

New York State Energy Research and Development Authority

New York's Regional Greenhouse Gas Initiative-Funded Programs Annual Status Report

Quarter Ending December 31, 2014

Final Report

April 2015

NYSERDA's Promise to New Yorkers:

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

Mission Statement:

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

Vision Statement:

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

Core Values:

Objectivity, integrity, public service, partnership, and innovation.

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 and Renewable Energy Deployment

Helping New York State to achieve its aggressive energy efficiency and renewable energy goals – including programs to motivate increased efficiency in energy consumption by consumers (residential, commercial, municipal, institutional, industrial, and transportation), to increase production by renewable power suppliers, to support market transformation, and to provide financing.

Energy Technology Innovation and Business Development

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

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, 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 in New York State – 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 New York State policymakers 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, emergency preparedness, and a range of energy data reporting.

**New York's Regional Greenhouse Gas
Initiative-Funded Programs
Annual Status Report
Quarter Ending December 31, 2014**

Final Report

Prepared by:

New York State Energy Research and Development Authority

April 2015

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Acronyms and Abbreviations

| | |
|--------------|--|
| AHPwES | Assisted Home Performance with ENERGY STAR® |
| CBO | constituency-based organization |
| CGC | Cleaner, Greener Communities |
| CO2 | carbon dioxide |
| CO2e | carbon dioxide equivalents |
| EEPS | Energy Efficiency Portfolio Standard |
| EFC | New York State Environmental Facilities Corporation |
| EPA | U.S. Environmental Protection Agency |
| ERP | Energy Reduction Plan |
| GHG | greenhouse gas |
| GJGNY | Green Jobs - Green New York |
| HPwES | Home Performance with ENERGY STAR® |
| kW | kilowatt |
| kWh | kilowatt-hour |
| LIPA | Long Island Power Authority |
| MMBtu | million British thermal units |
| MPP | Multifamily Performance Program |
| MW | megawatt |
| MWh | megawatt-hour |
| NYPA | New York Power Authority |
| NYS or State | New York State |
| NYSDOL | New York State Department of Labor |
| NYSERDA | New York State Energy Research and Development Authority |
| OBR | On-Bill Recovery Financing Program |
| PON | Program Opportunity Notice |
| PV | photovoltaic (also known as solar electric) |
| RFP | request for proposals |
| RGGI | Regional Greenhouse Gas Initiative |
| RPS | Renewable Portfolio Standard |
| SBC | System Benefits Charge |
| ST | solar thermal |
| WFD | Workforce Training and Development |

1 Introduction

To implement the Regional Greenhouse Gas Initiative (RGGI), New York State (NYS or the State) established its Carbon Dioxide (CO₂) Budget Trading Program through regulations promulgated by the Department of Environmental Conservation (DEC) and the CO₂ Allowance Auction Program through regulations promulgated by the New York State Energy Research and Development Authority (NYSERDA). This report is prepared pursuant to the New York's Regional Greenhouse Gas Initiative Investment Plan (2014 Operating Plan) and provides an update on the progress of programs through the quarter ending December 31, 2014. It contains an accounting of program spending, an estimate of program benefits, and a summary description of program activities, implementation, and evaluation. An amendment providing updated program descriptions and funding levels for the 2014 version of the Operating Plan was approved by NYSEERDA's Board on June 24, 2014.

New York State invests RGGI proceeds to support comprehensive strategies that best achieve the RGGI CO₂ emission reduction goals. These strategies aim to reduce global climate change and pollution through energy efficiency, renewable energy, and carbon abatement technology. Deploying commercially available renewable energy and energy efficiency technologies helps to reduce greenhouse gas (GHG) emissions from both electricity and other energy sources in the short term. To move the State toward a more sustainable future, RGGI funds are used to empower communities to make decisions that prompt the use of cleaner and more energy efficient technologies that lead to lower carbon emissions as well as economic and societal co-benefits. RGGI helps to build capacity for long-term carbon reduction by training workers and partnering with industry. Using innovative financing, RGGI supports the pursuit of cleaner, more efficient energy systems and encourages investment to stimulate entrepreneurial growth of clean energy companies. All of these activities use funds in ways that accelerate the uptake of low-emitting technologies.

2 Summary of Portfolio and Program Benefits

An overview of the quantifiable benefits that are expected to be achieved with expended and encumbered funds through this quarter related to carbon dioxide equivalent (CO₂e) reductions, energy savings, and energy bill savings is presented in this section. For more information on the methodology used to calculate CO₂e reductions and energy bill savings, see Appendix A. Former program names are listed in Appendix B. Detailed benefits results are presented in Appendix C.

The estimated cumulative annualized and expected lifetime benefits as of December 31, 2014, at the portfolio and program levels, are shown in Table 1 and Table 2, respectively.¹ Investment benefits are further compared by fuel type in Figure 1. NYSERDA begins tracking program benefits once projects have been installed, and provides estimated benefits for projects under contract but not yet operational (pipeline benefits). These benefits are estimated based on the expected lifetime benefits from installed and pipeline savings. The metrics presented in this section are estimates and have not been evaluated. When evaluation results are available, they will be presented in future Evaluation and Status Reports, which will include these metrics along with macroeconomic indicators such as job creation resulting from program activity. The reporting of fund transfers may lag behind the installation date such that program benefits are reported prior to the financial reporting of funds spent. At this time, the program benefits include some projects that are also supported by other non-RGGI funding sources administered by NYSERDA.

Figure 1 shows energy savings, emission reductions, and participant energy bill savings realized through RGGI-funded projects by project fuel type as of December 31, 2014.

Key observations during this quarter:

- Energy efficiency comprised 37% of energy savings, 23% of emission reductions, and 38% of bill savings.
- #2 oil comprised 26% of energy savings, 42% of emission reductions, and 38% of bill savings.
- Natural gas comprised 21% of energy savings, 24% of emission reductions, and 8% of bill savings.
- #2 oil accounts for a much larger share of emission reductions and bill savings than natural gas because natural gas emits less carbon dioxide and costs less per unit of energy produced.

¹ Cumulative annual benefits are reflective of the annual impacts from all currently operational projects installed, projects under a signed contract and projects with an application received that are not yet operational since program inception. Expected lifetime benefits are reflective of the total impacts over the entire lifecycle from all currently operational projects installed, projects under a signed contract and projects with an application received that are not yet operational since program inception. Please see Table A-4 in Appendix A for the measure-life assumptions.

- Renewable generation comprised 14% of energy savings, 9% of emission reductions, and 15% of bill savings.
- Renewable generation and energy efficiency are responsible for a relatively small share of emission reductions in part because the average emissions factor for in-state electricity generation has diminished over the past decade with the retirement of coal generators and addition of new renewable energy sources.
- Other fuels (including propane, steam, wood, kerosene, coal, and #6 oil) comprised 2% of energy savings, 2% of emission reductions, and 1% of bill savings.

To highlight the diversity and effectiveness of the RGGI portfolio, this report includes success stories of projects that are advancing the previously stated strategies.

Table 1. Summary of Expected Cumulative Portfolio Benefits through December 31, 2014

| Benefits through December 31, 2014^a | Net Greenhouse Gas Emission Savings^b (Tons CO₂e^c) | Total Net Fuel Savings (MMBtu)^f | Net Efficiency Electricity Savings (MWh) | Net Renewable Energy Generation (MWh) | Total Net Electricity Savings/Generation (MWh) | Energy Bill Savings to Participating Customers (\$ Million)^g |
|--|---|---|---|--|---|--|
| Cumulative Annualized Installed Savings^d | 178,048 | 1,503,898 | 115,024 | 44,470 | 159,495 | 53.4 |
| Cumulative Annualized Pipeline Savings^e | 83,118 | 684,598 | 79,426 | 17,075 | 96,501 | 27.1 |
| Cumulative Annualized Committed Savings^f | 261,165 | 2,188,496 | 194,450 | 61,546 | 255,996 | 80.5 |
| Expected Lifetime Total Savings^g | 4,902,226 | 42,979,067 | 3,249,964 | 1,538,646 | 4,788,609 | 1,627.1 |

^a Cross-program overlap for projects that received any combination of a Green Jobs - Green New York (GJGNY) assessment, a GJGNY loan, or a RGGI-funded incentive through the Home Performance with ENERGY STAR[®] Program has been removed.

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

^c CO₂e stands for carbon dioxide equivalent and describes the amount of CO₂ that would have the same global warming potential as a given mixture of gases based on factors published by the Intergovernmental Panel on Climate Change.

^d Inclusive of savings from all currently operational projects installed since program inception.

^e Inclusive of savings from all projects under a signed contract and projects with an application received that are not yet operational.

^f The sum of Installed Savings and Pipeline Savings.

^g The expected benefits over the lifetime of all operational projects, projects under a signed contract, and projects with an application received that are not yet operational. See Table A-4 in Appendix A for the measure-life assumptions.

Table 2. Summary of Expected Cumulative Annualized Program Benefits through December 31, 2014

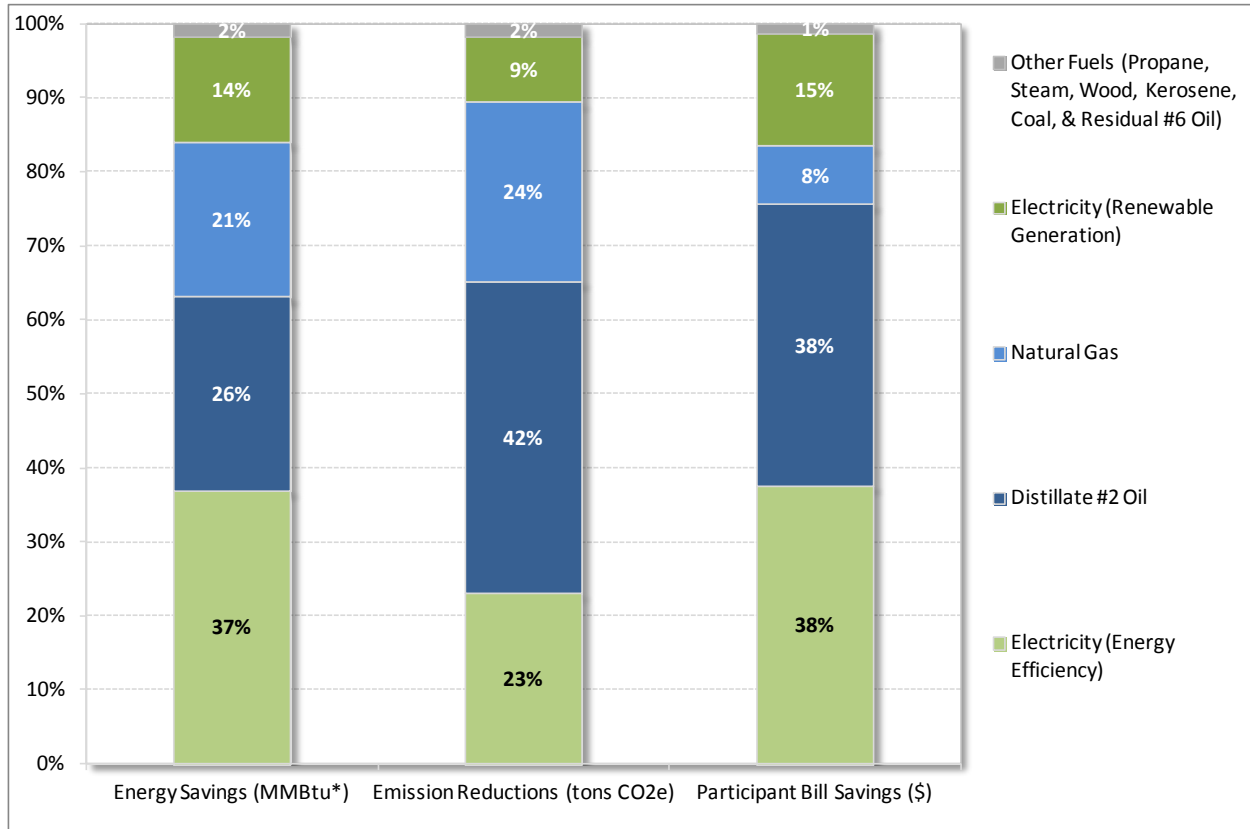
| Program | Costs (millions of dollars) | | Net Energy Savings (Annualized MMBtu) | | | | | Net Electricity Savings or Renewable Energy Generation (Annualized MWh) | | | | | Net Greenhouse Gas Emission Savings ^a (Annualized Tons CO ₂ e ^b) | | | | |
|--|----------------------------------|---|--|----------------------------------|--|----------------------------------|--|--|----------------------------------|--|--------------------------------|--|--|----------------------------------|--|---|---|
| | Total Incentives ^c | Total Associated Costs ^d | Installed Savings ^e | Pipeline Savings ^f | Total Committed Savings ^g | \$/MMBtu Savings ^h | \$/MMBtu EXPECTED LIFETIME Savings ⁱ | Installed Savings ^e | Pipeline Savings ^f | Total Committed Savings ^g | \$/MWh Savings ^h | \$/MWh EXPECTED LIFETIME Savings ⁱ | Installed Savings ^e | Pipeline Savings ^f | Total Committed Savings ^g | \$/Ton CO ₂ e Savings ^h | \$/Ton CO ₂ e EXPECTED LIFETIME Savings ⁱ |
| Green Jobs - Green New York | | | | | | | | | | | | | | | | | |
| GJGNY - Single-Family Residential Audit Component ^l | \$18.7 | \$1.0 | 588,706 | 321,312 | 910,018 | 22 | 1 | 7,246 | 3,923 | 11,169 | 1,761 | 98 | 44,753 | 24,417 | 69,169 | 284 | 12 |
| GJGNY - Single-Family Residential Loan Component ^l | \$26.9 | \$5.4 | 315,343 | 34,466 | 349,809 | 92 | 4 | 4,490 | 794 | 5,284 | 6,113 | 322 | 24,253 | 2,746 | 26,998 | 1,197 | 53 |
| GJGNY - Multifamily Residential Audit Component ^l | \$3.5 | \$1.4 | 530,084 | 118,808 | 648,892 | 8 | 0.5 | 33,582 | 7,527 | 41,109 | 119 | 9 | 44,628 | 10,003 | 54,631 | 89 | 6 |
| GJGNY - Small Commercial Loan Component | \$0.3 | \$0.2 | 3,640 | - | 3,640 | 131 | 6 | 434 | - | 434 | 1,102 | 85 | 351 | - | 351 | 1,362 | 76 |
| Energy Efficiency | | | | | | | | | | | | | | | | | |
| LIPA Photovoltaic and Efficiency Initiative | \$62.5 | - | - | - | - | - | - | 90,369 | 59,243 | 149,611 | 418 | 22 | 28,240 | 18,513 | 46,754 | 1,336 | 70 |
| Multifamily Performance Program | \$15.3 | \$2.0 | 226,503 | 316,625 | 543,127 | 32 | 2 | 4,163 | 5,700 | 9,863 | 1,757 | 137 | 19,174 | 26,765 | 45,939 | 377 | 25 |
| Multifamily Carbon Emissions Reduction Program ^k | \$6.1 | \$0.2 | - | - | - | - | - | - | - | - | - | - | 21,793 | 2,976 | 24,770 | 253 | 19 |
| EmPower New York | \$11.0 | \$0.9 | 57,417 | 60,150 | 117,568 | 101 | 4 | - | - | - | - | - | 4,419 | 4,701 | 9,119 | 1,303 | 54 |
| Home Performance with ENERGY STAR [®] | \$12.4 | \$1.3 | 196,146 | 14,726 | 210,872 | 65 | 3 | 1,030 | 88 | 1,118 | 12,269 | 682 | 16,272 | 1,192 | 17,464 | 786 | 33 |
| Green Residential Building Program | \$2.5 | \$0.3 | 36,548 | - | 36,548 | 75 | 3 | 1,573 | - | 1,573 | 1,748 | 97 | 2,663 | - | 2,663 | 1,032 | 45 |
| Solar Thermal Incentive Program | \$1.1 | \$0.1 | 3,391 | - | 3,391 | 347 | 17 | - | 25 | 25 | 47,957 | 47,957 | 248 | 8 | 256 | 4,600 | 237 |
| Low-Rise Residential New Construction Program | \$0.7 | - | 4,214 | 6,146 | 10,360 | 66 | 3 | 192 | 388 | 580 | 1,171 | 65 | 348 | 481 | 830 | 818 | 36 |
| Renewable Energy | | | | | | | | | | | | | | | | | |
| Renewable Heat New York | \$0.001 | \$0.7 | 200 | - | 200 | 3,389 | 169 | 22 | - | 22 | 31,106 | 1,555 | 19 | - | 19 | 35,509 | 1,775 |
| NY-Sun Initiative | \$33.9 | \$0.01 | - | - | - | - | - | 19,293 | 17,036 | 36,330 | 934 | - | 6,029 | 5,324 | 11,353 | 2,990 | 120 |
| NYSERDA Solar Electric | \$5.2 | \$0.1 | - | - | - | - | - | 2,049 | 39 | 2,088 | 2,548 | 102 | 640 | 12 | 652 | 8,154 | 326 |
| Community Clean Energy | | | | | | | | | | | | | | | | | |
| Regional Economic Development & GHG Reduction | \$0.8 | - | - | 5,812 | 5,812 | 145 | 8 | - | 3,687 | 3,687 | 229 | - | - | 1,542 | 1,542 | 547 | 30 |
| Cross-Program Overlap ^l | N/A | N/A | -458,292 | -193,447 | -651,740 | N/A | N/A | -4,949 | -1,948 | -6,897 | N/A | N/A | -35,783 | -15,562 | -51,345 | N/A | N/A |
| TOTAL Annualized Cumulative Benefits | \$200.9 | \$13.5 | 1,503,898 | 684,598 | 2,188,496 | 98 | N/A | 159,495 | 96,501 | 255,996 | 837 | N/A | 178,048 | 83,118 | 261,165 | 821 | N/A |
| TOTAL Expected Lifetime Cumulative Benefits | \$200.9 | \$13.5 | 29,804,674 | 13,174,393 | 42,979,067 | N/A | 5 | 2,996,634 | 1,791,975 | 4,788,609 | N/A | 45 | 3,345,870 | 1,556,356 | 4,902,226 | N/A | 44 |

