 | 54.7 | 7.2 | 394 |
| | Industrial Process Improvement | | | | |
| | Clean Technology Industrial Development | | | | |
| | Advanced Power Technology | | | | |
| Research | Climate Research and Analysis | 7.0 | 7.9 | N/A | N/A |
| | Total | $ 308.5 | $ 348.6 | N/A | 1,252 |

[10] The Energy Efficiency & Other Deployment programs multiplier is based upon macroeconomic evaluation of the Energy Smart℠ 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.

[11] This value represents the sum of Funds Available for Program Implementation for the 3-year planning period plus Program Administration (eight percent); and Program Evaluation (five percent)during the three-year planning horizon.

# Introduction

## Background

Through the Regional Greenhouse Gas Initiative (RGGI), New York and its partner states pioneered the nation's first market-based, mandatory cap-and-trade program. Just as the RGGI program is serving as a national model for mandatory Greenhouse Gas (GHG) cap and trade regulations, New York is also creating a national model through its RGGI Operating Plan (Plan) to demonstrate how wise investment of auction proceeds can both stimulate the economy and reduce GHGs.

New York has an opportunity to create and implement a comprehensive approach to GHG through the sale of RGGI $CO_2$ allowances. Proceeds from RGGI sales can be used to simultaneously augment existing policies and programs to advance strategic needs in New York, including the transition to a Clean Energy Economy. The Plan was structured to help launch a sustainable, continuing carbon mitigation plan while meeting the short-term needs of a healthy economy, and includes activities to help attain New York's Climate Change goal. The Plan is also designed to help build the capabilities required for an economy to thrive by incorporating climate mitigation strategies and creating and promoting advanced energy technologies necessary to advance those strategies.

Building from the January 2012 version, this Plan incorporates feedback received during an open public meeting of the Advisory Group [12] and subsequent written comments from stakeholders. Overall, the Operating Plan covers a three-year planning horizon. [13] The plan articulates how funds collected prior to the planning horizon have been allocated to programs, but it focuses primarily on how anticipated future proceeds will be allocated among existing program budgets during the next three fiscal years.

RGGI auction proceeds will not be used to supplant existing programs or program goals, 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. Rather, these RGGI-funded programs are designed to augment and create synergies with existing efficiency and clean energy programs, and to encourage a redefinition of program goals in the context of a more comprehensive climate change strategy. The goals of increased energy efficiency, increased renewable energy generation, reduced criteria pollution, and low-income weatherization will be enhanced by these complementary resources. The investments are intended to advance the State's broad energy goal of moving toward a clean energy economy by providing reductions in GHGs in the near term and by positioning New York to make additional long term reductions.

The Plan is not intended to represent the totality of program activities and funding requirements that may be necessary to achieve ultimate carbon mitigation goals. Rather, the Plan should be considered in light of the many policies and programs designed to provide energy services to New Yorkers and help them achieve programmatic goals while simultaneously reducing carbon

[12] The Advisory Group consists of stakeholders representing 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.
[13] Covers NYSERDA's fiscal years 2012-13, 2013-14 and 2014-15. Each fiscal year commences on April 1.

emissions. The Plan has been designed to fill program gaps resulting from unmet funding needs, identify existing opportunities that have not received adequate resources, and to target emerging opportunities that will feed the next generation of energy technologies needed to meet statewide targets.

Despite the overall level of total funding across all government programs, incentive programs alone will not achieve deep emissions reductions over the long term. Deep emissions reductions will require systemic changes in government operations, buildings and infrastructure and the energy consumption patterns of businesses and individuals. Systemic changes will result only from educational campaigns and the capability of governmental resources to provide information and a sound policy framework to achieve energy efficiency and emissions reduction goals. Building the capability within private markets for energy services and continuing the development of energy technologies is necessary so that market responses and customer choices can incorporate climate mitigation concerns. To add formal structure to the emerging development of governmental and market-based climate mitigation capabilities, the Plan targets support for "capacity building" and recognizes that research and analysis must continue to ensure that evolutionary change toward a reduced-carbon economy is pursued.

## 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.[14] Under RGGI, the participating states have designed cap-and-trade programs that cap $CO_2$ emissions from power plants through 2015 and then lower the cap by ten percent by 2018.

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, and 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 was created to be consistent with the regulatory requirements previously mentioned.

In January 2012, the RGGI states began a 2012 Program Review as called for in the Model Rule.[15] The Program Review seeks to be a comprehensive evaluation to include program success, program

[14] The RGGI-participating states are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island and Vermont. New Jersey has announced its intent to withdraw from RGGI and is not offering allowances or requiring compliance past the first control period.

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

impacts, additional reductions, imports and emissions leakage, and offsets. Future Operating Plans will be designed to be consistent with any new regulatory requirements resulting from the 2012 Program Review.

## Program Goals

The goal of investing auction proceeds is to reduce both GHG emissions in New York and the cost of compliance with the $CO_2$ Budget Trading Program. Investments will be focused on GHG reduction opportunities related to energy production and use for all fuels across numerous energy consuming sectors. Investments will seek to advance the State's broad energy goal of moving toward a clean energy economy by providing reductions of GHGs in the near-term and positioning New York to make additional reductions of GHGs over the longer term.

Funds will 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.

## Program Focus and Geographic Scope

RGGI-funded activities will fill gaps ineligible for funding from other sources. For instance, RGGI program funding will be used to complement current investments in the **New York Energy $mart℠** program, which is part of New York's SBC programs, the RPS, and the EEPS and other agency programs that support the goals of the $CO_2$ Budget Trading Program.

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.

## Portfolio Development Criteria

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

Cost-effectiveness measured by quantity of carbon equivalents 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 emissions reduction goals of the $CO_2$ Budget Trading Program.
Other benefits for New York such as, create jobs, leverage capital investment to promote economic development, provide health and environmental benefits, and enhance municipal capacity to further reduce GHG emissions.
Opportunities to reduce the disproportionate cost burden and environmental impacts on low income families and environmental justice communities.
Need for funds based upon availability from other funding sources.

These criteria served as guidance for the development of the overall portfolio of programs. They are not weighted; rather the intention is to 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. Nevertheless, agricultural methane projects that receive $CO_2$ Emissions Offset credits under the $CO_2$ Budget Trading Program may also receive public benefits funds under a program covered in the Plan. All entities, including compliance entities, may pursue projects under any of the proposed programs in the Plan.

## Program Metrics

A number of program metrics are shown throughout this Plan. The $CO_2e$ reductions shown throughout this document include $CO_2$ reductions plus the co-benefits of other GHG reductions. In addition, a Technical Appendix has been included to explain the methodologies used to calculate various metrics appearing in the Plan.

Metrics and targets presented in this document (e.g., dollars per ton) were established for early comparison purposes to facilitate program selection and are subject to modification in the event that changes are made to the discounting rate, discounting approach, evaluation methods, or emissions factors.

A summary of the benefits from previous RGGI investments can be found online in NYSERDA's quarterly progress reports:
http://www.nyserda.ny.gov/en/Program-Planning/Regional-Greenhouse-Gas-Initiative/Evaluation-of-RGGI-Funds.aspx

# Overview of Program Funding

## Auction Proceeds Assumptions for Operating Plan

This section provides an explanation of the funding availability assumptions that were used to prepare the Plan. The intention of using conservative assumptions is to avoid overestimating the level of funds available.

First, the Plan assumes that the RGGI marketplace buys exactly the number of allowances that are necessary to cover $CO_2$ emissions during each compliance period. The "actual emissions" value of 376.8 million tons for the first compliance period was provided by RGGI, Inc., while the emissions estimates for subsequent timeframes came from the February 2012 RGGI Program Review "reference case" modeling results.[16] The modeling output for 2012-2014 was 344.2 million tons of $CO_2$ emissions. Altogether, this results in an estimate of 721 million tons of $CO_2$ emissions during the first two compliance periods.

Information about the overall number of allowances already circulating in the marketplace was obtained from RGGI, Inc. Approximately 432.8 million allowances have been sold at auction through March 2012, and about 27.5 million have been distributed through other methods (e.g., direct allocation) for a total of 460.3 million allowances. Therefore, under the assumptions, market participants would still need to acquire 260.7 million allowances by the end of the second compliance period, December 31, 2014.

RGGI, Inc. estimates that 15.7 million allowances will be distributed to the market through direct allocation during the second compliance period. As a result, it is estimated that 245 million current compliance period allowances would still need to be purchased at auction. Proceeds collected at the regional auction are distributed on a pro-rata share to participating states, and New York typically supplies approximately 38.93 percent of the allowances sold during each quarterly auction. At a market clearing price of $1.93/allowance (reserve price), this translates to $184.1 million in potential proceeds during the remaining eleven auctions during the second compliance period. Using this approach, the average estimated proceeds to New York for each auction would be $16.735 million.

A simplified summary for the second compliance period is shown in Table 1.

[16] Actual emissions may deviate from modeling results for numerous reasons (e.g., the economy, energy efficiency, weather, fuel prices, etc.)

**Table 1. Estimated Proceeds Summary for the Second Compliance Period**

| | |
|---|---|
| Estimated allowances needed to cover emissions | 260.7 million tons |
| Estimated number of allowances acquired through "direct allocation" [17] | 15.7 million tons |
| Estimated number of "second compliance period allowances" acquired at "future vintage auctions" during the first compliance period [18] | 19 million tons |
| Estimated allowances that need to be purchased at auction during the second compliance period | 245 million tons |
| Regional proceeds assuming $1.93/ton | $472.9 million |
| New York's pro-rata share (assumes 38.93%) | $184.1 million |
| New York average estimated quarterly proceeds from "current compliance period" allowance sales | $16.735 million |

In its budgetary process, New York uses fiscal years ending on March 31st. Therefore, the calendar year numbers described earlier in this document are translated to fiscal year values below:

Q2 Calendar Year 2012 = $16.735 million
Q3 Calendar Year 2012 = $16.735 million
Q4 Calendar Year 2012 = $16.735 million
Q1 Calendar Year 2013 = $16.735 million
**Total Estimated Proceeds for FY 2012-13 for Planning Purposes = $66.94 million.**

The same estimate of $66.94 million is used to for fiscal years 2013-2014 and 2014-2015. Therefore, proceeds for the three-year period covered by the Plan are estimated at $200.8 million.

Table 2 reflects these estimated proceeds, and translates these values into estimates of funding available for implementing programs each year by making adjustments for estimated program administration and evaluation costs, ongoing RGGI, Inc. costs, the New York State Cost Recovery Fee, and other factors. As a reference, information about proceeds collected through March 2012 is also included. It should be noted that these estimates assume that no change is made to the regional $CO_2$ cap as a result of the 2012 Program Review.

## Funds Available for Program Implementation

Table 2 translates the projected auction proceed values into anticipated levels of funding available for investment in the programs described in the remainder of the Plan. The table includes expenses related to the repayment of RGGI, Inc. start-up funds to the Systems Benefit Charge program, ongoing RGGI, Inc. costs, State Cost Recovery fees, estimated program administration and evaluation costs, and other factors to arrive at the estimated level of funding available for programs during each year of the three-year planning horizon. As a reference, information about proceeds collected through March 2012 is also included.

[17] This assumes that the ratio of allowances distributed through direct allocation during the second compliance period is similar to the proportion distributed in this manner during the first compliance period.
[18] This estimate was developed at the end of the first compliance period with input from RGGI, Inc. While actual data may have changed, these inputs were used to develop an assumption about future demand, thus remains unchanged here.

**Table 2. Current Actual and Estimated Future Funding [19]**

| | Proceeds through March 2012 ($ millions) | FY 2012-13 ($millions) | FY 2013-14 ($ millions) | FY 2014-15 ($millions) | Total |
|---|---|---|---|---|---|
| Auction Proceeds | $362.0 | $66.9 | $66.9 | $66.9 | $562.7 |
| Allocated Interest | 2.5 | 0.0 | 0.0 | 0.0 | 2.7 |
| Repayment of SBC Funds (for RGGI Inc. Start-up Costs) | (1.6) | | | | (1.6) |
| Estimated Ongoing New York Share of RGGI, Inc. Costs | (2.7) | (0.22) | (0.89) | (0.89) | (4.7) |
| State Cost Recovery Fee | (4.7) | (1.1) | (1.1) | (1.1) | (8.0) |
| Deficit Reduction Plan Transfer to General Fund* | (90.0) | | | | (90.0) |
| Litigation Settlement** | (13.2) | | | (1.1) | (14.3) |
| Program Evaluation | (13.6) | (3.3) | (3.3) | (3.3) | (23.5) |
| Program Administration*** | (19.6) | (5.4) | (5.4) | (5.4) | (35.8) |
| Funds Available for Program Implementation | 219.2 | 56.9 | 56.2 | 55.1 | 387.3 |

**Notes:** Fiscal years begin on April 1st and end on March 31st.
The "Proceeds through March 2012" column covers auctions from December 2008 through March 2012.
* On December 4, 2009, New York State 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.
** The litigation settlement value is an estimate for the first two compliance periods covering 2009 to 2014.
*** Based upon program administration budget rate approved by the Public Service Commission for public benefit energy efficiency and technology and market development programs funded through the System Benefits Charge.

In summary, $362.0 million in proceeds were actually collected through March 31, 2012 and $219.3 million of these funds were made available for program implementation. During the three-year planning horizon for this Plan, additional auction proceeds are estimated to be $200.8 million and $168.2 million of these funds are planned to be made available for programs. Overall, this results in an estimate of $387.3 million in Funds Available for Program Implementation from program inception through the end of fiscal year 2014-15.

The following sections provide more information about the various factors that are netted-out to translate the Auction Proceed estimates into projections of Funds Available for Program Implementation during the three-year planning horizon for this plan.

**Repayment of SBC Funds**
The Public Service Commission issued an Order in Case 05-M-0090, dated August 27, 2007, authorizing that up to $3 million of interest earnings from unexpended SBC funds, be used to finance certain start-up costs of RGGI, Inc., subject to reimbursement. In October of 2009,

[19] Changes in administration values reflect a decrease in expected administration costs from the May 22, 2012 RGGI Operating Plan Amendment; changes in interest represent an anticipated increase from the May 22, 2012 RGGI Operating Plan Amendment.

reimbursement of approximately $1.6 million was made to the SBC account; representing the amount of funds used to finance these start-up costs plus interest.

**Ongoing New York Share of RGGI, Inc. Costs**
RGGI, Inc. is a non-profit corporation created to support development and implementation of New York's (and other participating states') $CO_2$ Budget Trading Programs.

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 programs, 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 $890,000 per year during the planning period. This estimate was derived using the approved 2011 RGGI, Inc. budget.[20]

**State Cost Recovery Fee**
NYSERDA is assessed an annual State Cost Recovery Fee under Section 2975 of the Public Authorities Law for general governmental services. The fee is allocated 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.

**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.

[20] This adjustment reflects a slight increase in cost's to New York as a result of New Jersey's announced departure from the RGGI program.

NYSERDA has paid Con Edison approximately $13.2 million to date. As of March 31, 2012, it is estimated that NYSERDA's future obligations under the settlement agreement will total approximately $1.1 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. Plaintiffs filed a notice of appeal with the Appellate Division, but they have not yet moved forward with the appeal by filing their brief; consequently, it is unknown as to when the appeal will be resolved.

**Program Evaluation and Administration**
Program evaluation and administration costs have been budgeted at five and eight percent, respectively, of total revenues. These figures are consistent with the rates approved by the Public Service Commission for public benefit energy efficiency and technology and market development programs funded through the SBC.

## Summary of Program Implementation Funding

This Operating Plan is primarily focused on describing how $168.2 million in program implementation funds will be used during the three year planning timeframe (fiscal years 2012-13, 2013-14 and 2014-15). However, Table 3 also reflects how the entire $387.3 million in Funds Available for Program Implementation from program inception through the end of fiscal year 2014-15 are anticipated to be encumbered.[21] Furthermore, the ensuing program description sections of this report provide the following information for each program that is anticipated to have funding encumbrances during the three year planning timeframe[22]:

- Program Description
- Three-year Funding Table
- Benefits (measures of program benefits)

[21] Encumbered means funds are obligated under a contract, purchase order, or incentive award.

[22] The Statewide PV program and the Carbon Capture and Sequestration component of the Advanced Power Technology program are not described in this plan since funds were encumbered prior to this three-year planning horizon. Descriptions may be found in the 2010 version of the Plan.