Table notes are on the next page

Table 2 continued

- ^a These emission reductions are associated with both electric and fossil-fuel saving measures. Under a cap-and-trade system, the total number of emission allowances is determined by regulation. Regulated entities can purchase allowances and collectively emit up to the cap that is currently in place. Therefore, in the near term, electric efficiency projects may not decrease the overall amount of emissions going into the atmosphere. However, electric efficiency projects will reduce end users' responsibility or footprint associated with emissions from electricity production.
- ^b CO₂e stands for carbon dioxide equivalent and describes the amount of CO₂ that would have the same global warming potential as a given mixture of gases based on factors published by the Intergovernmental Panel on Climate Change.
- ^c Inclusive of incentive dollars for expenditures, encumbrances, and contract pre-encumbrances.
- ^d Inclusive of all non-incentive expenditures.
- ^e Inclusive of savings from all currently operational projects installed since program inception.
- ^f Inclusive of savings from all projects under a signed contract and projects with an application received that are not yet operational.
- ^g The sum of Installed Savings and Pipeline Savings.
- ^h The sum of Total Incentives and Total Associated Costs divided by Total Committed Savings.
- ⁱ The sum of Total Incentives and Total Associated Costs divided by the Expected Lifetime Total Committed Savings. Inclusive of cross-program overlap.
- ^j The benefits for this program include some projects that have also been supported by other non-RGGI NYSERDA funding sources.
- ^k The Multifamily Carbon Emissions Reduction Program is a fuel-switching program and does not claim any energy or bill savings.
- ^l Cross-program overlap accounts for projects that received any combination of a GJGNY assessment, a GJGNY loan, or a RGGI-funded incentive through the Home Performance with ENERGY STAR[®] Program.

Figure 1. Percent Contribution by Fuel Type for Energy Savings, Emission Reductions, and Bill Savings through December 31, 2014



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

3 Funds

3.1 Proceeds

As of December 31, 2014, New York State sold more than 273.1 million CO₂ allowances and received more than \$728.2 million in auction proceeds. In addition, more than \$5.9 million in interest was earned on the RGGI portfolio and nearly \$1.8 million in interest was earned on the Green Jobs - Green New York (GJGNY) program. More than \$4.4 million in interest earnings were allocated on the RGGI portfolio and nearly \$0.8 million in interest earnings were allocated on the Green Jobs - Green New York (GJGNY) program. The allocated interest earnings are re-invested for program implementation and are distributed across various RGGI programs. Detailed auction proceeds and total funds for NYS RGGI are presented in Appendix D and Appendix E, respectively. Total NYS RGGI funds are listed in Table 3, and detailed auction proceeds for NYS RGGI are visually displayed in Figure 2.

Table 3. New York State's RGGI Auction Results and Funds through December 31, 2014^a

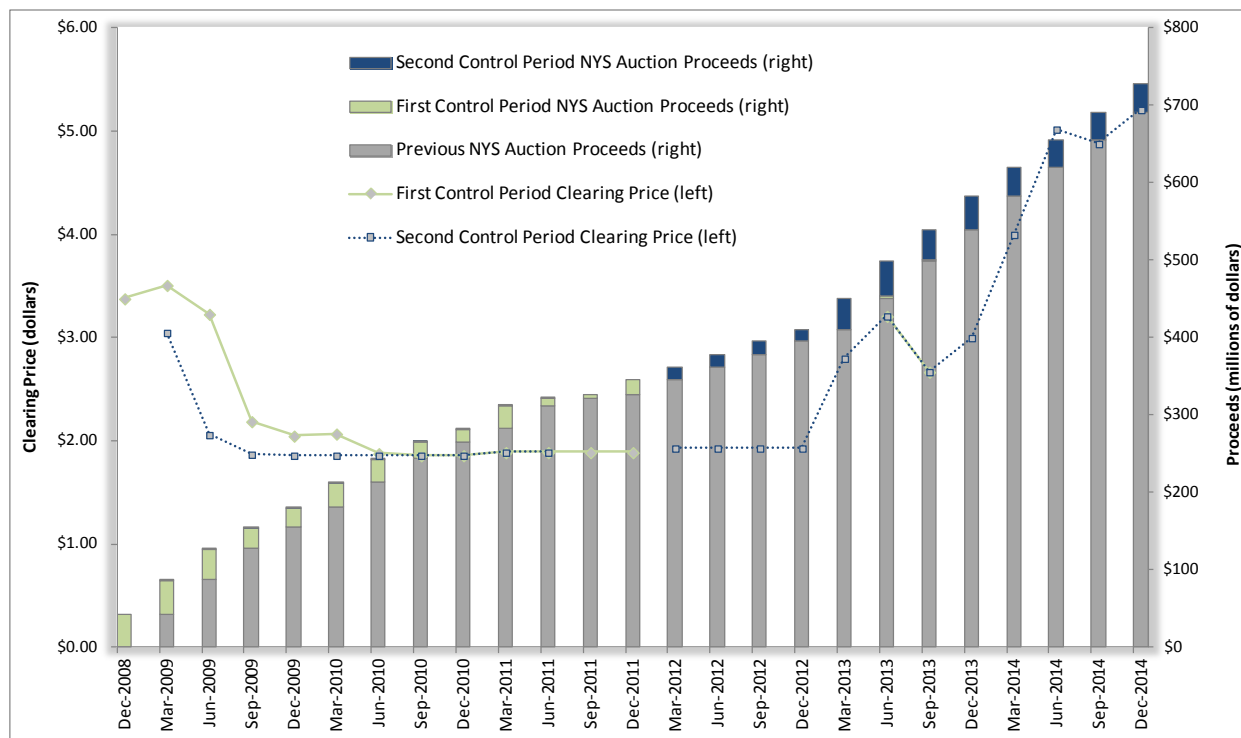
Source: RGGI, Inc. and NYSERDA

| Fund Category | NYS Allowances Sold | Cumulative Funds |
|----------------------------------|----------------------------|-------------------------|
| First Control Period Total | 144,305,904 | 336,282,535 |
| Second Control Period Total | 128,764,643 | 391,950,232 |
| RGGI Auction Proceeds | 273,070,547 | 728,232,767 |
| RGGI Portfolio Interest Earnings | | \$5,914,666 |
| GJGNY Program Interest Earnings | | \$1,779,747 |
| TOTAL Funds | | \$735,927,180 |

^a The first control period for fossil-fuel-fired electric generators took effect on January 1, 2009, and concluded on December 31, 2011. The second control period took effect on January 1, 2012, and extends through December 31, 2014.

Figure 2. New York State’s RGGI Auction Results through December 31, 2014

Source: RGGI, Inc.



3.2 Budget

Financial data for the approved RGGI programs through December 31, 2014, are presented in Table 4 through Table 6. Table 4 presents the current expended, encumbered, and committed funds for each program and reflects how \$735.9 million of current funds are distributed across Other Costs and the six major program areas:

- Renewable Energy.
- Energy Efficiency.
- Innovation GHG Abatement Strategies.
- Community Clean Energy.
- Green Jobs – Green New York.
- NY Green Bank.

Table 5 and Table 6 present the financial data for the approved GJGNY program and NY Green Bank, respectively, through December 31, 2014.

Table 4. Available Funding and Financial Status through December 31, 2014 (millions of dollars)

Source: NYSERDA

| | Budgeted Funds ^a | Expended Funds ^b | Open Encumbrances ^c | Pre-Encumbrances ^d | Committed Funds ^e | Remaining Balance ^f |
|---|-----------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------|--------------------------------|
| Renewable Energy | | | | | | |
| Renewable Heat NY | 3.4 | 0.1 | 0.5 | 2.8 | 3.4 | - |
| NY-Sun | 48.9 | 7.9 | 6.3 | 19.8 | 33.9 | 15.0 |
| NYSERDA Solar Electric Programs | 5.3 | 5.3 | 0.03 | - | 5.3 | - |
| NY Generation Attribute Tracking | 1.4 | - | - | - | - | 1.4 |
| Advanced Renewable Energy | 2.9 | 2.8 | 0.02 | - | 2.8 | 0.1 |
| Total Renewable Energy | 62.0 | 16.1 | 6.8 | 22.6 | 45.5 | 16.5 |
| Energy Efficiency | | | | | | |
| LIPA Photovoltaic and Efficiency Initiative | 62.5 | 45.2 | - | 17.3 | 62.5 | - |
| Residential Efficiency Services | 63.6 | 38.1 | 7.6 | 8.1 | 53.8 | 9.7 |
| Municipal Water and Wastewater | 1.2 | 1.2 | - | - | 1.2 | - |
| Total Energy Efficiency | 127.3 | 84.5 | 7.6 | 25.4 | 117.5 | 9.7 |
| Innovative GHG Abatement Strategies | | | | | | |
| Industrial Innovations | 13.8 | 3.5 | 7.8 | 2.5 | 13.8 | - |
| Climate Research and Analysis | 10.0 | 4.2 | 1.6 | 1.5 | 7.3 | 2.7 |
| Clean Energy Business Development | 21.5 | 7.1 | 3.1 | 9.5 | 19.7 | 1.8 |
| Charge NY | 3.0 | - | - | - | - | 3.0 |
| Transportation Research | 3.9 | 1.8 | 0.03 | 1.0 | 2.8 | 1.1 |
| Carbon Capture and Sequestration | 1.0 | 1.0 | - | - | 1.0 | - |
| Advanced Buildings | 4.6 | 0.9 | 0.8 | 2.9 | 4.6 | - |
| Competitive Greenhouse Gas Reduction Pilot | 14.5 | - | - | 14.5 | 14.5 | - |
| Total Innovative GHG Abatement Strategies | 72.4 | 18.4 | 13.4 | 32.0 | 63.8 | 8.6 |
| Community Clean Energy | | | | | | |
| Climate Smart Communities | 5.6 | 2.7 | 1.3 | 0.4 | 4.4 | 1.2 |
| Economic Development Growth Extension | 6.6 | 3.2 | 1.0 | - | 4.2 | 2.3 |
| Cleaner, Greener Communities | 99.4 | 11.9 | 13.8 | 47.1 | 72.8 | 26.6 |
| Regional Economic Development and Greenhouse Gas Reductions | 10.4 | 5.4 | 4.9 | - | 10.3 | 0.1 |
| Total Community Clean Energy | 122.0 | 23.2 | 21.0 | 47.5 | 91.7 | 30.2 |
| Other Costs^g | | | | | | |
| Deficit Reduction Plan (DRP) Transfer ^h | 90.0 | 90.0 | - | - | 90.0 | - |
| Con Edison Smart Grid Program ⁱ | 18.2 | 18.2 | - | - | 18.2 | - |
| Program Administration ^j | 35.8 | 13.6 | 0.001 | - | 13.6 | 22.2 |
| Metrics and Evaluation | 17.1 | 2.0 | 2.9 | 0.7 | 5.7 | 11.4 |
| RGGI Inc. Costs ^k | 7.4 | 5.5 | 0.5 | 0.03 | 6.0 | 1.4 |
| New York State Cost Recovery Fee | 11.8 | 4.0 | - | - | 4.0 | 7.7 |
| Surplus | 3.9 | - | - | - | - | 3.9 |
| Unallocated Interest Earnings | 1.5 | - | - | - | - | 1.5 |
| OTHER COSTS TOTAL | 185.6 | 133.3 | 3.4 | 0.8 | 137.5 | 48.1 |
| SUBTOTAL | 569.2 | 275.6 | 52.2 | 128.3 | 456.0 | 113.2 |
| Green Jobs - Green New York | | | | | | |
| Green Jobs - Green New York | 113.8 | 79.6 | 13.7 | 5.3 | 98.7 | 15.1 |
| NY Green Bank | | | | | | |
| NY Green Bank | 52.9 | 1.4 | - | - | 1.4 | 51.6 |
| TOTAL^l | 735.9 | 356.5 | 65.9 | 133.6 | 556.1 | 179.8 |