## Table 3. Summary of Actual and Anticipated Funding Commitments[23]

| Program Name | Actual Encumbrance Through March 2012 | Planned Budget[24] FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Total Budgeted Funds Through FY14-15 |
|---|---|---|---|---|---|
| **Cleaner Greener Communities** | **$ 664,938** | **$ 55,593,965** | **$ 34,002,974** | **$ 29,076,480** | **$ 119,338,357** |
| Core Planning and Implementation Grants | 487,707 | 6,377,293 | 2,560,000 | 2,560,000 | $11,985,000 |
| Community Outreach and Support | 177,231 | 49,216,672 | 31,442,974 | 26,516,480 | $ 107,353,357 |
| **Residential Efficiency Services Program** | **$ 15,965,791** | **$ 16,722,315** | **$ 11,670,375** | **$ 10,670,375** | **$ 55,028,856** |
| Residential Green Buildings | 1,825,636 | 2,242,530 | 300,000 | -- | $ 4,368,166 |
| Multifamily Carbon Emissions Reduction Program | 6,371,026 | 628,974 | -- | -- | $ 7,000,000 |
| Multifamily Performance Program | 5,561,748 | 2,545,375 | 3,920,375 | 3,920,375 | $ 15,947,873 |
| Home Performance with ENERGY STAR | 515,813 | 5,134,491 | 2,750,000 | 2,750,000 | $ 11,150,304 |
| EmPower | 1,235,012 | 4,551,408 | 3,000,000 | 3,000,000 | $ 11,786,420 |
| Solar Thermal Incentives[25] | 456,556 | 487,703 | - | - | $ 944,259 |
| Recharge NY Energy Efficiency Program | -- | 1,131,834 | 1,700,000 | 1,000,000 | $ 3,831,834 |
| **Regional Economic Development and GHG Reductions** | **$ --** | **$ 12,000,000** | **$ --** | **$ 6,513,340** | **$ 18,513,340** |
| **Industrial Process Improvement** | **$ 1,617,949** | **$ 11,631,823** | **$ 5,000,000** | **$ 5,000,000** | **$ 23,249,772** |
| **Clean Technology Industrial Development** | **$ 4,750,062** | **$ 15,519,938** | **$ 5,000,000** | **$ 5,000,000** | **$ 30,270,000** |
| **Competitive GHG Reduction Pilot** | **$ --** | **$ --** | **$ 14,500,000** | **$ --** | **$ 14,500,000** |
| **Green Jobs-Green New York[26]** | **$ 35,832,507** | **$ 31,543,333** | **$ 15,476,284** | **$ 14,373,875** | **$ 97,226,000** |
| GJGNY – Residential, One-to-Four Family | 16,291,718 | 18,181,118 | 2,939,053 | 1,836,644 | 39,248,533 |
| GJGNY – Residential, Multifamily | 3,174,622 | 4,272,643 | 4,272,643 | 4,272,643 | 15,992,550 |
| GJGNY - Small Business | 4,412,507 | 6,420,804 | 6,420,803 | 6,420,803 | $ 23,674,917 |
| GJGNY - Workforce | 2,468,644 | 1,843,785 | 1,843,785 | 1,843,785 | $ 8,000,000 |
| GJGNY – Marketing & Outreach | 9,485,016 | 824,984 | -- | -- | $ 10,310,000 |
| **Municipal Water/Wastewater** | **$ 1,608,078** | **$ 933,679** | **$ --** | **$ --** | **$ 2,541,757** |
| **Advanced Transportation Development** | **$ 1,499,727** | **$ 500,273** | **$ --** | **$ --** | **$ 2,000,000** |
| **Advanced Power Technology** | **$ 3,686,869** | **$ 813,131** | **$ --** | **$ --** | **$ 4,500,000** |
| Advanced Clean Power | 2,686,869 | 813,131 | -- | -- | $ 3,500,000 |
| Carbon Capture and Sequestration | 1,000,000 | -- | -- | -- | $ 1,000,000 |
| **Climate Research and Analysis** | **$ 1,798,947** | **$ 5,304,742** | **$ 1,706,846** | **$ --** | **$ 8,810,535** |
| **Statewide PV** | **$ 11,343,741** | **$ --** | **$ --** | **$ --** | **$ 11,343,741** |
| **Total** | **$ 78,768,609** | **$ 160,782,665** | **$ 72,856,479** | **$ 70,634,070** | **$ 387,322,359** |

This table reflects anticipated program budgets as of March 2012. Funding allocations may be refined based upon the actual level of auction allowance proceeds that are received.

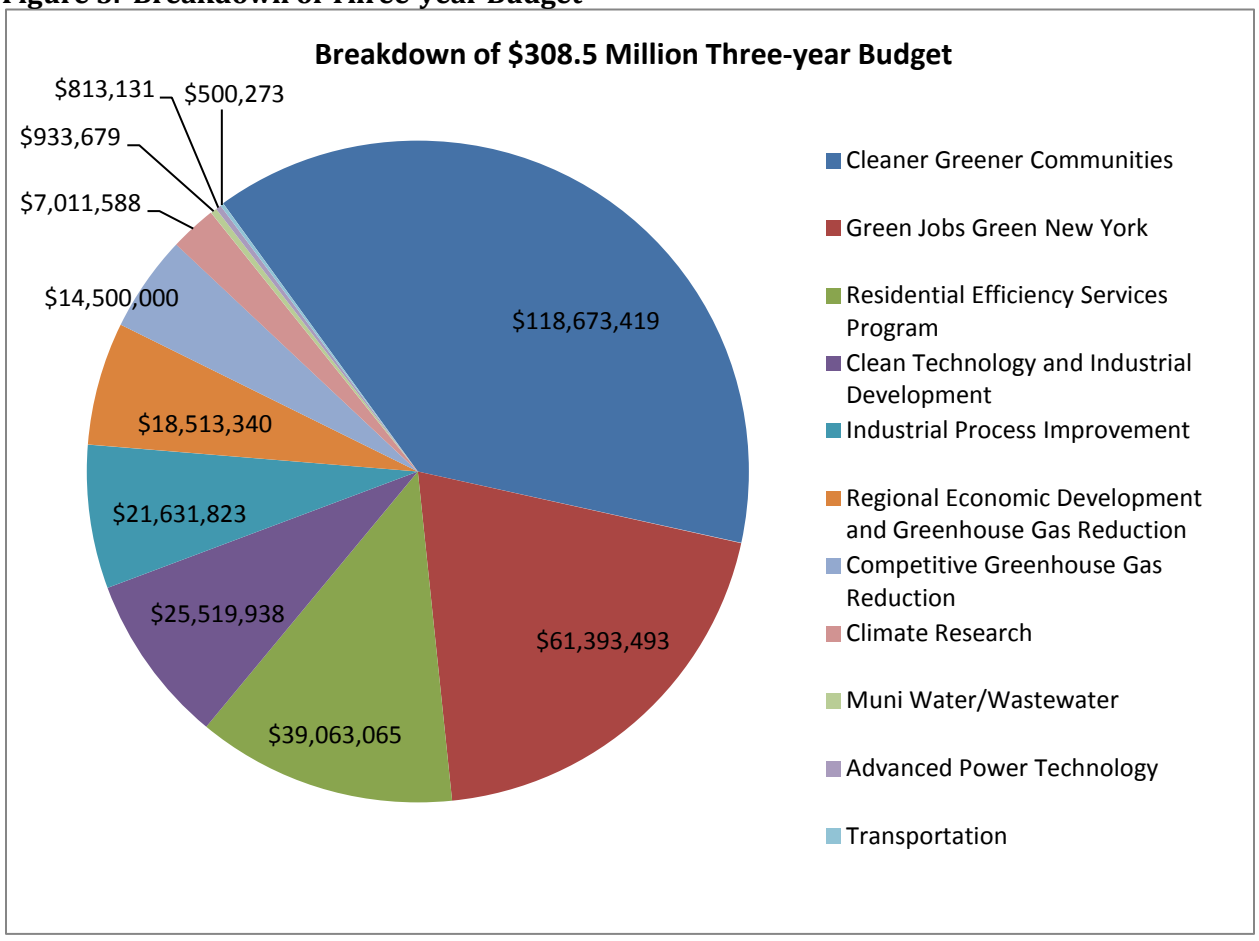
[23] Values may differ slightly from values presented in the May 22, 2012 RGGI Operating Plan Amendment. Changes in values reflect timing of available information on actual auction proceeds as a result of market conditions at different points in time.

[24] Planned Budgets represent both estimated auction proceeds which are to be made available for programs in accordance with the May 22, 2012 RGGI Operating Plan Amendment, and planned expenditures of funding from prior collections that have not yet been committed under contract to specific projects.

[25] Changes in the Solar Thermal budget reflect a reallocation of remaining funds from Statewide PV to Solar Thermal for fiscal year 12-13. While this change was made after the March 31 reporting period covered for this report, this change affected both budgets and projected metrics, and was thus included in this Plan for accuracy.

Figure 3 shows a breakdown of the program funding for the three-year planning period. Planned investment in programs for the three-year planning period totals approximately $308.5 million. Green Jobs-Green New York, Residential Energy Services, Industrial Process Improvement and Municipal Water/Wastewater are the four program areas that are expected to realize savings during the three-year Plan timeframe. These programs represent approximately 46 percent of the three-year funding. The executive summary of this report provides a quantitative estimate of the benefits associated with these three programs during the three-year planning horizon.

**Figure 3. Breakdown of Three-year Budget**



# Cleaner, Greener Communities

## Program Description

This program was announced by Governor Cuomo in his 2011 State of the State address. It will build on the Climate Smart Communities 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 will encourage 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 carbon reductions. The program will emphasize activities associated with smart growth such as creating green jobs, building green infrastructure, investing in environmental justice communities, and strengthening environmental protection.

The program will have two primary components: (1) development of regional sustainable growth plans; and (2) implementation of elements of the sustainability plans. Ten region-specific planning teams have been competitively selected to develop a plan for each of the state's ten Regional Economic Development Council regions.

Approximately 90 percent of the budget will be used to support the implementation component of the program. Funds will be awarded on a competitive basis. Project proposals must address specific items within the region's sustainability plan. Projects that have garnered community acceptance and approval, as well as those that include public-private partnerships, will be encouraged. Consideration will be given to support implementation projects in multiple types of communities (i.e., rural, suburban, and urban communities). RGGI proceeds can be used for the implementation of plan elements that fall within the scope of the permissible use of RGGI proceeds.

Outreach and community support for the overall Cleaner, Greener Communities initiative will be provided in part through Climate Smart Communities and Energy Smart Communities/Economic Development Growth Extension (EDGE) Program. NYSERDA program implementation support will be provided by a competitively selected contractor. The solicitation to select this implementation support contractor is scheduled to be released by November of 2012.

## Funding

This program has a planned three year budget of approximately $118.5 million. The anticipated funding commitments are shown in Table 4.

**Table 4. Cleaner, Greener Communities Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| **Cleaner Greener Communities** | **$ 55,593,965** | **$ 34,002,974** | **$ 29,076,480** | **$ 118,673,419** |
| Core Planning and Implementation Grants | $ 49,216,672 | $ 31,442,974 | $ 26,516,480 | $ 107,176,126 |
| Community Outreach and Support | $ 6,377,293 | $ 2,560,000 | $ 2,560,000 | $ 11,497,293 |

## Benefits

The Cleaner, Greener Communities program will reduce GHG emissions and enhance local planning through development and implementation of regional sustainability plans. The regional sustainability plans will: provide baseline GHG inventories; and describe long-term and short-term sustainability goals for the 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 carbon 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 taxpayer savings. Implementation funding will be provided on a competitive basis for specific projects that provide the greatest opportunities for achieving carbon reductions, energy-efficiency savings, and renewable energy deployment consistent with a region's sustainability plan and Regional Economic Development Council Strategic Plan.