Table notes are on the next page

Table 4 continued

- a Includes auction proceeds and allocated interest on the RGGI and GJGNY portfolios. The allocation is consistent with the three-year budget presented in the Operating Plan.
- b Invoices processed for payment by NYSERDA.
- c Remaining funding obligated under a contract, purchase order, or incentive award.
- d Planned funding for contracts awarded and under negotiation; and planned funding under active development through open solicitations with upcoming proposal due dates, adjusted so that the sum of the project commitments does not exceed Budgeted Funds. NYSERDA's annual audited financial statements may reflect project commitments in excess of Budgeted Funds. These commitments are expected to decrease over time due to project attrition and differences in estimated versus actual costs.
- e The sum of Expended, Encumbered, and Pre-Encumbered funds.
- f The difference between Budgeted Funds and Committed Funds.
- g The values for Program Administration, Metrics and Evaluation, and the New York State Cost Recovery Fee represent aggregate funds and commitments for RGGI-funded activities, NOT including GJGNY. For information on GJGNY finances, refer to Table 5.
- h 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 following the global financial crisis.
- i On December 22, 2009, NYSERDA's Board approved a proposed consent decree that resolves the legal challenge to the State's RGGI program. In October 2010, State Supreme Court Judge Thomas J. McNamara signed a Stipulation and Order of Discontinuance signed by all the parties, thereby formally ending the litigation. The parties to the consent decree presently estimate that the total commensurate benefit for the calendar years 2009-2017 is \$18.9 million and agreed to dedicate such funds for the development of smart grid technologies in the Con Edison territory. The budget reflects allocations that are intended to fund NYSERDA's estimated liability for each calendar year control period consistent with the timing of estimated cash payments due to Con Edison. NYSERDA is also responsible for certain additional costs that may be incurred through 2017. NYSERDA's annual audited financial statements show an amount expended of \$18.9 million to reflect these additional estimated costs that were required to be recorded.
- j Includes NYSERDA's upfront administrative expenses related to the development and implementation of the CO₂ Budget Trading Program, the CO₂ Allowance Auction program, and the Operating Plan.
- k The first-year budget includes RGGI Inc. start-up costs and New York State's share of ongoing RGGI Inc. expenses. RGGI Inc. is a nonprofit corporation created to support development and implementation of the CO₂ Budget Trading Program.
- l Totals may not sum exactly due to rounding.

Table 5. Green Jobs - Green New York Available Funding and Financial Status through December 31, 2014 (millions of dollars)

| | Budgeted Funds ^a | Expended Funds ^b | Open Encumbrances ^c | Pre-Encumbrances ^d | Committed Funds ^e | Remaining Balance ^f |
|--|-----------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------|--------------------------------|
| Workforce Development, Outreach and Marketing | | | | | | |
| Workforce Development | 8.0 | 5.3 | 1.6 | 0.2 | 7.0 | 1.0 |
| Outreach and Marketing | 15.5 | 10.3 | 2.7 | 1.0 | 14.0 | 1.5 |
| Total Workforce Development, Outreach and Marketing | 23.5 | 15.6 | 4.3 | 1.2 | 21.1 | 2.4 |
| Residential | | | | | | |
| Energy Assessment Incentive | 19.4 | 16.4 | - | 2.3 | 18.7 | 0.7 |
| Implementation Costs | 1.0 | 1.0 | 0.05 | - | 1.0 | - |
| Financing: Loans | 26.7 | 70.3 | - | 1.8 | 72.1 | |
| Financing: Loan Repayments | - | (7.9) | - | - | (7.9) | |
| Financing: Implementation Costs | - | 4.3 | 0.4 | - | 4.7 | |
| Financing: Bond Proceeds | - | (24.3) | - | - | (24.3) | |
| Financing: Bond Issue Costs | - | 1.1 | - | - | 1.1 | |
| Financing: Short Term Note | - | (19.1) | - | - | (19.1) | |
| Total Financing | 26.7 | 24.4 | 0.4 | 1.8 | 26.7 | - |
| Total Residential | 47.0 | 41.8 | 0.5 | 4.1 | 46.4 | 0.7 |
| Multifamily | | | | | | |
| Energy Assessments | 3.8 | 2.2 | 1.3 | - | 3.5 | 0.3 |
| Implementation Costs | 1.6 | 1.4 | 0.0004 | - | 1.4 | 0.2 |
| Financing: Loans | 7.0 | 3.3 | - | 0.03 | 3.3 | |
| Financing: Loan Repayments | - | (0.7) | - | - | (0.7) | |
| Financing: Implementation Costs | 0.3 | 0.1 | 0.2 | - | 0.3 | |
| Total Financing | 7.3 | 2.7 | 0.2 | 0.03 | 2.9 | 4.4 |
| Total Multifamily | 12.7 | 6.3 | 1.5 | 0.03 | 7.8 | 4.9 |
| Small Commercial | | | | | | |
| Energy Assessments | 8.7 | 4.0 | 4.6 | - | 8.6 | 0.1 |
| Implementation Costs | 2.3 | 0.5 | 0.6 | 0.02 | 1.1 | 1.2 |
| Financing: Loans | 2.9 | 0.3 | - | - | 0.3 | |
| Financing: Loan Repayments | - | (0.1) | - | - | (0.1) | |
| Financing: Implementation Costs | 0.3 | 0.2 | 0.3 | - | 0.5 | |
| Total Financing | 3.2 | 0.5 | 0.3 | - | 0.8 | 2.4 |
| Total Small Commercial^g | 14.2 | 5.0 | 5.5 | 0.0 | 10.5 | 3.7 |
| SUBTOTAL | 97.4 | 68.7 | 11.7 | 5.3 | 85.7 | 2.6 |
| Other Costs | | | | | | |
| Program Administration | 7.8 | 7.3 | 0.0003 | - | 7.3 | 0.6 |
| Program Evaluation | 5.6 | 2.2 | 2.0 | - | 4.2 | 1.4 |
| New York State Cost Recovery Fee | 1.9 | 1.4 | - | - | 1.4 | 0.5 |
| Unallocated Interest Earnings | 1.0 | - | - | - | - | 1.0 |
| OTHER COSTS TOTAL | 15.3 | 10.9 | 2.0 | - | 13.0 | 2.4 |
| TOTAL^h | 113.8 | 79.6 | 13.7 | 5.3 | 98.7 | 5.0 |

Table notes are on the next page

Table 5 continued

- ^a Includes auction proceeds and allocated interest on the Green Jobs - Green New York (GJGNY) funds. The allocation is consistent with the three-year budget presented in the 2013 RGGI Operating Plan.
- ^b Invoices processed for payment by NYSERDA.
- ^c Remaining funding obligated under a contract, purchase order, or incentive award.
- ^d Planned funding for contracts awarded and under negotiation; and planned funding under active development through open solicitations with upcoming proposal due dates, adjusted so that the sum of the project commitments does not exceed Budgeted Funds. NYSERDA's annual audited financial statements may reflect project commitments in excess of Budgeted Funds. These commitments are expected to decrease over time due to project attrition and differences in estimated versus actual costs.
- ^e The sum of Expended, Encumbered, and Pre-Encumbered funds.
- ^f The difference between Budgeted Funds and Committed Funds.
- ^g Actual Pre-Encumbrances towards the Solicitation for the contracting of implementation, quality assurance, and energy assessments contractors total \$7.0 million. The total Pre-Encumbrances for the Small Commercial program presented in this table reflects additional funding from sources that include new funds, transfers, and funds disencumbered from current energy assessment contracts.
- ^h Totals may not sum exactly due to rounding.

**Table 6. NY Green Bank Available Funding and Financial Status through December 31, 2014
(millions of dollars)**

| | Budgeted Funds ^a | Expended Funds ^b | Open Encumbrances ^c | Pre-Encumbrances ^d | Committed Funds ^e | Remaining Balance ^f |
|----------------------------------|-----------------------------|-----------------------------|--------------------------------|-------------------------------|------------------------------|--------------------------------|
| Program Costs | | | | | | |
| NY Green Bank | 48.6 | - | - | - | - | 48.6 |
| SUBTOTAL | 48.6 | - | - | - | - | 48.6 |
| Other Costs | | | | | | |
| Program Administration | 4.2 | 1.3 | - | - | 1.3 | 2.9 |
| Program Evaluation | - | - | - | - | - | - |
| New York State Cost Recovery Fee | 0.1 | 0.03 | - | - | 0.03 | 0.1 |
| OTHER COSTS TOTAL | 4.4 | 1.4 | - | - | 1.4 | 3.0 |
| TOTAL^g | 52.9 | 1.4 | - | - | 1.4 | 51.6 |

^a Includes auction proceeds on NY Green Bank funds. The allocation is consistent with the three-year budget presented in the RGGI Operating Plan. NY Green Bank funding being reported here is only NY Green Bank funds that were transferred from RGGI. The actual NY Green Bank budget is higher.

^b Invoices processed for payment by NYSERDA.

^c Remaining funding obligated under a contract, purchase order, or incentive award.

^d Planned funding for contracts awarded and under negotiation; and planned funding under active development through open solicitations with upcoming proposal due dates, adjusted so that the sum of the project commitments does not exceed Budgeted Funds. NYSERDA's annual audited financial statements may reflect project commitments in excess of Budgeted Funds. These commitments are expected to decrease over time due to project attrition and differences in estimated versus actual costs.

^e The sum of Expended, Encumbered, and Pre-Encumbered funds.

^f The difference between Budgeted Funds and Committed Funds.

^g Totals may not sum exactly due to rounding.

As stated in the Operating Plan, geographic equity of expenditures is pursued across the RGGI portfolio of programs. Figure 3 shows the distribution of \$164.8 million in RGGI funds that have been spent on 38,327 projects installed in New York State as of December 31, 2014. Additional RGGI funds go toward activities with geographically diffuse benefits, such as climate research and workforce development.

4 Program Descriptions and Accomplishments

4.1 Renewable Energy

4.1.1 Renewable Heat NY

The Renewable Heat NY initiative is a long-term commitment to help the high efficiency, low-emission biomass heating industry reach scale. The long-term market development strategy for Renewable Heat NY includes the following objectives:

- Raise consumer awareness.
- Develop large-scale anchor customers to expand the wood pellet bulk delivery market.
- Promote supply chain development including workforce training and support for product development, manufacturing, laboratory and field testing, and equipment certification.
- Leverage NYSERDA's issuance of the Biomass Heating Roadmap to accelerate the use of biomass for heating using the most efficient low-emission technologies.
- Provide financial incentives to consumers for advanced efficiency and low-emission technologies to reduce upfront costs in the early years, which will phase down as the market achieves scale and upfront costs decrease.
- Provide support so that sustainable forestry practices are available and followed by small and large landowners.

In many key respects, developing this market will inherently require capturing the benefits of scale, and particularly of local sale. Installation and pellet supply economics will demonstrate an economic service radius effect; workforce development and customer awareness will show gains from local density.

Consequently, this initiative seeks to develop and expand clusters of activity, thereby meeting the overarching goal of helping the high-efficiency and low-emission biomass heating industry reach scale.

Renewable Heat NY is providing supply chain and service network development (i.e., workforce development, training, and research and development), along with consumer incentives and financing. These activities are not geared toward resource acquisition, but rather will position the market to takeoff and be sustainable over the long term. As the program metrics indicate success, investments of incentives and staff resources will be reduced as the private market develops.

Key accomplishments during this quarter:

- Marketing efforts to inform customers include direct mail, website postings, print advertisements in local and regional publications and coordinated activities with industry and academic organizations. Training for qualifying installers continues; the next event is scheduled for February 19. Enrollment of qualified installers is ongoing.
- The list of qualified technologies available for installation under RHHY includes 32 pellet boilers from seven manufacturers; 58 pellet stoves and 17 stove inserts from 15 manufacturers. Seven pellet stove projects are complete, and 129 customers have active reservations. Three pellet boiler and two cordwood boiler projects are under development for residential customers. Feasibility studies and reviews by technical consultants are ongoing in the development of large commercial projects expected to begin contracting in the next quarter.

4.1.2 NY-Sun Initiative

The NY-Sun Initiative will drive growth of the solar industry and make solar technology more affordable for all New Yorkers. The program provides incentives for the installation of systems and works to reduce solar electric balance-of-system costs through technology advancements, streamlined processes and customer aggregation models. The RGGI-funded NYSERDA Solar Electric Program and LIPA Photovoltaic and Efficiency Initiative have both transitioned into the NY-Sun Initiative.

Community Solar NY, a component of the NY-Sun Initiative, seeks to empower community projects across New York State through aggregation, group purchasing, and other existing and emerging strategies to make solar more accessible and affordable. The program will support projects organized by school districts, municipalities, nonprofit organizations, and other community institutions. In coordination with the New York Power Authority and the New York State Education Department, K-Solar will offer targeted resources to help schools implement solar and act as hubs for community projects.

Key accomplishments during this quarter:

- Launch of Community Solar NY Solarize campaigns launched in April 2015. Community Solar NY is supporting more than 25 local solar aggregation campaigns through this program round.
- Statewide outreach to potential Community Solar NY Round 1 applicants in collaboration with NYSERDA outreach programs and partners.
- Continued coordination with New York Power Authority, the New York State Education Department and other K-Solar partners to encourage participation of schools in local community solar outreach projects.
- A total of 2,006 solar electric systems have been installed through December 31, 2014 on Long Island through PON 2112 and the Solar Pioneer Programs.
- One solar electric system has been completed in a municipal power territory.

Success Story 1: New York RGGI Proceeds Help Drive Private Investment in Solar Development

RGGI proceeds are bringing private investment into solar development on Long Island. More than 3,500 homes and 40 nonresidential properties mark the beginning of solar energy projects in the area due to RGGI support through the NY-Sun initiative. When the projects are completed, they will produce close to 32 megawatts of electricity. A little more than \$11 million in RGGI proceeds has helped leverage \$125 million in private investment to fund these projects. Long Island has a strong history with solar; it has installed approximately 41 percent of all the solar projects in New York State, adding clean, renewable solar energy and greatly reducing carbon emissions.