# Residential Efficiency Services Program

## 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. One of the most important benefits of the program has been the discovery and mitigation of significant levels of carbon monoxide in households at all income levels throughout the state. The programs are no longer eligible for SBC funding. 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. Gas 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.

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 Long Island Power Authority (LIPA) and New York Power Authority (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.

**Multifamily Performance Program**
RGGI funding for oil-fired space and domestic water heating efficiency is proposed to supplement the EEPS funding for the Multifamily Performance Program (MPP), which 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 (ERP)" in the program, identify the measures needed to reduce energy use by at least 15 percent. They also develop financing plans for program participants by identifying sources of funding to finance the energy improvements.

RGGI funding will be used to reduce oil and propane energy use 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 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.

**Multifamily Carbon Emission Reduction Program**

RGGI funds will be used to provide financial assistance and technical support to owners of multifamily buildings seeking to convert their heating and domestic hot water systems from those that burn #6 fuel oil to those that burn natural gas, #2 fuel oil, biodiesel, or those that seek to switch to a renewable energy source to supplement their fossil-fuel use. This program is positioned to help encourage early adoption of New York City's phase out of #6 fuel oil and early compliance with potential City-level legislation (Int. 194-2010) that would require all buildings that burn fuel oil to burn biofuel blends (at least B2), and would place sulfur limits on #4 fuel oil. Incentives will be based on the amount of carbon emissions avoided due to the conversion away from the use of #6 fuel oil. The result of this incentive design will be that building owners will reap the biggest financial reward by switching to the least carbon-intensive fuel possible. Participants in the Carbon Reduction Program will also be encouraged to achieve overall higher building energy efficiency through participation in the Multifamily Performance Program.

**EmPower New York**

RGGI funding for oil and propane space and domestic water heating efficiency supplements EEPS funding for EmPower New York (EmPower), which provides cost-effective energy reduction services to households with incomes at or below 60 percent of the State Median Income. The RGGI funding will permit cost-effective oil and propane efficiency measures such as insulation, blower-door assisted air sealing, and heating systems repair and replacements. All households meeting the income eligibility requirements, regardless of electric service provider, will be eligible to apply for heating efficiency assistance. NYSERDA will continue to coordinate closely with the Weatherization Assistance Program (WAP) to ensure effective use of both funding sources.

EmPower is primarily a referral-based program, serving households referred by utilities, Offices for Aging, and other community-based organizations as being payment-troubled. NYSERDA will coordinate with LIPA, NYPA and municipal electric service providers to ensure effective delivery of heating efficiency services to their customers. In the event gas funding is not available to supplement the EmPower program in all gas service territories of the State, NYSERDA may expand use of the RGGI funds for gas-fired heating systems.

**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 the project, through Assisted HPwES.

Eligible electric measures for HPwES will be covered by EEPS funds within the SBC territory. Larger incentives are provided to households whose incomes are below 80 percent of the state or area median income. 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 gas-fired heating equipment.

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

**Green Residential Building Program**

Public Authorities Law (PAL) 1872 directs NYSERDA to create and administer a green residential building program in New York. The Green Residential Building Program (GRBP) is a market transformation initiative designed to change the building practices of the residential building industry for single-family and multifamily homes up to 12 units. Financial incentives will be provided to owners for new green residential buildings and extensively renovated existing residential buildings. Green buildings will reduce energy and GHG production and preserve natural resources. Other benefits are sustainable building materials, reduced waste, improved indoor air quality, and reduced indoor and outdoor pollution.

The program will build on the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Rating Systems and the National Green Building Standard (ICC 700-2008), developed by the National Association of Home Builders in coordination with the American National Standards Institute and the International Codes Council to set the definition of "green" for new residential building construction. A public rulemaking process was undertaken, regulations were promulgated and adopted, and the program officially launched in September 2010.

**Recharge New York Energy Efficiency Program**
Consistent with the Recharge New York Power Program Act,[27] NYSERDA will establish the Recharge New York Energy Efficiency Program for residential electric customers of National Grid, NYSEG and RG&E, who no longer receive the benefit of reduced electricity costs related to purchases of hydroelectric power. NYSERDA will provide incentives to eligible households for energy-efficient products that reduce consumer plug-load. Products under consideration for incentives include advanced power strips, energy saving set-top, boxes or advanced lighting products, all of which would provide ongoing electric savings for years to come.

**Solar Thermal Incentive Program**
RGGI funds will support incentives for the installation of solar thermal systems to replace fossil-fuel domestic hot water systems. Incentives will be available for new and existing multifamily and single-family buildings. RGGI funds may be used to support the installation of residential solar thermal systems through outreach efforts targeted at increasing the market and demand for solar thermal systems.

## Funding

This program has a three year planned budget of approximately $37.9 million. The anticipated funding commitments are shown in Table 5 below.

**Table 5. Residential Efficiency Services - Anticipated Three-year Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| **Residential Efficiency Services** | **$ 16,722,315** | **$ 11,670,375** | **$10,670,375** | **$ 39,063,065** |
| Residential Green Buildings | 2,242,530 | 300,000 | -- | $ 2,542,530 |
| Multifamily Carbon Emissions Reduction Program | 628,974 | -- | -- | $ 628,974 |
| Multifamily Performance Program | 2,545,375 | 3,920,375 | 3,920,375 | $ 10,386,125 |
| Home Performance with ENERGY STAR | 5,134,491 | 2,750,000 | 2,750,000 | $ 10,634,491 |
| EmPower | 4,551,408 | 3,000,000 | 3,000,000 | $ 10,551,408 |
| Solar Thermal Incentives | 487,703 | -- | -- | $ 487,703 |
| Recharge NY Energy Efficiency Program | 1,131,834 | 1,700,000 | 1,000,000 | $ 3,831,834 |

[27] Chapter 60 of the Laws of 2011, Part CC, Section 4.

## Benefits

Table 6 presents anticipated fuel savings, $CO_2$ reductions, and program cost per $CO_2$ ton reduced over the lifetime of the installed measure. Financial savings attributable to the Solar Thermal Incentive Program are included in savings estimates for the programs through which solar thermal systems will be funded.

**Table 6. Residential Efficiency Services Program Three-year Funding and Benefits**

| Program | Total Budget ($ Million) | Number of Participants[1] | 3-Year Electricity Savings (MWh) | 3-Year Fuel Oil Savings (MMBtu)[2] | 3-Year Residual Oil Replacement (MMBtu) | 3-Year Propane Savings (MMBtu) | 3-Year Natural Gas Savings (MMBtu)[2] | 3-Year Steam Savings (MMBtu) | 3-Year $CO_2$ Reduction (Tons)[3] | Program Cost per Ton (Lifetime)[4] |
|---|---|---|---|---|---|---|---|---|---|---|
| Multifamily Performance Program | 10.4 | 15,164 | N/A | 178,484 | N/A | N/A | 190,383 | 27,764 | 27,701 | 22 |
| MPP Market Rate | 7.1 | 9,257 | N/A | 121,486 | N/A | N/A | 129,585 | 18,898 | 18,855 | 22 |
| MPP Low Income | 3.3 | 5,907 | N/A | 56,998 | N/A | N/A | 60,798 | 8,866 | 8,846 | 22 |
| Multifamily Carbon Emission Reduction Program[5] | 0.6 | 2,395 | N/A | (41,085) | 821,690 | N/A | (780,606) | N/A | 19,230 | 10 |
| EmPower New York | 10.6 | 2,562 | N/A | 154,049 | N/A | 66,021 | N/A | N/A | 17,136 | 55 |
| Home Performance with ENERGY STAR | 10.6 | 4,151 | 692 | 379,073 | N/A | 17,135 | (41,784) | N/A | 30,055 | 33 |
| HP Market Rate | 3.8 | 2,710 | 504 | 251,967 | N/A | 16,960 | (28,391) | N/A | 20,341 | 17 |
| HP Low Income | 6.8 | 1,441 | 188 | 127,106 | N/A | 175 | (13,393) | N/A | 9,714 | 65 |
| Green Residential Building Program | 2.5 | 315 | 3,232 | N/A | N/A | 11,141 | 53,085 | N/A | 5,207 | 61 |
| Electricity Efficiency Recharge Program | 3.8 | 103,460 | 37,549 | N/A | N/A | N/A | N/A | N/A | 15,508 | 96 |
| Solar Thermal Incentive Program | 0.5 | 122 | N/A | 2,081 | N/A | 1,021 | 1,609 | N/A | 335 | 219 |
| **Total** | **39.1** | **128,169** | **41,473** | **672,602** | **821,690** | **95,318** | **(577,313)** | **27,764** | **115,171** | **$ 37** |

[1] The number of participants in the multifamily residential sector represents individual units rather than buildings.
[2] 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 florescent lighting eliminates associated resistive heating from incandescent lighting.
[3] 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. It is estimated that 17,000 tons of this program's total three-year $CO_2$ reduction will be attributed to the electric sector, which represents 15 percent of the total reduction.
[4] 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. Future program costs are discounted using a five percent social discount rate.
[5] 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.