4.1.3 NYSERDA Solar Electric Programs

NYSERDA's NY-Sun Incentive Program focuses on reducing GHG emissions in the long term by helping to establish a sustainable market for solar energy throughout New York State that includes targeted financial incentives. The NY-Sun Program has grown out of NYSERDA's existing solar electric (photovoltaic or PV) programs. In August 2014, NY-Sun became a statewide program, whereby customers of LIPA, NYPA, and municipal power companies became eligible participants. NY-Sun supports end-use solar installations for commercial, industrial, and residential customers as well as electric utility applications to improve the performance of distribution circuits and reduce peak electric load in critical load pockets. These projects assist New York State communities that empower clean energy, healthy communities and empower economic development. These funds supplement and do not supplant Renewable Portfolio Standard (RPS) funds, particularly in regions that do not pay into the RPS.

Key accomplishments during this quarter:

- A total of 128 solar electric systems have been installed using RGGI funding from the inception of the NYSERDA solar electric program through December 31, 2014.

4.1.4 New York Generation Attribute Tracking (NYGATS)

NYSERDA is establishing NYGATS to record electricity generation attribute information within New York State, and processes generation attribute information from energy imported and consumed within the state, as a basis for creating tradable generation attribute certificates. Through the development of NYGATS, entities will be able to verify and substantiate ownership of Renewable Energy Certificates (RECs) to either support regulatory compliance or to validate environmental attributes in trading markets. It will also characterize the attributes of electricity imports and exports, and have the capability to interface and exchange information with other certificate tracking systems. The system may also serve as an important building block for a potential future imports policy under the Regional Greenhouse Gas Initiative. As previously ordered by the Public Service Commission, this project will also be supported with System Benefits Charge (SBC) environmental disclosure program funding.

Key accomplishments during this quarter:

- Approval was received to use RGGI and uncommitted SBC funds to design, build, implement, operate, maintain, and administer a generation attribute tracking system for New York State.
- In the first quarter of 2015, NYSERDA released RFP 3014 to competitively select a qualified contractor to design, install/test, operate and maintain NYGATS for a period of five years.

4.1.5 Advanced Renewable Energy Program

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

Key accomplishments during this quarter:

- The Research Foundation for the State University of New York in Binghamton has developed a novel, silicon-based thin film thermoelectric material that shows promise for enabling waste heat-based energy scavenging with thermoelectric figures of merit greater than two. A final report was completed in November, 2014. NYSERDA and SUNY Binghamton will finalize the project and review next steps in Q1 2015.
- Monolith Solar (Rensselaer, NY) began a project based on demonstrating mounting mechanisms on different roof types.
- Membership agreements with Atlas Material Testing Technology (Illinois) and Intertek (New York and California) are underway and expected to be finalized in 2015. Both companies will support the Indoor Accelerated Lifetime Testing (IALT) project.

4.2 Energy Efficiency

4.2.1 LIPA Photovoltaic and Efficiency Initiative

These funds enhance the ability of the Long Island Power Authority (LIPA) to provide energy efficiency and renewable energy services to LIPA customers in accordance with the approved LIPA budget. As the LIPA Solar Pioneer and Solar Entrepreneur PV incentive programs transition to a statewide solar electric program through NY-Sun, these RGGI funds will be used primarily for energy efficiency programs administered by PSEG Long Island that are consistent with PSEG-Long Island's clean energy programs and Reforming the Energy Vision (REV) plan. Funding and reporting requirements are established through a Memorandum of Understanding between NYSERDA, LIPA, and PSEG Long Island.

Key accomplishments during this quarter:

- A total of 2,618 solar electric systems and 1,935 commercial efficiency projects have been installed using RGGI funding through the LIPA Photovoltaic and Efficiency Initiative programs from inception through December 31, 2014.

4.2.2 Residential Efficiency Service

NYSERDA currently offers a suite of programs that provide comprehensive energy 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. RGGI funds are used in combination with Energy Efficiency Portfolio Standard (EEPS) funds, which offer incentives to implement electric and gas efficiency measures, to supplement these resources to reach petroleum fuel opportunities as well as renewable energy opportunities. Coordination of these funding sources allows for efficiency contractors to provide comprehensive energy efficiency services to the home, expands the number of households served, and ensures that opportunities for carbon reduction measures are not lost.

4.2.2.1 Multifamily Performance Program

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

Key accomplishments during this quarter:

- Through December 31, 2014, the total number of energy efficiency projects completed through the MPP program is 56.

4.2.2.2 Multifamily Carbon Emission Reduction Program

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

Key accomplishments during this quarter:

- In total, 134 multifamily buildings have converted through MCERP from burning #6 oil to cleaner alternatives, primarily natural gas or a blend of natural gas and #2 oil.

4.2.2.3 EmPower New York

NYSERDA's EmPower New York (EmPower) program offers no-cost energy efficiency services to low-income (i.e., HEAP-eligible) homeowners and renters. These services include electric reduction and home performance measures such as appliance replacement, energy-efficient lighting, insulation and air-sealing. EmPower uses RGGI funding to serve low-income applicants that heat with oil and propane and are ineligible for EEPS funding. These energy efficiency measures aid in the reduction of GHG emissions and provide long-term carbon reductions. On-site energy education offers customers additional strategies for managing their energy costs. Services are provided by participating contractors that are accredited through the Building Performance Institute. Currently, 177 EmPower contractors are assisting in RGGI-funded projects.

Key accomplishments during this quarter:

- 142 households across New York State were served during this quarter, bringing the total to 2,134 households served under EmPower New York through December 31, 2014 with RGGI funding.

4.2.2.4 Home Performance with ENERGY STAR[®] (HPwES)

Home Performance with ENERGY STAR (HPwES) is a comprehensive energy efficiency services program for existing one- to four-family homes and low-rise² residential buildings. The program uses a network Building Performance Institute (BPI) GoldStar contractors to perform diagnostic testing on the home, recommend improvements, determine the payback period for those improvements, and install improvements selected by the homeowner. Currently, more than 200 contractors are participating in HPwES. The program uses RGGI funds for cost-effective oil and propane efficiency measures, such as replacing inefficient oil and propane heating equipment and other measures that have a direct impact on reducing GHG emissions from oil and propane consumption. Income-qualified homeowners are eligible for higher incentive rates to make energy improvements. HPwES applicants may also qualify for GJGNY assessment and financing programs.

Key accomplishments during this quarter:

- 578 energy efficiency projects were completed during this quarter at a contracted value of \$5.7 million, bringing the total to 5,502 energy efficiency projects completed at a contracted value of \$52.2 million.
- 31 percent of RGGI-funded HPwES projects this quarter were eligible for Assisted Home Performance with ENERGY STAR.
- 31% of all HPwES projects in 2014 were RGGI-funded.

² HPwES low-rise buildings encompass buildings with three stories or less, with eight units or less, and are constructed using building techniques common to one- to four-family homes. They must be served by residential-scale heating equipment with a maximum rating of 300,000 Btu. Taller residential buildings that fit these criteria are also eligible. Examples include brownstones, row housing, and other urban-style buildings.

4.2.2.5 Solar Thermal Incentive Program

NYSERDA's Solar Thermal Incentive Program incentivizes the installation of solar thermal technologies for the production of hot water that displaces electrically heated hot water systems. System incentives are capped at \$4,000 per site/meter for residential systems and \$25,000 per site/meter for nonresidential applicants. In this program, nearly 100 contractors participate. Accounting for funding from the Renewable Portfolio Standard (RPS) program to displace electrically heated domestic hot water, RGGI support for the Solar Thermal Incentive Program is used to displace heating fuels other than electricity. GJGNY financing is also available for these projects.

Key accomplishments during this quarter:

- Six new RGGI-funded solar thermal hot water systems were installed during this quarter, bringing the total to 113 system installations.
- Program staff has reached out to key stakeholders to solicit input on a number of proposed program design changes, including incentive rates based on fuel type and an increased limit on the maximum per project incentive amount. The remaining balance of the additional funds, approximately \$3.1 million, will be used to fund future projects under the new program design.

4.2.2.6 Low-rise Residential New Construction Program

NYSERDA's Low-rise Residential New Construction Program³ (LRNCP) includes the New York ENERGY STAR[®] Certified Homes Program and the New York Energy Smart designation for certain low-rise, multi-unit buildings and gut rehabilitation projects. These programs are designed and intended to encourage the construction of new single-family homes and low-rise residential dwelling units that operate more energy efficiently and reduce long-term GHG emissions, are more durable, and provide a healthier environment for their occupants than would otherwise be achieved. Nine builders are participating in this program. Starting in July 2013, RGGI funds have been used to pay the MMBtu-savings component of the LRNCP incentive for projects using propane or oil as the primary heating fuel.

³ Low-rise residential new construction is defined as the ground-up new construction of dwelling unit(s) contained within residential buildings of not more than three (3) stories in height. Additionally, residential buildings which are more than three (3) stories in height and determined to be eligible to participate in the EPA's ENERGY STAR[®] Certified Homes program will be considered for eligibility on a case-by-case basis. Dwelling units which will be "gut-rehabbed" or fully rehabilitated will also be considered by NYSERDA for eligibility on a case-by-case basis.

Key accomplishments during this quarter:

- 3 new dwelling units were constructed, bringing the cumulative total of new dwelling units constructed to date to 106.
- \$15,642 in private sector funds were leveraged, bringing the program total to date to \$472,334.

4.2.3 Municipal Water and Wastewater Program

The purpose of the Municipal Water and Wastewater program is to reduce energy use through energy efficiency and process improvement measures. The program offers coordinated assistance designed to achieve cost-effective CO₂ reductions by providing technical support and implementation assistance to existing facilities and new construction projects.

4.2.3.1 Wastewater Energy Efficiency Program

The Wastewater Energy Efficiency Program (WWEP) provides a unique opportunity to coordinate RGGI climate change goals and funding with U.S. Environmental Protection Agency (EPA) goals as well as funding while installing infrastructure that will improve the environment and keep New York State waters clean and healthy. This program is co-managed by the New York State Environmental Facilities Corporation (EFC) and NYSERDA. EFC has secured Green Project Reserve Funds offered by EPA to bolster efforts to finance water and wastewater infrastructure via the Clean Water State Revolving Fund Program. Manufacturing plants financed with Green Project Reserve monies will be constructed energy efficiently, thus minimizing carbon emissions and improving their economic and environmental performance.

Selected projects receive RGGI-funded technical analysis to identify costs and savings associated with energy efficiency, process improvement, and carbon abatement opportunities, as well as Green Project Reserve grants to cost share plant upgrades. WWEP was selected as one of five national recipients of the States Stepping Forward Program Award for excellence by the American Council for an Energy-Efficient Economy.

Key accomplishments during this quarter:

- No new technical energy analyses were conducted during this quarter, keeping the total to 59 completed analyses.
- Projected annual savings are 46,546 MWh and 56,447 MMBtu, pending installation of currently recommended measures.

4.3 Innovative GHG Abatement Strategies

4.3.1 Industrial Innovations Program

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

In 2014, two Manufacturing Innovations solicitations were issued, namely, PON 2858 (Ultraviolet Light and Electron Beam Process Innovation and Market Transformation [UV/EB]) and PON 2927 (Transformative Technologies for Energy-Efficient Manufacturing [TTEEM]). These solicitations sought to advance the materials, methods, and machine tools used to mass-produce cleantech products, and thus reduce the GHG footprint of factories producing cleantech products, as well as reduce the cost of goods sold as cleantech products so that their adoption will further result in a decrease of GHG emissions.

In late 2013, NYSERDA issued a solicitation for Industrial Innovations under the Advanced Buildings program, the first of three rounds of this solicitation offering. PON 2846 (Innovations in Data Center, Information and Communications Technology Energy Efficiency) seeks proposals in three rounds for research, product development, and demonstration projects of energy efficiency innovations for data center and enterprise information and communications technology (ICT). The objective of this solicitation is to overcome barriers and speed the technical/market readiness of promising early-stage technologies and techniques that can improve energy efficiency in data centers and ICT used by NYS businesses.

Key accomplishments during 2014:

- 6 TTEEM projects were selected for awards to collectively receive \$1,045,833 of RGGI Industrial Innovations funds and will be leveraging \$1,845,577 of proposers' funds.
- 6 UV/EB projects were selected for awards to collectively receive \$842,394 of RGGI Industrial Innovations funds and will be leveraging \$863,684 of proposers' funds.
- In April 2014, NYSERDA made three awards under the Advanced Buildings program PON 2846 totaling \$635,433. Awarded projects include: Data Center Quick Assessment Tool and

New IT Efficiency Metric, System Level Integration and Optimization of Warm Water Cooling Technologies, and Computer Room Air Conditioner (CRAC) By-Pass Fans for Air Management in Enclosed Aisle Data Centers. Two projects have been signed, and the third project did not make it through negotiations due to the contractor's inability to meet the requirements recommended by the Technical Evaluation Panel.

4.3.2 Climate Research and Analysis Program

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

Key accomplishments during this quarter:

- 24 proposals were received in response to a solicitation focused on *Climate Change Adaptation Research and Strategies*. \$1.6 million was available for projects. The technical evaluation panels will meet in January and February of 2015.
- Development of the alpha release of the Web-based New York Climate Change Science Clearinghouse is underway. Many end-user stakeholders are being interviewed to determine how users search for content and navigate the site/tools. The project team presented a version of the website to the environmental commissioners of New England states who are interested in having similar sites developed by the clearinghouse team.
- NYSERDA provided an overview of climate change science and the most recent ClimAID projections to the first interagency meeting in support of the Community Risk and Resiliency Act (CRRA). Signed by the Governor in September 2014, the act will require agencies to consider future physical climate risks caused by storm surges, sea level rise or flooding in certain permitting, funding and regulatory decisions. NYSERDA updated ClimAID projections which are expected to be used as the basis for agency action under the CRRA.
- On November 3, 2014, NYSERDA hosted a meeting of the Interagency Climate Change Adaptation Workgroup. This group shares climate adaptation information and helps coordinate efforts between agencies. The group's work will jump-start activities that will now be required as a result of the CRRA.
- The Nature Conservancy (TNC) held a webinar to showcase how the results of the NYSERDA-funded *Marsh Migration Under Sea Level Rise* modeling project were integrated into TNC's Coastal Resilience tool. Coastal Resilience is a widely known visualization tool for sea level rise; the integration of NYSERDA's Sea-Level Affecting Marshes Model (SLAMM) data will likely greatly increase the use of the project results.
- NYSERDA participated in a workshop in support of the Climate Adaptation Toolkit that TNC is developing for NYSERDA. The intent of the meeting was to gather feedback from potential end users of the toolkit regarding which mapping layers are most important and how the outputs should be formatted. The project is expected to wrap up with outreach in the spring and summer of 2015.

Success Story 2: RGGI Proceeds Help Improve Efficiency of Drying Paints, Adhesives with Ultraviolet Light and Electron Beam Technologies

RGGI proceeds helped create a technology application center at SUNY College of Environmental Science and Forestry that is working with approximately 12 industry partners to decrease their greenhouse gas emissions through innovative technology. The energy emitted from ultraviolet light or electron beam sources helps dry innovative paints and adhesives quickly and efficiently, removing the typical use of an energy-intensive drying oven that would otherwise be needed for conventional paints. This technique reduces the amount of energy usage (therefore reducing greenhouse gases), eliminates the emissions of solvents that are components of conventional paints, and eliminates the impacts of such solvents which would otherwise be released to the environment or treated via an energy-intensive fossil fuel-fired thermal oxidizer pollution control system. Studies show a roughly 85 percent reduction in energy consumption with this innovative

4.3.3 Clean Energy Business Development

The Clean Energy Business Development program seeks to support emerging business opportunities in clean energy and environmental technologies while maintaining the goal of carbon mitigation. Key elements of the program include providing financial support to lever private investment in early-stage and expansion-stage clean-energy companies in New York State and accelerate the market introduction of innovative energy efficiency, renewable energy, or carbon abatement technologies; advancing the transition of clean-energy technologies or technologies that improve the energy efficiency of industrial processes from the development/demonstration stage to the launch of commercial-scale manufacturing or application; and developing and supporting a portfolio of programs designed to translate clean energy technology research into commercially viable business enterprises.

The Photovoltaic Manufacturing Consortium (PVMC) is a \$5 million effort with more than 40 industrial collaborators as members or affiliates. Its goal is to accelerate the development, commercialization, manufacturing, field testing and deployment of next-generation solar electric and lightweight photovoltaic systems.

Key accomplishments during this quarter:

- Approval was received to develop a competitive solicitation to invest in one or more new clean energy technology accelerators in New York. Also, program staff has met with over 100 potential stakeholders and parties that might have an interest in a clean energy technology investment fund. The customer discovery process help to refine the value proposition for the program, identify channels to the customers and define critical success factors for the initiative. It is expected that a competitive solicitation to select a fund manager will be issued in the first half of 2015.
- PVMC is finalizing agreements with OMG Roofing Products. OMG is a major supplier of fasteners and other hardware for roofing systems and are interested in developing a mounting mechanism for solar electric systems.

4.3.4 ChargeNY

With RGGI funding for ChargeNY, NYSERDA will pursue two main strategies to promote plug-in electric vehicle (PEV) adoption. First, NYSERDA will implement an outreach and education campaign to build interest in PEVs among key audiences, such as employers, car dealers, and the general public. Forging connections between these groups and aligning their incentives is a critical element of greater PEV adoption that has been lacking in New York State and one that is essential to spur more private investment in PEV purchases and PEV charging stations. Second, NYSERDA will support the installation of PEV charging stations throughout the State by establishing a purchasing collaborative to help bring down the costs of charging stations through bulk purchasing. RGGI funds will be used for additional incentives for charging stations at targeted location types, such as workplaces, municipal lots, and multifamily buildings, that have been seen to be effective drivers for PEV adoption based on usage data reported from previous installations. RGGI funds may also be used to initiate the deployment of a network of DC fast charge stations across the State.

Key accomplishments during this quarter:

- NYSERDA began developing its programs for expanding PEV infrastructure and engaging with employers, car dealers, the general public, and other key audiences, with solicitations expected to be official in the first half of 2015.

4.3.5 Transportation Research

The goal of the Transportation Research Program is to commercialize technologies, products, systems, and services that provide superior GHG reduction. Activities include product development, performance validation, field testing, policy development, and business assistance to help emerging technologies achieve successful commercialization.

Key accomplishments during this quarter:

- LCE Bioenergy’s investigation of the feasibility of demonstrating dimethyl ether (DME) as a highway fuel in New York State found that significant subsidies would be necessary to build the necessary biorefinery and run the vehicle demonstrations. Based on this preliminary finding, LCE has deferred completion of a final report. (DME is a nontoxic potential fuel source for gasoline and diesel engines. Its handling properties are similar to propane, and it can be produced from the gasification of locally grown hybrid willow feedstock.)
- SUNY’s Regenerative Shock Absorber project team continued to develop a prototype and performed preliminary tests. Their goal is to develop a shock absorber that produces electricity, using energy that conventional shock absorbers dissipate as heat. Generated electricity would power auxiliary systems or augment operation of a hybrid-electric powertrain. The project has stirred the interest of vehicle manufacturers and work has continued under other funding sources. A final report is under review.
- EDO Corporation continued to develop a hybrid pneumatic drivetrain as a more efficient alternative to hybrid-electric and hybrid-hydraulic systems with a preliminary focus on refuse trucks. Preliminary system design and market analysis are complete, and transfer case design, motor and compressor-detailed design, and controller design are continuing. In addition, a full-scale prototype system has been assembled.
- New York Trans Harbor, LLC has designed and determined the cost of a prototype positive restraint device for ferry boats currently servicing the New York City harbour. Most passenger ferries operating in the New York Metropolitan Area are using engine power to hold their boats to the dock. Moreover, ferry throttles are often held at one-half to three-quarter position to safely allow passengers to embark and disembark the vessel. Thus, these vessels are burning significantly more fuel than necessary to carry passengers across the river and emitting significant pollutants in the air of a Severe Non-Attainment Area. The use of a ferry docking system would allow diesel ferries to use auxiliary power or throttle back, rather than remain at high throttle, during loading and unloading thereby reducing fuel use and harmful emissions. A demonstration of the technology is planned for a future project.

4.3.6 Carbon Capture, Recycling, and Sequestration

This program area aims to build New York State’s capacity for long-term GHG emissions reduction by researching strategies to prevent emissions from being released into the atmosphere. The program focuses on assessing and demonstrating carbon capture, reuse, compression, and transport technologies; characterizing and testing the State’s geological sequestration potential; and supporting the development of carbon capture and sequestration demonstration projects in New York State. Currently, the program’s largest supported project is TriCarb, which is located in Rockland County, NY. TriCarb is leveraging NYSERDA funding with more than \$8 million of U.S. Department of Energy funds to investigate the potential for geological sequestration in the Newark Basin.

Key accomplishments during this quarter:

- All lab work and analysis has been completed. The TriCarb project has moved into the reporting phase.

4.3.7 Competitive Greenhouse Gas Reduction Pilot

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

Key accomplishments during this quarter:

- The Competitive Greenhouse Gas Reduction Pilot Program (RFP 2857) opened for participation on December 30, 2014. Proposals that demonstrate market ready technologies that reduce GHG emissions from the power sector in New York State are due by March 15, 2015. A bidder's teleconference is scheduled for January 15, 2015, where NYSERDA will review the bid proposal process and requirements.

4.4 Community Clean Energy

4.4.1 Climate Smart Communities

Established in 2009, the Climate Smart Communities (CSC) Program is comprised of a network of local governments across the State that have committed, by adopting the Climate Smart Communities Pledge, to reduce greenhouse gas (GHG) emissions and better prepare for unavoidable changes in climate. In addition to NYSERDA, the CSC program works in partnership with five other New York State agencies: the Department of Environmental Conservation (DEC), the Department of State (DOS), the Public Service Commission (PSC), the Department of Transportation (DOT), and the Department of Health (DOH).

In March 2011, NYSERDA issued a competitive solicitation to select contractors for a three-year CSC Regional Coordinators Pilot Program. The goal of this pilot program is to create and implement a strategic plan for engaging local governments in the CSC program, producing measurable results for climate protection and adaptation within each region, and developing important elements of guidance for local governments. The pilot program is now in its third and final year.

Key accomplishments during this quarter:

- The number of Climate Smart Communities increased to 146 across the State.
- The final year of the CSC pilot program kicked off. Highlights of activities during the first quarter of the third and final year include:
 - Four new Climate Smart Communities were recruited.
 - The Central New York CSC coordinator is partnering with Cazenovia College professors, students, and administrators on two projects: the Climate Action Plan for the Town and Village and a potential bike-share program for students and faculty.
 - The Mid-Hudson coordinator began piloting a new climate action plan template with the Town of Mamaroneck, the Village of Dobbs Ferry, and the Town of Clarkstown, helping them to develop custom climate action plans over the next year.
 - The Town of Brookhaven, with the assistance of the Long Island coordinator, secured a number of partners to initiate a Solarize program.
 - The Statewide coordinator hosted multiple greenhouse gas inventory training workshops for community leaders across the State.

4.4.2 Economic Development Growth Extension Program (EDGE)

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

Key accomplishments during this quarter:

- 52 new partnerships that may help to identify and assist in customer engagement were developed, bringing the total to 854 partnerships.
- 132 public outreach activities, such as events, presentations or other speaking engagements were conducted, bringing the total to 856 public outreach activities.
- 674 projects were referred to various NYSERDA programs, bringing the total number of referrals to 3,095.
- 578 project referrals from partners were received, bringing the total to 2,435 project referrals.
- Outreach and program support was provided to the REDCs on 26 projects, bringing the total to 212.

4.4.3 Cleaner, Greener Communities

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

Key accomplishments during this quarter:

- NYSERDA executed 14 additional contracts for CGC Round 1 awarded projects for a total of 29 executed contracts, which include comprehensive planning activities and large-scale sustainability projects.
- NYSERDA received 16 new applications for incentives to 15 municipalities for adoption of streamlined permitting processes for solar electric systems or electric vehicle supply equipment (EVSE).
- NYSERDA announced awards for the second round of funding (\$30 million) for Phase II of the CGC program, which included 32 Category 2 planning initiative projects and 13 Category 3 community-scale sustainability projects.
- Once completed, 18 Round 1 Category 3 community-scale sustainability projects that are currently in progress are anticipated to:
 - Leverage over \$15.6 million funds.
 - Retain 58 jobs.
 - Directly save 27,372 tons CO₂e per year and indirectly save 86,734 tons CO₂e per year.
 - Save 1,692,126 MMBtu of fossil fuels.
 - Directly save participants \$1.7 million per year in energy costs and indirectly save non-participants \$20.8 million per year in energy costs.

Success Story 3: RGGI Proceeds Help Reduce Carbon Emissions with Sustainable and Mixed-Use Urban-Style Town Square

Proceeds from RGGI helped develop I-Square LLC, a sustainable, mixed-use urban style town square in the Town of Irondequoit, a project that will result in the reduction of more than 760 tons of carbon dioxide on an annual basis. This reduction is being accomplished by cutting vehicle miles traveled, using alternative modes of transportation, and introducing energy efficiency measures such as installation of LED street lights. A Community Meeting Center featuring various energy efficiency measures has been completed.

The project was first established in March 2011 to redevelop and revitalize an approximate 2.5-acre distressed retail/residential area in the center of the Town of Irondequoit. Prior to I-Square LLC's ownership, the area had been neglected for years, becoming distressed and in disrepair, with empty storefronts, vacant office space and rundown housing, all of which have a negative impact on the area's potential. Through NYSERDA's Cleaner, Greener Communities Program, which encourages local communities across the State to become more sustainable and energy efficient, the I-Square development will include a 92,000-square foot, urban-style town square with state-of-the-art infrastructure and ecofriendly amenities. The overall project will incorporate various energy efficiency and renewable energy technologies.

4.4.4 Regional Economic Development and Greenhouse Gas Reduction Program

The Regional Economic Development and Greenhouse Gas Reduction (REDGHG) Program supports projects that are identified as priority initiatives consistent with Governor Cuomo's Regional Economic Development Council (REDC) initiative, and which are not otherwise provided financial support by other NYSERDA programs or initiatives. REDGHG provides cost-share 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. REDGHG focuses on several end uses, including transportation, manufacturing and industrial process, buildings, agriculture, municipal processes, renewable electric generation, and district energy.

Key accomplishments during this quarter:

- 15 projects received awards from program inception through December 31, 2014.
- 12 projects are in progress.
- 3 projects have been completed.

4.4.5 Green Jobs – Green New York

Green Jobs - Green New York provides funding for energy assessments, low-cost financing for energy upgrades, and technical and financial support to develop a clean energy workforce. GJGNY is a statewide effort to strengthen communities through energy efficiency and uses constituency-based organizations (CBOs) to support program outreach in underserved communities. GJGNY enables New Yorkers to make a significant difference in homes, businesses, and neighborhoods—making them more comfortable, sustainable, and economically sound. GJGNY is administered by NYSERDA, and made available by the Green Jobs - Green New York Act of 2009. The GJGNY 2014 Annual Report was issued in September 2014.⁴ The report presents financial data for the approved GJGNY programs through December 31, 2014.

4.4.5.1 Assessments

One- to Four-Family Residential Buildings Program Assessments

Home Performance with ENERGY STAR[®] (HPwES) is a comprehensive energy efficiency services program for existing one- to four-family homes. Participating Building Performance Institute (BPI) GoldStar contractors conduct comprehensive home energy assessments and upgrades. Free and reduced-cost home energy assessments have been made available to homeowners in New York State through GJGNY funding, which drives increased participation in this program and cuts additional GHG emissions.

⁴ NYSERDA. 2014. “Green Jobs - Green New York 2014 Annual Report.” <http://www.nysesda.ny.gov/About/Green-Jobs-Green-New-York/GJGNY-Advisory-Council-Reports>.

Key accomplishments during this quarter:

- 4,934 assessments were completed this quarter, bringing the total to 64,924 residential GJGNY assessments completed; 60,153 (93 percent) were provided at no cost to the customer.
- Of the program cumulative 18,406 completed residential units served through HPwES resulting from a GJGNY assessment and/or GJGNY financing, 5,995 (33 percent) units are associated with income-qualified Assisted HPwES customers.
- In October 2014, the program received a monthly record high of 3,499 new audit applications.
- CBOs assisted with the completion of 1,367 units, or 7 percent of all completed GJGNY residential retrofits.