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.

# Regional Economic Development and Greenhouse Gas Reductions

## Program Description

This program is designed to support the Governor's transformative plan to improve New York's business climate and stimulate economic growth. To do this, ten Regional Economic Development Councils (REDCs) were established in 2011. Through a performance based, community-driven approach, each REDC has designed and approved a strategic economic development plan for its region. To facilitate the delivery of State support, a Consolidated Funding Application (CFA) was created as the primary mechanism for eligible applicants to submit projects that advance the vision of each strategic plan. Within each of the REDC plans, clean energy strategies and opportunities have been identified as priority needs.

The Regional Economic Development and GHG Reduction program supports projects that are identified as priority initiatives consistent with a Regional Economic Development Council Strategic Plan and that are not otherwise provided financial support by other authority programs or initiatives. The Program provides costshare funding for energy efficiency, clean and renewable energy, and/or innovative carbon abatement projects that address the regional priorities of the REDCs, results in strategic investments, and builds the capacity within the region to participate in the State's clean energy economy. Projects selected are capable of moving forward in the near term, while positioning the region for long term economic growth. The Program complements other funding available through NYSERDA, but does not duplicate funds which are otherwise available from NYSERDA programs. Project funds can be used for implementation of measures and equipment including project design and engineering costs, infrastructure investments, and for demonstrations of new and emerging technologies and approaches. Given the focus on near-term benefits, funds were not made available for research and development projects or for product development. Eligible sectors include businesses, agri-businesses, municipalities (counties, towns, cities, or villages), local development corporations, business or municipal improvement districts, public and private institutions (e.g. universities, colleges, hospitals, schools), and not-for-profits. The Program focuses on several end-uses including: Transportation, Manufacturing and Industrial Process, Buildings, Agriculture, Municipal process, Renewable Electric Generation, and District Energy.

## Funding

This program has a planned three year budget of approximately $18.5 million. The anticipated funding commitments are shown in Table 7.

**Table 7. Regional Economic Development and Greenhouse Gas Reductions Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| **Regional Economic Development and GHG Reductions** | **$ 12,000,000** | **$ --** | **$ 6,513,340** | **$ 18,513,340** |

## Benefits

The Regional Economic Development and Greenhouse Gas Reductions Program will reduce GHG emissions and enhance regional economic development.

The projects funded under the Regional Economic Development and Greenhouse Gas Reduction Program are varied in sector and scope. As a result the benefits are similarly varied and matched to project specific characteristics. All projects must demonstrate GHG reduction and economic benefits. Some of the kinds of benefits that will result from selected projects include: long-term and short-term job creation, efficiency improvements, increased use of renewable energy sources, pollution prevention, abatement of fuel use (including gasoline, oil, propane, diesel, and other fuel types measured in gallons), annual electric savings (in kWh), annual natural gas savings (in MMBTUs), and associated emissions reductions.

# Industrial Process Improvement

## Program Description

The Industrial Process Improvement funds will be targeted for three industrial initiatives that are an evolution of the existing industrial programs. The project selection process will take into consideration fuel cycle GHG emissions. The activities will also help to create, attract, and grow industries in New York that can exploit emerging business opportunities in clean energy and environmental technologies while supporting the goal of carbon mitigation. Funds will be used in a manner consistent with the regulations governing use of RGGI proceeds. The initiatives will be coordinated with the Regional Economic Development Councils.

The first program component will focus on accelerating the adoption of emerging technologies that will improve the energy efficiency of industrial processes and data center operations in New York. The projects will focus on technical innovations that have high replication potential and are cost-effective. The second component will provide assistance for the development of manufacturing methods and tools to enable the efficient mass production of clean energy technologies (e.g., PV or energy storage) in New York. The third component will support development and demonstration of advanced manufacturing technologies that significantly reduce the energy intensity of industrial processes in New York.

## Funding

This program has a three-year planned budget of approximately $21.6 million. The anticipated funding commitments are shown in Table 8.

**Table 8. Industrial Process Improvement Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Industrial Process Improvement | $ 11,631,823 | $ 5,000,000 | $ 5,000,000 | $ 21,631,823 |

## Benefits

The Industrial Process Improvement program supports a variety of initiatives. Qualitative and quantitative benefits vary based on the characteristics of each of these initiatives.

The Industrial Process Improvement initiatives support the achievement of the program selection criteria by:

- Investing in technology that has significant potential to reduce GHG emissions in New York.
- Providing other benefits, specifically economic development benefits associated with technology application at existing industrial and commercial facilities, with potential spill-over replication benefits at large multifamily facilities, and product development in New York industries.

For example, the Data Center program supports the development and validation of technologies that improve the energy-efficiency of IT hardware and associated supporting infrastructure. The program also aims to increase the penetration and integration of environmentally preferred power generation technologies within data centers. The goals of the program are to support technology development, analyze business cases, increase industry awareness of emerging technologies and best practices, and validate performance to a degree that would allow for inclusion in NYSERDA's and utility deployment programs and accelerate market adoption.

It is expected that energy and carbon emission savings will be realized through supported demonstration projects and market replication. Product development projects also present the possibility of carbon and energy savings, but only after commercialization and deployment of those technologies; these savings will be directly related to the number of units sold. All supported projects may also yield business development metrics (e.g. patents, sales, license agreements, etc.) and the opportunity for increasing industry awareness. However, since the program is relatively new and the technologies supported are inherently early and/or under-utilized, savings cannot be forecasted at this time.

Table 9 presents anticipated fuel savings, $CO_2$ reductions, and program cost per $CO_2$ ton reduced over the lifetime of the installed measure.

**Table 9. Industrial Process Improvement Program Three-year Funding and Benefits**

| Program | Total Budget ($ Million) | Number of Participants | 3-Year Electricity Savings (MWh) | 3-Year Fuel Oil Savings (MMBtu) | 3-Year Propane Savings (MMBtu) | 3-Year Natural Gas Savings (MMBtu) | 3-Year CO2 Reduction (Tons)[1] | Program Cost per Ton (Lifetime)[2] |
|---|---|---|---|---|---|---|---|---|
| Industrial Process Improvement | 21.6 | 77 | 19,386 | 77,545 | 51,697 | 387,727 | 39,865 | 110 |

[1] 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. It is estimated that 8,000 tons of this program's total three-year $CO_2$ reduction will be attributed to the electric sector, which represents 20 percent of the total reduction.

[2] 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. Future program costs are discounted using a five percent social discount rate.

Additionally, the Industrial Process Improvement program anticipates working with up to 77 companies, and leveraging outside funding sources in excess of $21.6 million.

# Clean Technology Industrial Development

## Program Description

The Clean Technology Industrial Development program seeks to create, attract, and grow industries in New York that can exploit 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. The program will emphasize 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 technology products from the development/demonstration stage to the launch of commercial-scale manufacturing. 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 could include programs targeting the commercialization of academic, private and public research along with programs to support companies with technologies that are beyond the prototype stage.
- 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 will establish a CIGS manufacturing development facility in Albany, NY that PV companies and researchers can use for product prototyping, demonstration, and pilot-scale manufacturing. This 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 PV products.

## Funding

This program has a three-year planned budget of approximately $25.5 million. The anticipated funding commitments are shown in **Error! Reference source not found.**.

**Table 10. Clean Technology Industrial Development Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Clean Technology Industrial Development | $ 15,519,938 | $ 5,000,000 | $ 5,000,000 | $ 25,519,938 |

## Benefits

The Clean Technology Industrial Development program coincides with the program selection criteria in the following ways:

- Invests in businesses involved with technologies that have long-range potential to reduce GHG emissions in New York.
- Supports the establishment of public-private product development and applied research facilities to bring renewable energy technologies to market.
- Partners with firms to move new technologies from the development stage to the manufacturing stage.
- Provides other benefits to New York, such as the potential to create jobs, leverage capital investment to promote economic development.

Table 11 below presents anticipated benefits from the program portfolio.

**Table 11. Clean Technology Industrial Development Program – Anticipated Benefits**

| Clean Tech and Industrial Development Funding Benefits | Three-year Projected Total |
|---|---|
| Projects with NY Companies/Clients | 69 |
| New Businesses in NY | 5 |
| Full Time Employees | 20 |
| Funds Leveraged | $68,750,000 |

# Competitive Greenhouse Gas Reduction (CGGR) Pilot

## Program Description

Under this program, a competitive solicitation(s) will be developed and issued for market-ready projects that reduce GHG emissions in New York. Projects will be selected based on a combination of technical merit/replication potential and cost of delivering GHG reductions. The power sector will be the initial focus of the program. It is anticipated that projects could include, but not be limited to, supply-side energy efficiency and advanced controls that will reduce GHG emissions cost-effectively. If additional funds become available, the scope of future program initiatives could be broadened to include other sectors.

## Funding

This program has a planned budget for fiscal year 2013-14 of approximately $14.5 million. The anticipated funding commitments are shown in **Error! Reference source not found.**

**Table 12. Competitive Greenhouse Gas Reduction Pilot - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Competitive GHG Reduction Pilot | $ -- | $ 14,500,000 | $ -- | $ 14,500,000 |

## Benefits

The CGGR program will address the program selection criteria and provide the benefits described below:

- Provide a framework for marketplace participants to compete for funding to support large GHG reduction projects primarily on a cost-per-ton of $CO_2$ equivalent basis
- Reduce the costs of achieving the reduction goals of the $CO_2$ budget trading program by achieving $CO_2$ reduction through more efficient electricity generation, and
- Result in additional benefits including job creation, leveraged capital investment to promote economic development, and environmental benefits.