Multifamily Performance Program Assessments

Through GJGNY, the Multifamily Performance Program provides financing and co-funding for comprehensive energy assessments and the development of an Energy Reduction Plan (ERP), serving market-rate and low- to moderate-income residential buildings with five or more units to increase adoption of clean energy in New York State. The needs of the multifamily sector are addressed by working with developers, building owners, and their representatives to improve the energy efficiency, health, safety, and security of multifamily residential buildings, targeting potential participants who are committed to the implementation of energy-related improvements. NYSERDA offers incentives to install eligible measures outlined within the ERP. Each incentive is subject to funding availability from the Energy Efficiency Portfolio Standard (EEPS) or RGGI. Per-unit incentives are available for projects predicted to achieve the 15 percent energy reduction threshold. Additional performance payments apply to eligible projects that predict and achieve savings of more than 20 percent.

Key accomplishments during this quarter:

- A total of 313 assessments were completed through December 31, 2014; of these, 56 percent are associated with affordable housing.
- Of the program cumulative 30,104 residential units served with installed measures, 16,451 (55 percent) units are associated with affordable housing.
- A total of 334 projects are contracted to have measures installed; 58 percent of which are associated with affordable housing.

Small Commercial Energy Efficiency Program Assessments

The GJGNY Small Commercial Energy Efficiency Program offers energy assessments and technical assistance to help small businesses and not-for-profit organizations improve their energy efficiency and reduce their energy costs in support of the goal to increase adoption of clean energy projects in New York State. The program offers free energy assessments, along with technical assistance, to help identify economically viable improvements that may yield substantial annual energy savings. GJGNY energy assessments are offered to small businesses and nonprofits with an average electric demand of 100 kW or less and 10 employees or fewer. Assessments and technical assistance are provided by regional firms competitively selected by NYSERDA.

Key accomplishments during this quarter:

- 108 new energy assessments were completed during this quarter, bringing the total number of completed assessment to 2,313.
- NYSERDA conservatively estimates that 20 percent of energy efficiency improvements recommended on energy assessments are implemented by small business and not-for-profit customers, resulting in an estimated total of 462 completed projects through December 31, 2014.

4.4.5.2 Financing

One- to Four-Family Residential Buildings Program Financing

GJGNY financing is available to participants in Home Performance with ENERGY STAR[®] (HPwES) to finance the installation of recommended energy efficiency improvements that may be repaid through energy savings. The Smart Energy Loan and the innovative On-Bill Recovery (OBR) Loan are the two low-interest rate financing options available through GJGNY, which enable more projects resulting in greater reductions of GHG emissions than might otherwise have been achieved.

Key accomplishments during this quarter:

- A total of 6,940 loans have been issued with a total loan value of \$70.35 million.
- 27.3 percent of the loans issued are associated with Assisted HPwES customers, representing 20.3 percent of the total loan funds.
- Through December 31, 2014, a total of 2,099 energy efficiency OBR Loans have closed, valued at approximately \$22.97 million.
- Through December 31, 2014, a total of 250 (solar electric) PV Loans have closed, valued at \$4.2 million.

Multifamily Performance Program Financing

Launched in 2011, financing through the Multifamily Performance Program under GJGNY includes programs and incentives for owners, facility managers, developers, and condo/co-op boards of multifamily buildings with five or more units in support of the goal to increase adoption of clean energy in New York State. These programs make it easier to assess, fund, implement, and measure energy efficiency upgrades that improve building performance and reduce costs. The program makes participation loans available in which a participating lender issues a loan to a multifamily building owner for a qualifying energy efficiency project, with NYSERDA participating in the funding of 50 percent of the loan (up to a maximum of \$5,000 per unit or \$500,000 per building) at zero percent interest, and the lender setting the interest rate on its share of the loan.

Key accomplishments during this quarter:

- 16 loans have closed with a total value of \$10.4 million through December 31, 2014. NYSERDA's share of the total loan value is \$3.3 million.

Small Commercial Energy Efficiency Program Financing

The GJGNY Small Commercial Energy Efficiency Program offers low-interest financing to help small businesses and not-for-profit organizations improve their energy efficiency and reduce their energy costs in support of the goal to increase adoption of clean energy in New York State. In June 2011, NYSERDA launched the Participation Loan product to small business and not-for-profit customers, in which NYSERDA provides 50 percent of the loan principal, up to \$50,000, at two percent interest and the participating lender provides the remaining loan principal at its market interest rate. In June 2012, NYSERDA launched the OBR Loan for small business and not-for-profit customers, making available a NYSERDA loan of up to \$50,000 at 2.5 percent interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill. Thirteen lenders have agreed to offer Participation Loans or OBR loans or both.

Key accomplishments during this quarter:

- Through December 31, 2014, a total of five OBR Loans have been closed with a total value of \$116,994. NYSERDA's share of the total value is the full amount.
- Through December 31, 2014, a total of nine Participation Loans have been closed with a total value of \$513,905. NYSERDA's share of the total value is \$237,563.

4.4.5.3 Workforce Development, Outreach, and Marketing

Workforce Development

The GJGNY Workforce Training and Development (WFD) initiative complements other NYSERDA and New York State Department of Labor (NYS DOL) programs targeted at preparing individuals for energy efficiency, solar thermal, and solar electric careers in New York State. WFD programs also help to build New York State's capacity for long-term carbon reduction and facilitate energy education programs that will help build the State's clean energy future. Specifically, WFD efforts under GJGNY seek to expand energy-specific content in New York State Registered Apprenticeship and third-party accredited building trades programs, to increase access to technical training workshops for skills enhancement and certification, and to bridge the gap between training and employment through on-the-job training incentives for businesses seeking to hire and train new workers while reaching out to low-income neighborhoods to expand training opportunities to these communities.

Key accomplishments during this quarter:

- The on-the-job training (OJT) program began in June 2011 and ended December 31, 2014 with a lifetime total of 525 individuals hired by 81 clean energy companies across New York State.
- 59 businesses were funded under GJGNY resulting in 263 hires in energy efficiency, solar thermal, and solar electric positions.
- The program will be reinstated in the first quarter of 2015 but with a revised focus on emerging and underutilized technologies including solar thermal, biomass, and heat pump and will be funded under the Technology and Market Development portfolio.

Outreach and Marketing

GJGNY provides for community-based outreach, enabling one-to-one assistance with the process of participating in the program to deliver services in underserved communities. GJGNY provides outreach services in targeted communities through CBOs, which locate residents, businesses, not-for-profits, multifamily building owners, and potential workforce candidates to participate in the program. This community-based approach, combined with statewide marketing, is expected to increase the reach of the program, particularly among disadvantaged populations and those not traditionally participating in energy efficiency programs. Participating in the programs empowers these communities in their transition toward sustainability, while producing lower carbon emissions.

Key accomplishments during this quarter:

- Through December 31, 2014, CBOs were responsible for 4,726 completed assessments, which resulted in 1,367 completed retrofits. Approximately 51 percent of those retrofits were for Assisted HPwES customers.
- Work continues on the Energy Champions Referral Program, which will allow individuals to become “Energy Champions” and nonprofits to become “Energy Champion Partner Organizations” when they refer homeowners to the HPwES Program. Energy Champions as well as Partner Organizations will receive monetary as well as nonmonetary benefits from the Home Performance contractor for successfully recruiting homeowners who complete a retrofit. The program has secured 13 partner organizations and 30 individual Energy Champions.
- Pratt Center for Community Development, working with Brooklyn CBO El Puente, has translated the Home Performance flyers into Spanish. They have been distributed to the Downstate CBOs.
- Sustainable South Bronx (SSBx) continues to move forward on the Shorehaven Low Rise Program. Shorehaven Condominiums is located on the southern point of Clason Point in the Bronx. The Home Owner’s Association is working with CBO BrightHome to get their residents through the Home Performance program. Applications are ready to be submitted, and SSBx is awaiting approval on a process for conducting the audits. Once approval is received, the initial audits will be scheduled.

4.5 NY Green Bank

NY Green Bank (NYGB), a division of NYSERDA, is a \$1 billion initiative that was proposed by Governor Cuomo in his 2013 State of the State address. NYGB is a central component of Governor Cuomo’s strategic statewide vision to scale up clean energy markets, enhance New York State’s competitiveness for clean energy businesses, and make the State’s energy systems more resilient. NYGB operates in the wholesale financing markets in partnership with private sector sources of capital. It fosters greater private sector investment in projects deploying proven energy, renewable energy, efficiency, and other clean technologies. NYGB officially opened for business in February 2014.

Key accomplishments during this quarter:

- Held first NYGB Advisory Committee meeting on October 14, 2014.
- Governor Cuomo issued a press release announcing in principle the first seven NYGB transactions on October 22.
- Petition to Complete Capitalization for the NYGB was submitted to the PSC on October 30, 2014, with ongoing participation in the Petition stakeholder comment process.
- Filed first quarterly Metrics Report with the PSC on November 14.
- Hosted and ran the Second Annual International Green Bank Summit in New York City on November 17-18.

- Completed key hires to fill NYGB risk and compliance, operations, investments, and administrative positions to support ongoing business needs and growth.

4.6 Program Evaluation

Several RGGI evaluation studies are underway or in the planning stages as of the fourth quarter of 2014. The study objectives and timing are discussed in the following sections. Other study plans are also in development and will be detailed in future quarterly reports. The following types of evaluation activities are being performed:

- **Impact Evaluation** measures the outcomes and benefits of a program, calculates the cost-effectiveness of the program, and compares the outcomes to the program goals.
- **Market Evaluation** develops an understanding of markets and market actors, provides information to support program design and delivery, and tracks changes in markets over time.
- **Process Evaluation** reviews oversight and operations, gauges customer satisfaction, and recommends process and efficiency improvements.
- **Logic Model Reports** inform evaluation work by documenting the relationships between program activities; activity outputs; and the short, medium, and long-term outcomes the program intends to induce.
- **Evaluation Readiness Reviews**⁵ help identify whether a program has various factors or, when these will be in place, that will ensure an evaluation is justified, feasible, and likely to provide useful information.

In addition, two major baseline studies are underway with support from RGGI evaluation funds and are described herein.

4.6.1 Evaluation of Energy Efficiency and Other Deployment Programs

Cleaner, Greener Communities (CGC) Program: The CGC Process Evaluation will utilize in-depth interviews, surveys, and secondary data collection to determine whether Phase I plans provide a sound foundation for achieving the regions' stated goals, and whether the plans and planning process support rapid commitment to the goals and engagement in the planned activities. Understanding success factors and challenges will help optimize ongoing investments of monetary and nonmonetary resources in the State through the CGC initiative. This study kicked-off in July 2014, with a completion date of March 2015. Three waves of data collection were initially planned for this evaluation in order to provide program staff with interim results to assist with program planning. Wave One was completed in December 2014. The status of Wave Two and Wave Three will be assessed based on these initial results.

⁵ Formerly known as Evaluability Assessment.

GJGNY Small Commercial Energy Efficiency Program: NYSERDA is conducting an Impact Evaluation to quantify the measure adoption rate over time and the degree to which the audit program influenced participants' decision-making regarding recommended measures that they have installed. The study is expected to be completed in the second half of 2015. This Impact Evaluation has been prioritized ahead of the Phase 2 Process/Market Evaluation study.

Multifamily Performance Program: A major Impact Evaluation of the System Benefits Charge (SBC)/EEPS-funded MPP is being conducted to assess the effects of RGGI fuel efficiency incentives. The study includes measurement and verification of energy savings, and attribution analysis of projects completed from 2009 through 2011. The study is expected to be completed in the first half of 2015. A major Process/Market Evaluation of the SBC/EEPS-funded MPP was undertaken to assess the RGGI fuel efficiency incentive activity and GJGNY assessment/loan activity. This study was finalized in the third quarter of 2014 and published on the NYSERDA website.⁶

Multifamily Carbon Emission Reduction Program: NYSERDA is conducting an Impact Evaluation to measure and verify the energy and emission effects attributable to the program. The evaluation is expected to be completed in mid 2015.

Home Performance with ENERGY STAR Program: An Impact Evaluation of the Green Jobs – Green New York “assessment only” participants is currently underway. This evaluation seeks to identify those who may have received a GJGNY-funded audit and installed measures on their own in the absence of incentives. NYSERDA is also undertaking an Impact Evaluation to measure and verify effects attributable to RGGI fuel incentives. These studies will leverage major, in-progress evaluation of the SBC/EEPS-funded HPwES program. The completion date for the Impact Evaluation work is planned for second quarter 2015. A major Process/Market Evaluation of the SBC/EEPS-funded HPwES is also being used to assess the RGGI fuel efficiency incentive activity and GJGNY assessment/loan activity. The Process/Market Evaluation study is expected to be completed in the first quarter 2015. The impact and process evaluations will be occurring at the same time and the evaluation teams are collaborating to use survey efforts to gain efficiencies and reduce survey fatigue.

⁶ Multifamily Performance Program/Process Evaluation and Market Characterization
(<http://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-MPP-Process-Evaluation.pdf>)

GJGNY Constituency-Based Organization (CBO) Program: The assessment of CBO-related activities will be addressed as a part of the above HPwES process evaluation and includes surveys with CBO-affiliated HPwES participants, partial participants (GJGNY audit recipients), and contractors. These CBO samples will be strata within the HPwES process evaluation, market characterization and impact evaluation surveys. The completion date for this evaluation effort is planned for the first quarter 2015.

Residential Non-Energy Impact Study: A study is currently underway to identify and begin to quantify measurable nonenergy effects from residential programs, including possibly HPwES and the Green Residential Building Program. This study is jointly supported with RGGI and other NYSERDA funds. The study is expected to be completed in early 2015 and is expected to help inform future nonenergy impact analysis and reporting for RGGI programs.

4.6.2 Evaluation of Technology/Business Development and Research Programs

Advanced Transportation Research: A Logic Model report will be released after the completion of the Evaluation Readiness Review in early 2015.

Industrial Innovations: Future evaluation plans for this program are under consideration at this time.

Clean Energy Business Development: An Evaluation Readiness Review was completed in the fourth quarter of 2014. A Market Evaluation of the clean energy industry is planned to commence in the first quarter of 2015 and be completed in the third quarter of 2015. A social network analysis is under consideration for the same timeframe, and will describe the strength of the links between NYSERDA program participants and other market actors in the larger clean energy network. Results of the social network analysis, if conducted, will feed into a market impact assessment for CEBD-funded incubators, where firms will be selected for in-depth case studies.

Power Systems Program: For the Advanced Renewable Energy component of the program, a Logic Model report and Evaluation Readiness Review were recently completed in the third quarter as planned and further evaluation activities are still being determined. The final logic model is available on NYSERDA's website.⁷

4.6.3 Baseline Studies

NYSERDA is also conducting two major baseline studies to assess residential and commercial markets across a broad range of customer segments and energy measures. The goals of these studies are: 1) to better understand building stock and associated energy use, including saturations of energy-consuming measures, penetrations of energy-efficient equipment, building characteristics and energy management practices; and 2) use this information to estimate the technical, economic and achievable energy efficiency opportunities in New York State in the next three and five years. Although these large studies are being supported by SBC funding, RGGI funds are supplementing the budget to allow for robust data collection on fuel measures.

The Residential Baseline study was completed in the fourth quarter of 2014. The final report will be posted to NYSERDA's website soon. The Commercial Baseline study request for proposals was released in the fourth quarter of 2013, and proposals were received in the first quarter of 2014. Contract negotiation is near complete and study planning and implementation for the Commercial Baseline is expected to begin in early 2015 after an agreement is finalized with the selected contractor.

⁷ [Clean Power Technology Innovation/Logic Model/2014 \(http://www.nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-CPTI-Logic-Model-Report.pdf\)](http://www.nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-CPTI-Logic-Model-Report.pdf)

Appendix A: Savings Calculations Methodology

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 New York’s Regional Greenhouse Gas Initiative Investment Plan (2013 Operating Plan).

A.1 Energy Savings

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

A.2 CO₂ Reductions

Emissions factors are used to translate the energy savings data into annual GHG emissions reduction values. The GHGs evaluated in the report include carbon dioxide, methane, and nitrous oxide. Because each of these gases has a different global warming potential,⁸ emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO₂e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,⁹ shown in Table A-1.

Table A-1. Global Warming Potentials

These values represent a 100-year time horizon.

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

| Gas | Global Warming Potential |
|-----------------------------------|--------------------------|
| Carbon dioxide (CO ₂) | 1 |
| Methane (CH ₄) | 21 |
| Nitrous Oxide (N ₂ O) | 310 |

⁸ 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.

⁹ Intergovernmental Panel on Climate Change. 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.

NYSERDA uses the emission factors shown in Table A-2 to calculate emissions from on-site fuel combustion, which are derived from U.S. Environmental Protection Agency (EPA) emission coefficients. The CO₂e values represent aggregate CO₂, CH₄, and N₂O emissions. If a program covers more than one sector, then the estimated reduction is based on a calculated average emission factor for the affected sectors.

Table A-2. Fuel Combustion Emission Factors by Sector

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

| | Transport (lb CO₂e/MMBtu) | Residential (lb CO₂e/MMBtu) | Commercial (lb CO₂e/MMBtu) | Industrial (lb CO₂e/MMBtu) |
|--------------------------|---|---|--|--|
| Coal | N/A | 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 | N/A | N/A | 166.28 | 174.20 |
| Kerosene | N/A | 162.10 | 162.10 | 159.89 |
| Propane | 140.51 | 136.94 | 136.94 | 139.45 |
| Gasoline | 159.09 | N/A | N/A | N/A |
| Aviation Fuel | 160.86 | N/A | N/A | N/A |
| Wood | N/A | 15.79 | 15.79 | 3.92 |
| Steam | N/A | 139.30 | 139.30 | N/A |

An average emission factor of 625 pounds of CO₂e/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.¹⁰ Although electricity savings may not lead to near-term emission reductions under the RGGI CO₂ cap, savings will potentially reduce imports of electricity to New York State; the demand for CO₂ 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.

¹⁰ The emission factor for electricity is based on data from *Patterns & Trends - New York State Energy Profiles: 1997 – 2011* (NYSERDA 2013) and methodology from the *GHG Inventory and Forecast* prepared for the 2014 Draft New York State Energy Plan (April 2014).

A.3 Bill Savings

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

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

Table A-3. Fuel Prices by Sector^a

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

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

^a For electricity and natural gas, prices are an average of July 2012 and January 2013 prices as reported by the NYS Department of Public Service billing data <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/C56A606DB183531F852576A50069A75D?OpenDocument> For all other fuel types, prices reflect 2011 retail prices as reported in NYSERDA's *Patterns and Trends- New York State Energy Profiles: 1997-2011* (NYSERDA 2013)

Table A-4. Program Measure Life Assumptions

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

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

Appendix B: Former Program Names

Table B-1. Former Program Names

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

Appendix C: Summary of Portfolio Benefits

Table C-1. Summary of Portfolio Benefits

| Quarter End Date | Quarter | Cumulative Annual MMBtu | Cumulative Annual MWh Saved | Cumulative Annual MWh Generated | Cumulative Annual Tons of CO ₂ e Mitigated | Cumulative Annual Bill Savings Realized by Participating Customers (\$) |
|------------------|---------|-------------------------|-----------------------------|---------------------------------|---|---|
| 6/30/2010 | Qrt 2 | 3,409 | 4,371 | - | 2,100 | 700,000 |
| 9/30/2010 | Qrt 3 | 47,332 | 4,371 | - | 5,630 | 1,200,000 |
| 12/31/2010 | Qrt 4 | 91,471 | 838 | 4,316 | 9,310 | 2,900,000 |
| 3/31/2011 | Qrt 1 | 115,763 | 1,213 | 3,903 | 10,950 | 2,700,000 |
| 6/30/2011 | Qrt 2 | 152,501 | 5,233 | 3,992 | 15,553 | 4,000,000 |
| 9/30/2011 | Qrt 3 | 197,622 | 6,473 | 4,205 | 17,874 | 4,600,000 |
| 12/31/2011 | Qrt 4 | 256,980 | 8,126 | 4,218 | 23,805 | 6,000,000 |
| 3/31/2012 | Qrt 1 | 318,273 | 13,363 | 4,218 | 31,194 | 7,800,000 |
| 6/30/2012 | Qrt 2 | 411,462 | 13,702 | 4,248 | 40,368 | 9,400,000 |
| 9/30/2012 | Qrt 3 | 519,144 | 15,023 | 4,278 | 51,353 | 10,700,000 |
| 12/31/2012 | Qrt 4 | 577,025 | 16,895 | 4,345 | 56,764 | 12,000,000 |
| 3/31/2013 | Qrt 1 | 651,564 | 18,206 | 4,305 | 60,349 | 16,300,000 |
| 6/30/2013 | Qrt 2 | 770,186 | 20,038 | 4,386 | 69,068 | 18,100,000 |
| 9/30/2013 | Qrt 3 | 889,027 | 24,385 | 16,710 | 96,916 | 21,200,000 |
| 12/31/2013 | Qrt 4 | 985,379 | 26,545 | 16,752 | 100,934 | 23,100,000 |
| 3/31/2014 | Qrt 1 | 1,089,306 | 28,206 | 16,752 | 108,844 | 25,500,000 |
| 6/30/2014 | Qrt 2 | 1,174,186 | 28,697 | 20,331 | 115,852 | 27,700,000 |
| 9/30/2014 | Qrt 3 | 1,301,751 | 32,481 | 20,331 | 127,880 | 31,600,000 |
| 12/31/2014 | Qrt 4 | 1,503,898 | 47,784 | 93,297 | 141,081 | 50,000,000 |

Table C-2. Summary of Fuel Savings by Type

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|-------------|---------------------------|---|
| 6/30/2010 | Qrt 2 | Diesel | - | |
| 6/30/2010 | Qrt 2 | Gasoline | - | |
| 6/30/2010 | Qrt 2 | Natural Gas | - | |
| 6/30/2010 | Qrt 2 | Oil | 3,409 | |
| 6/30/2010 | Qrt 2 | Propane | - | |
| 9/30/2010 | Qrt 3 | Diesel | - | |
| 9/30/2010 | Qrt 3 | Gasoline | - | |
| 9/30/2010 | Qrt 3 | Natural Gas | - | |
| 9/30/2010 | Qrt 3 | Oil | 47,332 | |
| 9/30/2010 | Qrt 3 | Propane | - | |
| 12/31/2010 | Qrt 4 | Diesel | - | |
| 12/31/2010 | Qrt 4 | Gasoline | - | |
| 12/31/2010 | Qrt 4 | Natural Gas | 3,926 | |
| 12/31/2010 | Qrt 4 | Oil | 74,691 | |
| 12/31/2010 | Qrt 4 | Propane | 301 | |
| 12/31/2010 | Qrt 4 | Steam | 12,553 | |
| 3/31/2011 | Qrt 1 | Diesel | - | |
| 3/31/2011 | Qrt 1 | Gasoline | - | |
| 3/31/2011 | Qrt 1 | Natural Gas | 18,206 | |
| 3/31/2011 | Qrt 1 | Oil | 85,998 | |
| 3/31/2011 | Qrt 1 | Propane | 1,280 | |
| 3/31/2011 | Qrt 1 | Steam | 10157 | |
| 3/31/2011 | Qrt 1 | Wood | 122 | |
| 6/30/2011 | Qrt 2 | Diesel | - | |
| 6/30/2011 | Qrt 2 | Gasoline | - | |
| 6/30/2011 | Qrt 2 | Kerosene | 27 | |
| 6/30/2011 | Qrt 2 | Natural Gas | 20481 | |
| 6/30/2011 | Qrt 2 | Oil | 118,963 | |
| 6/30/2011 | Qrt 2 | Propane | 2,272 | |
| 6/30/2011 | Qrt 2 | Steam | 10,557 | |
| 6/30/2011 | Qrt 2 | Wood | 201 | |
| 9/30/2011 | Qrt 3 | Diesel | - | |
| 9/30/2011 | Qrt 3 | Gasoline | - | |
| 9/30/2011 | Qrt 3 | Kerosene | 208 | |
| 9/30/2011 | Qrt 3 | Natural Gas | 40,683 | |
| 9/30/2011 | Qrt 3 | Oil | 140,917 | |
| 9/30/2011 | Qrt 3 | Propane | 4,818 | |
| 9/30/2011 | Qrt 3 | Steam | 10,557 | |
| 9/30/2011 | Qrt 3 | Wood | 439 | |
| 12/31/2011 | Qrt 4 | Diesel | - | |

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 12/31/2011 | Qrt 4 | Gasoline | - | |
| 12/31/2011 | Qrt 4 | Kerosene | 285 | |
| 12/31/2011 | Qrt 4 | Natural Gas | 88,439 | |
| 12/31/2011 | Qrt 4 | Oil | 150,163 | |
| 12/31/2011 | Qrt 4 | Propane | 7,344 | |
| 12/31/2011 | Qrt 4 | Steam | 10,157 | |
| 12/31/2011 | Qrt 4 | Wood | 592 | |
| 3/31/2012 | Qrt 1 | Diesel | - | |
| 3/31/2012 | Qrt 1 | Gasoline | - | |
| 3/31/2012 | Qrt 1 | Kerosene | 285 | |
| 3/31/2012 | Qrt 1 | Natural Gas | 108635 | |
| 3/31/2012 | Qrt 1 | Oil | 186,637 | |
| 3/31/2012 | Qrt 1 | Propane | 11,810 | |
| 3/31/2012 | Qrt 1 | Steam | 10,157 | |
| 3/31/2012 | Qrt 1 | Wood | 749 | |
| 6/30/2012 | Qrt 2 | Diesel | - | |
| 6/30/2012 | Qrt 2 | Gasoline | - | |
| 6/30/2012 | Qrt 2 | Kerosene | 285 | |
| 6/30/2012 | Qrt 2 | Natural Gas | 140,597 | |
| 6/30/2012 | Qrt 2 | Oil | 246,477 | |
| 6/30/2012 | Qrt 2 | Propane | 12,798 | |
| 6/30/2012 | Qrt 2 | Steam | 10,157 | |
| 6/30/2012 | Qrt 2 | Wood | 1,000 | |
| 6/30/2012 | Qrt 2 | Residual Oil | 144 | |
| 9/30/2012 | Qrt 3 | Diesel | - | |
| 9/30/2012 | Qrt 3 | Gasoline | - | |
| 9/30/2012 | Qrt 3 | Kerosene | 285 | |
| 9/30/2012 | Qrt 3 | Natural Gas | 183,379 | |
| 9/30/2012 | Qrt 3 | Oil | 303,649 | |
| 9/30/2012 | Qrt 3 | Propane | 14,187 | |
| 9/30/2012 | Qrt 3 | Residual Oil | 144 | |
| 9/30/2012 | Qrt 3 | Steam | 15,901 | |
| 9/30/2012 | Qrt 3 | Wood | 1,599 | |
| 12/31/2012 | Qrt 4 | Diesel | - | |
| 12/31/2012 | Qrt 4 | Gasoline | - | |
| 12/31/2012 | Qrt 4 | Kerosene | 1,026 | |
| 12/31/2012 | Qrt 4 | Natural Gas | 203,118 | |
| 12/31/2012 | Qrt 4 | Oil | 337,096 | |
| 12/31/2012 | Qrt 4 | Propane | 16,593 | |
| 12/31/2012 | Qrt 4 | Residual Oil | 144 | |

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 12/31/2012 | Qrt 4 | Steam | 15,969 | |
| 12/31/2012 | Qrt 4 | Wood | 3,079 | |
| 3/31/2013 | Qrt 1 | Diesel | - | - |
| 3/31/2013 | Qrt 1 | Gasoline | - | - |
| 3/31/2013 | Qrt 1 | Kerosene | 1,359 | 353 |
| 3/31/2013 | Qrt 1 | Natural Gas | 231,225 | 90,488 |
| 3/31/2013 | Qrt 1 | Oil | 378,533 | 317,149 |
| 3/31/2013 | Qrt 1 | Propane | 18,848 | 7,747 |
| 3/31/2013 | Qrt 1 | Steam | 15,969 | 37,123 |
| 3/31/2013 | Qrt 1 | Wood | 5,129 | 1,338 |
| 3/31/2013 | Qrt 1 | Residual Oil | 144 | 27 |
| 3/31/2013 | Qrt 1 | Coal | 357 | - |
| 6/30/2013 | Qrt 2 | Diesel | - | - |
| 6/30/2013 | Qrt 2 | Gasoline | - | - |
| 6/30/2013 | Qrt 2 | Kerosene | 1,270 | 138 |
| 6/30/2013 | Qrt 2 | Natural Gas | 313,287 | 76,148 |
| 6/30/2013 | Qrt 2 | Oil | 411,518 | 262,809 |
| 6/30/2013 | Qrt 2 | Propane | 21,051 | 7,341 |
| 6/30/2013 | Qrt 2 | Steam | 15,969 | 30,232 |
| 6/30/2013 | Qrt 2 | Wood | 6,550 | 935 |
| 6/30/2013 | Qrt 2 | Residual Oil | 144 | 20 |
| 6/30/2013 | Qrt 2 | Coal | 397 | - |
| 9/30/2013 | Qrt 3 | Diesel | - | - |
| 9/30/2013 | Qrt 3 | Gasoline | - | - |
| 9/30/2013 | Qrt 3 | Kerosene | 1,365 | 356 |
| 9/30/2013 | Qrt 3 | Natural Gas | 415,512 | 182,146 |
| 9/30/2013 | Qrt 3 | Oil | 424,549 | 239,750 |
| 9/30/2013 | Qrt 3 | Propane | 23,656 | 24,099 |
| 9/30/2013 | Qrt 3 | Steam | 15,969 | 13,112 |
| 9/30/2013 | Qrt 3 | Wood | 7,497 | 2,203 |
| 9/30/2013 | Qrt 3 | Residual Oil | 144 | - |
| 9/30/2013 | Qrt 3 | Coal | 335 | - |
| 12/31/2013 | Qrt 4 | Diesel | - | - |
| 12/31/2013 | Qrt 4 | Gasoline | - | - |
| 12/31/2013 | Qrt 4 | Kerosene | 1,490 | 203 |
| 12/31/2013 | Qrt 4 | Natural Gas | 466,754 | 128,549 |
| 12/31/2013 | Qrt 4 | Oil | 466,125 | 236,933 |
| 12/31/2013 | Qrt 4 | Propane | 25,403 | 5,491 |
| 12/31/2013 | Qrt 4 | Steam | 15,969 | 15,977 |
| 12/31/2013 | Qrt 4 | Wood | 8,981 | 1,111 |
| 12/31/2013 | Qrt 4 | Residual Oil | 144 | - |