The CGGR program is expected to attract a mix of proposals from the power generation sector for varied technologies and GHG reduction strategies. NYSERDA anticipates bid prices could range from $5 to $30 per ton and total funding could deliver 500,000 to 3,000,000 tons of $CO_2$ reductions.

# Green Jobs - Green New York

## Program Description

Green Jobs-Green New York (GJGNY) is a statewide program to promote energy efficiency and the installation of clean technologies to reduce energy costs and GHG emissions. The Program provides subsidized energy audits to single family, multifamily, small business, and not-for-profit building owners. The Program also provides low-interest financing options for the completion of energy-efficiency services. These options will include NYSERDA program loans and on-bill recovery financing wherein loan repayment occurs through an installment charge on the customer's utility bill. Moreover, the program supports sustainable community development and creates opportunities for green jobs.

Workforce development efforts funded under GJGNY are aligned with program strategies that promote the widespread implementation of energy efficiency and clean energy measures. The program is designed to help provide meaningful employment opportunities for displaced workers, the long-term unemployed, and new workforce entrants. Participants in the GJGNY program are also eligible to take advantage of other programs that provide incentives for implementing measures that are identified in energy audits.

Please refer to the Green Jobs-Green New York Operating Plan for more details on the Program: http://www.nyserda.ny.gov/Green-Jobs-Green-New-York/Reports-and-Operating-Plans.aspx

## Funding

This program has a three-year planned budget of approximately $61.4 million. The anticipated funding commitments are shown in Table 13. Green Jobs - Green New York Anticipated Three-year Funding Commitments below.

**Table 13. Green Jobs - Green New York Anticipated Three-year Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| **Green Jobs-Green New York** | **$ 31,543,333** | **$ 15,476,284** | **$ 14,373,875** | **$ 61,393,493** |
| GJGNY - Residential– Residential, One-to-Four Family | 18,181,118 | 2,939,053 | 1,836,644 | 22,956,815 |
| GJGNY – Residential, Multifamily | 4,272,643 | 4,272,643 | 4,272,643 | 12,817,928 |
| GJGNY - Small Business | 6,420,804 | 6,420,803 | 6,420,803 | 19,262,410 |
| GJGNY - Workforce | 1,843,785 | 1,843,785 | 1,843,785 | 5,531,356 |
| GJGNY – Marketing & Outreach | 824,984 | -- | -- | 824,984 |

## Benefits

The GJGNY Program serves as a point of entry into existing energy-efficiency programs for prospective projects through the audit and financing offerings. It is anticipated that only a small portion of these projects will proceed solely through a GJGNY-funded audit or loan and without incentives from NYSERDA or another Program Administrator(s). In the 2010 Operating Plan, an attempt was made to attribute savings across various funding sources. The effect on the RGGI Operating Plan was that no savings were given to the GJGNY Program for projects that program staff believed would receive other support besides just an audit and/or loan. Since that time, experience has shown that it is extremely difficult to predict how much implementation of audit recommended measures will go through incentive programs previously identified. Additionally, management has agreed that reporting on each respective portfolio of coordinating programs such as RGGI/GJGNY and EEPS will state the full benefits contributed to by each funding source, and Authority-wide reporting will ensure there is no double counting. Therefore, the Plan does not attempt to disaggregate savings by funding source.

Table 14 presents anticipated fuel savings, $CO_2$ reductions, and program cost per $CO_2$ ton reduced over the lifetime of the installed measure.

**Table 14. Green Jobs - Green New York Program Three-year Funding and Benefits**

| Program[1] | Total Budget ($ Million) | Number of Participants[2] | 3-Year Electricity Savings (MWh) | 3-Year Fuel Oil Savings (MMBtu) | 3-Year Propane Savings (MMBtu) | 3-Year Natural Gas Savings (MMBtu) | 3-Year Steam Savings (MMBtu) | 3-Year Kerosene Savings (MMBtu) | 3-Year Wood Savings (MMBtu) | 3-Year $CO_2$ Reduction (Tons)[3] | Program Cost per Ton (Lifetime)[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Residential | 35.8 | 71,419 | 6,873 | 148,687 | 28,987 | 362,184 | 75,804 | 1,209 | 3,112 | 43,613 | $71 |
| Residential - One-to-Four Family | 23.0 | 30,003 | 6,430 | 144,926 | 28,987 | 353,407 | N/A | 1,209 | 3,112 | 37,327 | $57 |
| Residential - MultiFamily | 12.8 | 41,416 | 444 | 3,762 | N/A | 8,777 | 75,804 | N/A | N/A | 6,285 | $131 |
| Small Business/ Not-for-Profit | 19.3 | 3,764 | 11,972 | 26,890 | 2,316 | 59,968 | N/A | N/A | N/A | 10,749 | $193 |
| **Total** | **55.0** | **75,183** | **18,846** | **175,577** | **31,304** | **422,152** | **75,804** | **1,209** | **3,112** | **54,362** | **$90** |

[1] 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.

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

[3] 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. Nevertheless, 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. It is estimated that 7,800 tons of this program's total three-year $CO_2$ reduction will be attributed to the electric sector, which represents 14 percent of the total reduction.

[4] 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. Future program costs are discounted using a five percent social discount rate.

With regard to the selection criteria, 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.

# Municipal Water and Wastewater

## Program Description

A unique opportunity exists to coordinate RGGI climate change goals and funding with federal goals and funding while installing infrastructure that will improve the environment and keep New York waters clean and healthy. New York has been working to secure federal funds that will bolster efforts to finance a new generation of water and wastewater infrastructure via the Clean Water and Drinking Water State Revolving Fund Programs. The U.S. Environmental Protection Agency (EPA) has dedicated funds under the Green Project Reserve to promote energy efficiency and green projects. Plants financed through the State Revolving Fund can be constructed to the most energy-efficient levels, thus minimizing carbon emissions and improving their economic and environmental performance.

Under the Operating Plan, the New York State Environmental Facilities Corporation (EFC) and NYSERDA will co-managed a program to analyze and finance projects in participating communities. EFC and NYSERDA will review projects on the State Revolving Fund Intended Use Plan (SRF IUP), including likely recipients of EPA Green Project Reserve funds, and identify candidates for likely energy-efficiency opportunities. Municipalities of all sizes were targeted in the past for Green Project Reserve funds, these funds are now primarily dedicated to smaller, economically disadvantaged communities.

Selected projects will undergo technical analysis to identify costs and savings associated with energy efficiency, process improvements, and carbon abatement opportunities. NYSERDA will secure one or more experienced New York water and wastewater consultants to perform the analysis and to assist participant communities by providing information and assistance with project application procedures and processes. EFC and NYSERDA will work together to develop project proposals for presentation to participant communities. Project installations will be cost-shared through New York State Revolving Fund program administered by EFC. The result will be lower operating cost for the site communities and reduced climate impacts over the potentially decades-long lifetime of the infrastructure.

## Funding

This program has a fiscal year 2012-13 budget of approximately $0.9 million. The anticipated funding commitments are shown in Table 15 .

**Table 15. Municipal Water and Wastewater Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Municipal Water/Wastewater | $ 933,679 | $ -- | $ -- | $ 933,679 |

## Benefits

Table 16 presents anticipated fuel savings, $CO_2$ reductions, and program cost per $CO_2$ ton reduced over the lifetime of the installed measure.

**Table 16. Municipal Water and Wastewater Program Three-year Funding and Benefits**

| Program | Total Budget ($ Million) | Number of Participants | 3-Year Electricity Savings (MWh) | 3-Year Fuel Oil Savings (MMBtu) | 3-Year Natural Gas Savings (MMBtu) | 3-Year CO2 Reduction (Tons)[1] | Program Cost per Ton (Lifetime)[2] |
|---|---|---|---|---|---|---|---|
| Municipal Water and Wastewater | 0.9 | 10 | 6,645 | 3,876 | 3,471 | 3,260 | 43 |

[1] 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. Nevertheless, 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. It is estimated that 2,700 tons of this program's total three-year $CO_2$ reduction will be attributed to the electric sector, which represents 84 percent of the total reduction.

[2] 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. Future program costs are discounted using a five percent social discount rate.

The water and wastewater treatment efficiency initiative will address the program selection criteria in the following manner:

- The program will provide cost-effective $CO_2$ reductions through energy-efficiency improvement to water and wastewater treatment plants. It is anticipated that the improvements will be primarily electric efficiency.
- Through investments in electric reduction, the program will help reduce the overall compliance costs of the $CO_2$ budget trading program.
- This program will provide numerous additional benefits including improved water quality for New York residents, leveraging of federal funds, and increased employment opportunities that result from these infrastructure projects.

# Advanced Transportation Development

## Program Description

Vehicle tailpipe emissions are the largest single contributor to urban air pollution. 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. The program will support the development of surface transportation, including infrastructure for plug-in electric vehicles, the development and demonstration of emerging technologies that improve rail, marine, and air transportation system efficiency. This includes technologies that improve on and off road vehicle efficiency such as hybrid-electric and hydraulic launch assist drive trains, efficient alternators, and idle-stop systems for urban duty vehicles (e.g., taxis, delivery trucks, and buses). 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.