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 12/31/2013 | Qrt 1 | Coal | 514 | - |
| 3/31/2014 | Qrt 1 | Diesel | - | - |
| 3/31/2014 | Qrt 1 | Gasoline | - | - |
| 3/31/2014 | Qrt 1 | Kerosene | 1,594 | 80 |
| 3/31/2014 | Qrt 1 | Natural Gas | 509,205 | 130,012 |
| 3/31/2014 | Qrt 1 | Oil | 523,876 | 228,057 |
| 3/31/2014 | Qrt 1 | Propane | 27,788 | 5,869 |
| 3/31/2014 | Qrt 1 | Steam | 15,969 | 14,733 |
| 3/31/2014 | Qrt 1 | Wood | 10,270 | 580 |
| 3/31/2014 | Qrt 1 | Residual Oil | 144 | - |
| 3/31/2014 | Qrt 1 | Coal | 458 | - |
| 6/30/2014 | Qrt 2 | Diesel | - | - |
| 6/30/2014 | Qrt 2 | Gasoline | - | - |
| 6/30/2014 | Qrt 2 | Kerosene | 1,715 | 56 |
| 6/30/2014 | Qrt 2 | Natural Gas | 545,195 | 126,749 |
| 6/30/2014 | Qrt 2 | Oil | 569,438 | 225,510 |
| 6/30/2014 | Qrt 2 | Propane | 28,521 | 4,969 |
| 6/30/2014 | Qrt 2 | Steam | 15,969 | 14,733 |
| 6/30/2014 | Qrt 2 | Wood | 12,322 | 654 |
| 6/30/2014 | Qrt 2 | Residual Oil | 144 | - |
| 6/30/2014 | Qrt 2 | Coal | 882 | - |
| 9/30/2014 | Qrt 3 | Diesel | - | - |
| 9/30/2014 | Qrt 3 | Gasoline | - | - |
| 9/30/2014 | Qrt 3 | Kerosene | 2,494 | 706 |
| 9/30/2014 | Qrt 3 | Natural Gas | 526,170 | 184,391 |
| 9/30/2014 | Qrt 3 | Oil | 723,190 | 381,324 |
| 9/30/2014 | Qrt 3 | Propane | 17,860 | 28,153 |
| 9/30/2014 | Qrt 3 | Steam | 15,969 | 18,269 |
| 9/30/2014 | Qrt 3 | Wood | 14,952 | 4,079 |
| 9/30/2014 | Qrt 3 | Residual Oil | - | - |
| 9/30/2014 | Qrt 3 | Coal | 1,115 | 86 |
| 12/31/2014 | Qrt 4 | Diesel | - | - |
| 12/31/2014 | Qrt 4 | Gasoline | - | - |
| 12/31/2014 | Qrt 4 | Kerosene | 2,602 | 669 |
| 12/31/2014 | Qrt 4 | Natural Gas | 644,280 | 219,296 |
| 12/31/2014 | Qrt 4 | Oil | 804,029 | 433,001 |
| 12/31/2014 | Qrt 4 | Propane | 17,967 | 8,699 |
| 12/31/2014 | Qrt 4 | Steam | 15,969 | 18,269 |
| 12/31/2014 | Qrt 4 | Wood | 17,801 | 4,351 |
| 12/31/2014 | Qrt 4 | Residual Oil | - | - |
| 12/31/2014 | Qrt 4 | Coal | 1,249 | 313 |

^a Tracked beginning first quarter of 2013

Appendix D: NYS RGGI Auction Proceeds

Table D-1. NYS RGGI Auction Proceeds^a

| Auction Date | Control Period | Clearing Price | New York State Allowances Sold | New York State Auction Proceeds |
|------------------------------------|----------------|----------------|--------------------------------|---------------------------------|
| 12/17/2008 | First | \$3.38 | 12,422,161 | \$41,986,904 |
| 3/18/2009 | First | \$3.51 | 12,422,161 | \$43,601,785 |
| 3/18/2009 | Second | \$3.05 | 776,385 | \$2,367,974 |
| 6/17/2009 | First | \$3.23 | 11,861,849 | \$38,313,772 |
| 6/17/2009 | Second | \$2.06 | 776,385 | \$1,599,353 |
| 9/9/2009 | First | \$2.19 | 11,861,849 | \$25,977,449 |
| 9/9/2009 | Second | \$1.87 | 776,385 | \$1,451,840 |
| 12/2/2009 | First | \$2.05 | 11,861,850 | \$24,316,793 |
| 12/2/2009 | Second | \$1.86 | 571,423 | \$1,062,847 |
| 3/10/2010 | First | \$2.07 | 15,136,022 | \$31,331,566 |
| 3/10/2010 | Second | \$1.86 | 740,167 | \$1,376,711 |
| 6/9/2010 | First | \$1.88 | 15,136,022 | \$28,455,721 |
| 6/9/2010 | Second | \$1.86 | 756,801 | \$1,407,650 |
| 9/8/2010 | First | \$1.86 | 11,421,736 | \$21,244,429 |
| 9/8/2010 | Second | \$1.86 | 464,418 | \$863,817 |
| 12/1/2010 | First | \$1.86 | 8,678,724 | \$16,142,427 |
| 12/1/2010 | Second | \$1.86 | 414,863 | \$771,645 |
| 3/9/2011 | First | \$1.89 | 15,153,524 | \$28,640,160 |
| 3/9/2011 | Second | \$1.89 | 757,676 | \$1,432,008 |
| 6/8/2011 | First | \$1.89 | 4,519,648 | \$8,542,135 |
| 6/8/2011 | Second | \$1.89 | 383,114 | \$724,085 |
| 9/7/2011 | First | \$1.89 | 2,689,151 | \$5,082,495 |
| 12/7/2011 | First | \$1.89 | 9,621,954 | \$18,185,493 |
| 3/14/2012 | Second | \$1.93 | 8,895,733 | \$17,168,765 |
| 6/6/2012 | Second | \$1.93 | 8,265,426 | \$15,952,272 |
| 9/5/2012 | Second | \$1.93 | 9,315,659 | \$17,979,222 |
| 12/5/2012 | Second | \$1.93 | 7,568,550 | \$14,607,302 |
| 3/13/2013 | Second | \$2.80 | 14,252,818 | \$39,907,890 |
| 6/5/2013 | First | \$3.21 | 750,000 | \$2,407,500 |
| 6/5/2013 | Second | \$3.20 | 14,252,818 | \$45,751,546 |
| 9/4/2013 | First | \$3.21 | 769,253 | \$2,053,906 |
| 9/4/2013 | Second | \$3.20 | 14,578,296 | \$38,924,050 |
| 12/4/2013 | Second | \$3.00 | 14,578,295 | \$43,734,885 |
| 3/5/2014 | Second | \$4.00 | 9,119,837 | \$36,479,348 |
| 6/4/2014 | Second | \$5.02 | 7,173,198 | \$36,009,454 |
| 9/3/2014 | Second | \$4.88 | 7,173,198 | \$35,005,206 |
| 12/3/2014 | Second | \$5.21 | 7,173,198 | \$37,372,362 |
| First Control Period Total | | | 144,305,904 | \$336,282,535 |
| Second Control Period Total | | | 128,764,643 | \$391,950,232 |
| TOTAL | | | 273,070,547 | \$728,232,767 |

^a New York did not offer allowances for sale in the RGGI auction held on December 25, 2008, where the clearing price for 2009 vintage allowances was \$3.07. The first control period for fossil-fuel fired electric generators took effect on January 1, 2009 and concluded on December 31, 2011. The second control period took effect on January 1, 2012 and extends through December 31, 2014

Appendix E: Total NYS RGGI Funds

Table E-1. NYS RGGI Funds

| Quarter End Date | Quarter | Fund Category | Cumulative Funds (\$) |
|------------------|---------|--|-----------------------|
| 9/30/2010 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$940,276 |
| 9/30/2010 | Qrt 3 | RGGI Auction Proceeds | \$265,358,611 |
| 12/31/2010 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$940,276 |
| 12/31/2010 | Qrt 4 | RGGI Auction Proceeds | \$282,272,683 |
| 3/31/2011 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$940,276 |
| 3/31/2011 | Qrt 1 | RGGI Auction Proceeds | \$312,344,851 |
| 6/30/2011 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$1,034,063 |
| 6/30/2011 | Qrt 2 | RGGI Auction Proceeds | \$321,611,071 |
| 9/30/2011 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$1,034,063 |
| 9/30/2011 | Qrt 3 | RGGI Auction Proceeds | \$326,693,566 |
| 12/31/2011 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$1,034,063 |
| 12/31/2011 | Qrt 4 | RGGI Auction Proceeds | \$344,879,060 |
| 3/31/2012 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$1,998,557 |
| 3/31/2012 | Qrt 1 | RGGI Auction Proceeds | \$362,047,824 |
| 6/30/2012 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$1,998,557 |
| 6/30/2012 | Qrt 2 | RGGI Auction Proceeds | \$378,000,097 |
| 9/30/2012 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$1,998,557 |
| 9/30/2012 | Qrt 3 | RGGI Auction Proceeds | \$395,979,318 |
| 12/31/2012 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$3,026,525 |
| 12/31/2012 | Qrt 4 | Interest Allocated to the GJGNY Program | \$770,000 |
| 12/31/2012 | Qrt 4 | RGGI Auction Proceeds | \$410,586,620 |
| 3/31/2013 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$3,026,525 |
| 3/31/2013 | Qrt 1 | Interest Allocated to the GJGNY Program | \$770,000 |
| 3/31/2013 | Qrt 1 | RGGI Auction Proceeds | \$450,494,510 |
| 6/30/2013 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$3,026,525 |
| 6/30/2013 | Qrt 2 | Interest Allocated to the GJGNY Program | \$770,000 |
| 6/30/2013 | Qrt 2 | RGGI Auction Proceeds | \$498,653,556 |
| 9/30/2013 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$3,026,525 |
| 9/30/2013 | Qrt 3 | Interest Allocated to the GJGNY Program | \$770,000 |
| 9/30/2013 | Qrt 3 | RGGI Auction Proceeds | \$539,631,512 |
| 12/31/2013 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$3,026,525 |
| 12/31/2013 | Qrt 4 | Interest Allocated to the GJGNY Program | \$770,000 |
| 12/31/2013 | Qrt 4 | RGGI Auction Proceeds | \$587,162,922 |
| 3/31/2014 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$4,400,174 |

Table E-1 continued

| Quarter End Date | Quarter | Fund Category | Cumulative Funds (\$) |
|-------------------------|----------------|--|------------------------------|
| 31/2014 | Qrt 1 | Interest Allocated to the GJGNY Program | \$770,000 |
| 3/31/2014 | Qrt 1 | RGGI Auction Proceeds | \$619,845,745 |
| 6/30/2014 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$4,400,174 |
| 6/30/2014 | Qrt 2 | Interest Allocated to the GJGNY Program | \$770,000 |
| 6/30/2014 | Qrt 2 | RGGI Auction Proceeds | \$655,855,199 |
| 9/30/2014 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$4,400,174 |
| 9/30/2014 | Qrt 3 | Interest Allocated to the GJGNY Program | \$770,000 |
| 9/30/2014 | Qrt 3 | RGGI Auction Proceeds | \$690,860,405 |
| 12/31/2014 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$4,400,174 |
| 12/31/2014 | Qrt 4 | Interest Allocated to the GJGNY Program | \$770,000 |
| 12/31/2014 | Qrt 4 | RGGI Auction Proceeds | \$728,232,767 |

Appendix F: Closed RGGI-Funded Programs and Completed Evaluations

F.1 Closed Programs

F.1.1 Green Residential Buildings Program (GRBP)

The Green Residential Building Program (GRBP), established under Public Authorities Law 1872, is a market transformation initiative designed to change the building practices of the residential construction industry for single-family homes and multifamily homes with up to 11 dwelling units. The GRBP offers incentives to building owners who build and obtain certification that their newly constructed residences meet or exceed Leadership in Energy and Environmental Design (LEED[®]) or National Green Building Standard guidelines, as well as other GRBP program-specific energy efficiency and health and safety requirements. Buildings meeting GRBP requirements will help to reduce energy use and greenhouse gas emissions, save water and other natural resources, use sustainable building materials, reduce waste, and improve indoor air quality. In this program, 69 contractors participate. Per the enabling law, applications had to be received by October 31, 2013; therefore, the program is now closed to new applications. The following data represent only those projects where the incentive was funded by RGGI, which represents 82 percent of the program activity.

Key accomplishments:

- 440 RGGI-funded projects were completed.

F.2 Completed Evaluations

F.2.1 Green Jobs-Green New York Jobs Quantification Study

This study quantified the direct, indirect, and induced jobs created/retained from the GJGNY program, including those in disadvantaged communities. The study also examined changes in worker skill level and wages resulting from GJGNY. NYSERDA issued the final reports for both phases of the study in November 2013. Both Phase 1 and Phase 2 reports are posted on NYSERDA's website.¹¹

¹¹ The GJGNY jobs quantification studies, Phase 1 and Phase 2, are on NYSERDA's website: <http://www.nysERDA.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/NYES-Evaluation-Contractor-Reports/2013-Reports/NMR-Group.aspx>.

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 reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

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State of New York
Andrew M. Cuomo, Governor

New York's Regional Greenhouse Gas Initiative-Funded Programs Annual Status Report

Quarter Ending December 31, 2014

Final Report
April 2015

New York State Energy Research and Development Authority
Richard L. Kauffman, Chair | John B. Rhodes, President and CEO