## Funding

This program has a planned budget for fiscal year 2012-13 of approximately $0.5 million. The anticipated funding commitments are shown in Table 17.

**Table 17. Advanced Transportation Development Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Advanced Transportation Development | $ 500,273 | $ -- | $ -- | $ 500,273 |

## Benefits

The Advanced Transportation Development 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. Projects that reduce the demand or 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.

Projects selected with remaining funds will have metrics typical of the existing portfolio. For demonstration projects there will be fuel and emissions savings and for product development efforts there will be outcomes such as patents, license agreements, sales, etc. The current portfolio has an array of projects mainly dealing with on-road transportation and concentrating on vehicles, infrastructure, logistics and fuel.

Examples of projects funded under this program are:

Development of a Regenerative Shock Absorber:
SUNY Stony Brook has completed the preliminary design of three types of regenerative shock absorbers which convert the energy captured by vehicle shock absorbers into electricity. This energy is normally shed as waste heat; however, the regenerative shock absorber converts it to electricity that can be used for vehicle propulsion and reduce the need for gasoline or other non-renewable energy sources. The research team recently signed a technology license agreement with a company interested in developing commercial applications.

Demonstration of a Plug-In Hybrid Rental Model:
This project explores the use of the General Motors Chevy Volt in rental fleets. This vehicle is a plug-in hybrid capable of driving 35 miles only on electricity before switching to hybrid mode. In the summer of 2012, eight Volts and associated charging infrastructure were placed in operation at locations in the New York City metro area. Data reports should be received starting in the fourth quarter of CY 2012. Savings estimated are a reduction in the consumption of petroleum products, a decrease in production of GHGs, and reduced human exposure to harmful pollutants.

# Advanced Power Technology

## Program Description

The Advanced Power Technology Program (APTP) is focused on reducing GHG emissions in the long term. During the next three years, this program will focus on innovative methods of clean power generation and support pre-development activities for a broad range of promising renewable energy technologies in New York; including biomass, tidal/hydro, solar and wind technologies. The RGGI funds will leverage and fill gaps in state and federal funding including SBC Technology & Market Development funds.

## Funding

This program has a three-year budget of approximately $0.8 million for expenditure in fiscal year 2012-13. The anticipated funding commitments are shown in Table 18.

**Table 18. Advanced Power Technology Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY112-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| **Advanced Power Technology** | **$ 813,131** | **$ --** | **$ --** | **$ 813,131** |
| Advanced Clean Power | $ 813,131 | $ -- | $ -- | $ 813,131 |

## Benefits

These activities will address the following program selection criteria:

- Invest in technology with significant potential to reduce GHG emissions in New York.
- Help to reduce the cost of achieving the emissions reduction goals of the $CO_2$ budget trading program by decreasing reliance on GHG emitting resources.
- Increase long-term potential for new renewable developments to expand prospects for economic development and add environmental benefits.
- Decrease dependency on fuels for power. Distributed generation will ease loads on the utility grid and decrease losses in power transmission.
- Provide financial support for renewable energy generation technologies that cannot compete with other mainstream renewable resources, but will likely become necessary over the long term to achieve renewable energy goals.

Projects selected with remaining funds will have metrics typical of the existing portfolio. For demonstration projects there will be electricity and emissions savings and for product development efforts there will be outcomes such as patents, license agreements, sales, etc. The current portfolio has an array of projects for the development and demonstration of advanced power technologies such as wind turbines, photovoltaic, solar thermal electric, and combined heat and power systems.

Examples of projects funded under this program are:

Phase two development of Wind Plant Analyst tool:
AWS Truewind is developing a Plant Analyst program that is designed to strengthen preventative and predictive maintenance practices which will result in significant revenue benefit over the life of a wind farm. Wind plant performance optimization and improved decision support will yield increased wind plant production. It is estimated that one percent of performance shortfall can be recovered using these methods. There is also significant potential for job growth in New York from product development to application of the tools at a plant level.

Development of graphene as a material for photovoltaic and energy storage applications:
Graphene, a promising new material discovered in 2004, is an atom-thick layer of carbon that has many desirable properties. This makes it suitable for use in energy and power-related devices, including as a transparent electrode for photovoltaics, an ultracapacitor, a battery component, and in a variety of other important applications. Yet it has been difficult to manufacture reliably, in large areas, defect-free, and cost-effectively. The project was designed to develop reproducible, scalable methods and significant progress was made on achieving a number of the project's technical objectives. In addition, Graphene Devices Ltd. established a joint development agreement with a conductive ink supplier; created production facilities at Eastman Business Park with support from Empire State Development; and attracted experienced individuals to join its management team with technical, legal and finance skills.

# Climate Research and Analysis

## Program Description

This aspect of the RGGI program is designed to increase the understanding and awareness of the environmental impacts of energy choices and emerging energy options and provide a scientific foundation for formulating effective, equitable, energy-related environmental policies and resource management practices that can reduce GHGs emissions. The Climate Research and Analysis program will help build an environmental research capability in New York to address critical climate change-related issues facing the State and the region, including the needs of environmental justice communities, and create opportunities for innovation. The program will focus on answering the following questions:

- What are the potential public health, infrastructure, ecological, agricultural and economic impacts of climate change in New York, and how can the associated risks be managed and minimized?
- What are the cost-effective climate change mitigation and adaptation strategies for New York to pursue?
- What are the key parameters that need to be monitored to establish baselines and assess climate change impacts in New York?

This program will use RGGI funding to support the research studies, demonstrations, policy research and analyses, and outreach and education efforts.

## Funding

This program has planned budget of approximately $7.0 million, with expenditures anticipated to occur throughout the three-year term. The anticipated funding commitments are shown in Table 19.

**Table 19. Climate Research and Analysis Program - Anticipated Funding Commitments**

| Program Name | Planned Budget FY12-13 | Planned Budget FY13-14 | Planned Budget FY14-15 | Three-year Total |
|---|---|---|---|---|
| Climate Research and Analysis | $ 5,304,742 | $ 1,706,846 | $ -- | $ 7,011,588 |

## Benefits

These research initiatives are consistent with the program selection criteria and will:

- Inform decisions related to reducing the cost of achieving the emission reduction goals of local, state and regional programs.
- Evaluate and document health and environmental impacts and opportunities.
- Guide 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 program does not lend itself to tracking traditional quantifiable benefits, like GHGs saving. Nevertheless, there are real benefits associated with Climate Research 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 funds leveraged through other funding sources that might not be available but for the cost-sharing opportunities presented through RGGI proceeds. Table 20 presents the anticipated quantitative benefits associated with the Climate Research program over the three-year planning period.

**Table 20. Climate Research and Analysis Program – Anticipated Benefits**

| Climate Research | Three year Projected Total |
|---|---|
| Research Studies | 24 |
| Publications | 24 |
| Conferences, Workshops, and Seminars | 9 |
| Briefings | 18 |
| Funds Leveraged | $1,987,196 |

# Program Evaluation and Reporting

The overarching goals of the RGGI program evaluation are to: provide a credible evaluation of the RGGI program portfolio and individual programs and provide timely information to all stakeholders, including progress toward program and public policy goals, progress in moving markets toward behavior that results in emissions reductions and increased energy efficiency and use of renewable energy, and measuring efficiency and effectiveness of program implementation and administration. Program evaluation will ensure accountability in the use of RGGI funds to meet overall program goals.

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.[28] Evaluation and reporting activities discussed within this section pertain to all other RGGI programs.

## 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 five percent evaluation budget will support: overall design and planning, implementation of plans by third-party contractors, reporting, 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, e-mail, and other types of surveys and interviews.

Some RGGI-funded program activities are substantially different than the programs currently administered through the SBC. NYSERDA will use its best efforts to leverage existing evaluation experience and staffing to maximize economies of scale.

## Evaluation Approach

NYSERDA intends to tailor its evaluation to the specific types of RGGI programs and their approach to achieving $CO_2$ 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 $CO_2$ reductions.

[28] 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 .

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 is described briefly below.

**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: $CO_2$ reductions; electricity and fuel savings; customer bill savings; program cost per ton of $CO_2$ reduced; and job creation.

The types of programs presented in the Plan are expansive in terms of the sectors and fuels covered and the ways in which they reduce $CO_2$. NYSERDA has the most experience evaluating impacts from programs that provide direct emission reductions through on-site electric and fossil-fuel efficiency projects. For programs falling within this category, NYSERDA first plans to measure and verify the electric and fossil-fuel savings attributable to the programs, and then apply emission factors to determine $CO_2$ reductions. Measurement, verification and attribution (net-to-gross) analysis will be conducted on a sample of 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.[29] 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 programs other than those providing emission reductions through on-site energy efficiency and generation projects may be explored in detail by NYSERDA and contractors procured to provide assistance in this area. Generally, these programs will receive appropriate impact, market, and process evaluations. 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 in the evaluation.

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

**Process Evaluation and Market Characterization/Assessment**
Program 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 efficiency and effectiveness.

Market characterization and assessment 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.

**Use of Evaluation Results**
The evaluation and program implementation activities described in this plan will be integrated such that "real time" feedback from the evaluation effort can be 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 by NYSERDA's independent evaluation contractors 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.

## Evaluation Implementation

Evaluation of New York's RGGI programs will be managed by NYSERDA's Performance Management and Evaluation Systems (PMES) group. PMES is organizationally separate from NYSERDA groups that administer programs and staff has been responsible for managing evaluation of NYSERDA's major energy efficiency, electric demand reduction, renewable energy, and research and development programs for more than a decade. The staff and knowledge base within PMES 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.

NYSERDA has recently procured the services of two evaluation contractor teams. One will provide impact evaluation services and the other will provide process evaluation and market characterization/assessment for the RGGI programs. These two contractors will focus on a subset of RGGI programs operating in the deployment space.

A future competitive solicitation will procure a separate contractor to cover impact, process and market evaluation for RGGI programs that focus more on research and technology development and demonstration. NYSERDA elected to parse out these program activities under a separate evaluation contractor due to nature of their approach and expected outcomes. This evaluation contractor will also provide evaluation services for NYSERDA's SBC funded Technology & Market Development Program. This competitive solicitation is expected to be issued in late 2012 and a contractor will be on board in early 2013.

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

Final design and implementation of program-specific evaluation efforts will be undertaken by one or more of NYSERDA's third-party evaluation contractors. Most of the five percent evaluation budget will be allocated to the independent, third-party contractors for design and implementation of the evaluation effort. Relying largely on independent contractors to perform evaluation bolsters program accountability.

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.

## Evaluation and Status Reports

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, an evaluation of the results and impacts of program activities and accomplishments, and an accounting of the administration costs and expenditures. The annual report will also provide information on the geographic distribution of program funding and benefits across the State.

Quarterly, NYSERDA will prepare a RGGI program status report updating progress made in each major program area. The reports will include: a summary description of program activities and implementation, 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, and emissions factors. Furthermore, at the time of development of this Plan, the extent to which program participants will leverage other non-RGGI program support available to them is unknown. The reported actual benefits and outcomes of the RGGI programs may also be supported by other funding sources. Evaluation and status reports will identify leveraging of other non-RGGI program support to the extent it occurs.

# Administration

## 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.

## Procurement Policies and Procedures

In administering all of its programs, including those 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*. Historically, more than 97 percent of NYSERDA's contracts are awarded on a competitive basis. For the remaining three percent, 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.

Programs and contract awards also receive extensive internal review. NYSERDA's Program Planning Committee annually reviews, and NYSERDA's Board approves, a multiyear strategic program plan setting forth NYSERDA's programmatic goals and strategies. Internal oversight of program planning activities is also carried out by a multi-disciplinary Program Development Management Committee (PDMC), consisting of senior management from all NYSERDA units, who review and approve requests for issuance of solicitations and procurement. Solicitations and program contracts are also reviewed and approved by a project team, including program staff and representatives of Contracts Management, Energy Analysis, Communications, and Counsel's Office. 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. The TEP makes recommendations to program staff, who present the results for review and approval to the Management Review Team (comprised of the Vice

President, General Counsel, and Director of Contract Manager) or, at the Vice President's discretion, to the PDMC. A number of NYSERDA programs also provide incentives to any qualified program participant who meets pre-defined program terms and conditions.

## 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 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. Finance department staff checks the mathematical accuracy of the invoice and compliance with contract budget terms. Project management staff ensures that costs are appropriate and the contractor's activities are the statement of work. Contract Management department staff ensure that terms and conditions of the contract requirements, such as insurance, are followed.

NYSERDA uses an automated system that facilitates an accurate and timely accounting of all program expenditures. Staff salary costs charged to the RGGI-funded programs are based upon staff time and the allocation of salary costs to various activity and funding codes. These costs are reviewed and approved quarterly by management. Contractual arrangements and program incentives are entered, maintained, and monitored in the automated accounting system. The system tracks each individual contract or agreement, and records the amount of those expenditures incurred to date.

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.

## Administration Budget

Program administration costs have been budgeted at eight percent of total revenues. This figure is consistent with the rates approved by the Public Service Commission for public benefit energy efficiency and technology and market development programs funded through the SBC.

Many of the RGGI-funded program activities may be substantially different than the programs currently administered through the SBC, therefore, requiring additional staff resources. NYSERDA management will use its best efforts to leverage off existing staff resources to achieve the maximum

level of economies of scale possible. If it is determined, however, that staff resources needed are higher than the amount proposed in the Plan, NYSERDA will present a request to amend the Plan and Program 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. As stated above, these estimates are based on historical experience with the SBC-funded programs, and consider administrative efficiencies.

The staffing plan also acknowledges that while most staff will be needed to support programs during the years that the RGGI funds are auctioned, some will be required for several years after auctions are complete to continue oversight of multi-year programs. The "effective" administrative rate during early years of the RGGI program was approximately five percent to accommodate those expenditures in the later years so that the overall costs would not exceed NYSERDA's administrative cap.

Program staff undertakes a variety of tasks depending on the nature and design of the programs. As approximately 97 percent of NYSERDA contracts are awarded through competitive processes, program staff writes solicitations, manages proposal review processes, develops contracts, and then oversees the performance of the contracts through their duration, including reviewing and verifying invoices, and ensuring that programs are charged appropriately to the related funding sources.

In the energy-efficiency deployment program areas, contracts may include those for program implementation, quality assurance, marketing and outreach, application and incentive processing, technical assistance, workforce training, and other technical support. In the research and development and demonstration areas, contracts may be for technology or product development, pilot demonstrations, data collection and analysis, technical assistance, and business development assistance.

Program staff reviews applications of contractors in the field who desire to become program partners and deliver services. They will provide oversight of the performance of those partners, and work to resolve any issues that may arise between customers and program partners. The staff also assesses individual incentive applications from program partners and buildings, and processes them for payment. They will review individual projects, perform on-site inspections and follow up on quality installation issues and corrective actions.

Other duties of the program staff is to coordinate activities with State agencies, utilities and organizations that have related programs, or may be one of several funding sources, and update program plans as needed to reflect changing market conditions. Finally, program staff collects, reviews and analyzes data, and develops reports.

# Technical Appendix

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.

## 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.

## $CO_2e$ 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,[30] 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,[31] shown in Table TA - 1.

**Table TA - 1. Global Warming Potential**

| Gas | Global Warming Potential |
|---|---|
| Carbon dioxide ($CO_2$) | 1 |
| Methane ($CH_4$) | 21 |
| Nitrous Oxide ($N_2O$) | 310 |

NOTE: These values represent a 100-year time horizon.
Source: Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report: Climate Change 1995.

[30] 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 a specific time interval, which is 100 years for the IPCC Second Assessment Report values.
[31] IPCC,1995. Second Assessment: Climate Change 1995. According to EPA guidance, this inventory uses potentials from the IPCC Second Assessment report, rather than values from the more current Third Assessment: Climate Change 2001 report. New York DEC regulation Part 242 1.2 (49) uses the Third Assessment values. Reconciliation between these two methodologies will be investigated as part of the program implementation and evaluation process.

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

| | **Transport (lb $CO_2e$/MMBtu)** | **Residential (lb $CO_2e$/MMBtu)** | **Commercial (lb $CO_2e$/MMBtu)** | **Industrial (lb $CO_2e$/MMBtu)** |
|---|---|---|---|---|
| Coal | 0.00 | 224.89 | 211.43 | 207.58 |
| Natural Gas | 117.25 | 117.14 | 117.14 | 113.38 |
| #2 Oil/Distillate/ Diesel | 163.22 | 163.78 | 163.78 | 161.80 |
| #6 Oil/Residual | - | - | 166.28 | 174.20 |
| Kerosene | - | 162.10 | 162.10 | 159.89 |
| Propane | 140.51 | 136.94 | 136.94 | 139.45 |
| Gasoline | 159.09 | - | - | - |
| Aviation Fuel | 160.86 | - | - | - |
| Wood | - | 15.79 | 15.79 | 3.92 |

Sources: EPA's Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2006, Annexes 2 & 3 and EPA State Climate Energy Program's State Inventory Tools released on 1/3/2011

An average emission factor of 826 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.[32] 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.

## Bill Savings

Annual bill savings values for each program are estimated by multiplying the energy savings by sector-specific fuel price data. Table TA - 3 shows fuel prices by sector. Electricity prices represent average values for six service territories and exclude basic service charges.

[32]The emission factor for electricity is based on data from *Patterns & Trends- New York State Energy Profiles: 1994 – 2008* (NYSERDA, January 2010) and methodology from the GHG Inventory and Forecast prepared for the 2009 New York State Energy Plan (August 2009).

**Table TA - 3. Fuel Prices by Sector**

| Sector | Electricity ($/kWh) | Natural Gas ($/MMBtu) | Fuel Oil / Distillate ($/MMBtu) | Propane ($/MMBtu) | Residual ($/MMBTU) |
|---|---|---|---|---|---|
| Residential | 0.148 | 12.22 | 18.78 | 30.62 | N/A |
| Commercial | 0.176 | 9.87 | 14.91 | 22.23 | 9.94 |
| Industrial | 0.088 | 9.66 | 14.26 | 23.2 | 9.94 |
| Transportation | 0.05 | N/A | 18.12 | N/A | N/A |
| C&I | 0.132 | 9.765 | 14.585 | 22.715 | 9.94 |

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

*To learn more about NYSERDA programs and funding opportunities visit nyserda.ny.gov*

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# Operating Plan for Investments in New York Under the $CO_2$ Budget Trading Program and the $CO_2$ Allowance Auction Program

November 15, 2012

**State of New York**
Andrew M. Cuomo, Governor

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