



NYSERDA

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

Quarter Ending September 30, 2017

Final Report

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.

**New York's Regional Greenhouse Gas Initiative-
Funded Programs Status Report
Quarter Ending September 30, 2017**

Final Report

Prepared by:

New York State Energy Research and Development Authority

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Acronyms and Abbreviations

| | |
|-------------------|--|
| CBO | constituency-based organization |
| CGC | Cleaner, Greener Communities |
| CO ₂ | carbon dioxide |
| CO ₂ e | carbon dioxide equivalents |
| EEPS | Energy Efficiency Portfolio Standard |
| EPA | U.S. Environmental Protection Agency |
| 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 |
| NYSERDA | New York State Energy Research and Development Authority |
| OBR | On-Bill Recovery Financing Program |
| PON | Program Opportunity Notice |
| RFP | request for proposals |
| RGGI | Regional Greenhouse Gas Initiative |
| RPS | Renewable Portfolio Standard |
| SBC | System Benefits Charge |

1 Introduction

In New York State, the Regional Greenhouse Gas Initiative (RGGI) program has been implemented through two complementary regulations: The New York State Department of Environmental Conservation (DEC) established the State's Carbon Dioxide (CO₂) Budget Trading Program (6 NYCRR Part 242, 6 NYCRR Part 200, General Provisions), and the New York State Energy Research and Development Authority (NYSERDA) established the CO₂ Allowance Auction Program (21 NYCRR Part 507). This report is prepared pursuant to the State's RGGI Investment Plan (2015 Operating Plan) and provides an update on the progress of programs through the quarter ending September 30, 2017. 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 2015 version of the Operating Plan was approved by NYSEDA's Board on June 18, 2015.

The 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- to zero-emitting technologies.

2 Summary of Portfolio and Program Benefits

This section provides an overview of the expected quantifiable benefits with expended and encumbered funds through this quarter related to carbon dioxide equivalent (CO₂e) reductions, energy savings, and participant energy bill savings.¹ For more information on the methodology used to calculate CO₂e reductions and energy bill savings, see Appendix A. For a list of former program names, reference Appendix B. Appendix C shows the detailed benefit results.

The estimated cumulative annualized and expected lifetime benefits as of September 30, 2016, at the portfolio and program levels, are shown in Table 1 and Table 2, respectively.² Investment benefits are further compared by fuel type in Figure 1. NYSERDA begins tracking program benefits once project installation is complete and provides estimated benefits for projects under contract that are not yet operational (pipeline benefits). Estimated benefits are based on the expected lifetime benefits from installed and pipeline savings. The metrics presented in this section are estimates and are not evaluated unless otherwise noted on Table 2. Future Evaluation and Status Reports will present the evaluation results as they are available. Program benefits are reported prior to the financial reporting of funds spent as fund transfers may lag behind the installation date. At this time, the program benefits include projects that are jointly 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 September 30, 2017.

Key observations during this quarter

- Electric energy efficiency comprised 49% of energy savings, 46% of emission reductions, and 45% of participant bill savings.

¹ These metrics represent the benefits that can be discretely counted at this time and are typically associated with traditional deployment programs. These programs include Green Jobs - Green New York, Residential Efficiency Services, NY-Sun, Renewable Heat NY, and LIPA Efficiency and Renewable Energy. These metrics do not reflect emission reductions, participant bill savings, and other possible benefits resulting from non-deployment programs such as Transportation Research and Cleaner, Greener Communities. Therefore, the benefits associated with the overall RGGI portfolio are anticipated to be greater than the subset of programs represented here.

² 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 effective useful lifetime of the measures associated with 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 electric generation comprised 24% of energy savings, 23% of emission reductions, and 24% of participant bill savings.
- Energy savings from electric energy efficiency and renewable electric generation are a larger percentage than the emissions reductions and participant bill savings because the emission factor and bill savings for the State's electric grid is cleaner and cheaper than other energy types such as distillate #2 oil.
- Distillate #2 oil comprised 14% of energy savings, 16% of emission reductions, and 19% of participant bill savings. Distillate #2 oil achieves a larger share of the emission reductions and participant bill savings than other fuel types because distillate #2 oil is dirtier and more expensive than other energy types such as electricity.
- Residual #6 oil comprised 14% of energy savings, 13% of emission reductions, and 10% of participant bill savings. Residual #6 oil achieves a larger share of the emission reductions and a smaller share of participant bill savings than other fuel types because residual #6 oil is dirtier, but less expensive than other energy types such as electricity.
- Due to fuel-switching, natural gas use comprised -3% of energy savings, -2% of emission reductions, and less than 1% of participant bill savings. Fuel switching projects that save the dirtier and more expensive distillate or residual oil by consuming more of the cleaner and less expensive natural gas.
- Other fuels (including propane, steam, wood, kerosene, and coal) comprised 1% of energy savings, 1% of emission reductions, and 1% of participant 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 September 30, 2017

| Benefits through September 30, 2017 ^a | Net Greenhouse Gas Emission Savings ^b (Tons CO ₂ e ^c) | Total Net Fuel Savings (MMBtu) | Net Efficiency Electricity Savings (MWh) | Net Renewable Energy Generation (MWh) | Total Net Electricity Savings/Generation (MWh) | Energy Bill Savings to Participating Customers (\$ Million) |
|--|---|--------------------------------|--|---------------------------------------|--|---|
| Cumulative Annualized Installed Savings^d | 818,343 | 2,910,280 | 606,696 | 304,616 | 911,312 | \$224.5 |
| Cumulative Annualized Pipeline Savings^e | 86,458 | 654,585 | 49,242 | 18,894 | 68,136 | \$19.4 |
| Cumulative Annualized Committed Savings^f | 904,801 | 3,564,865 | 655,938 | 323,510 | 979,447 | \$243.9 |
| Expected Lifetime Total Savings^g | 16,593,411 | 66,749,097 | 11,053,655 | 7,120,260 | 18,173,915 | \$4,752.1 |

- ^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, NY-Sun Program or Renewable Heat NY 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-user 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 September 30, 2017

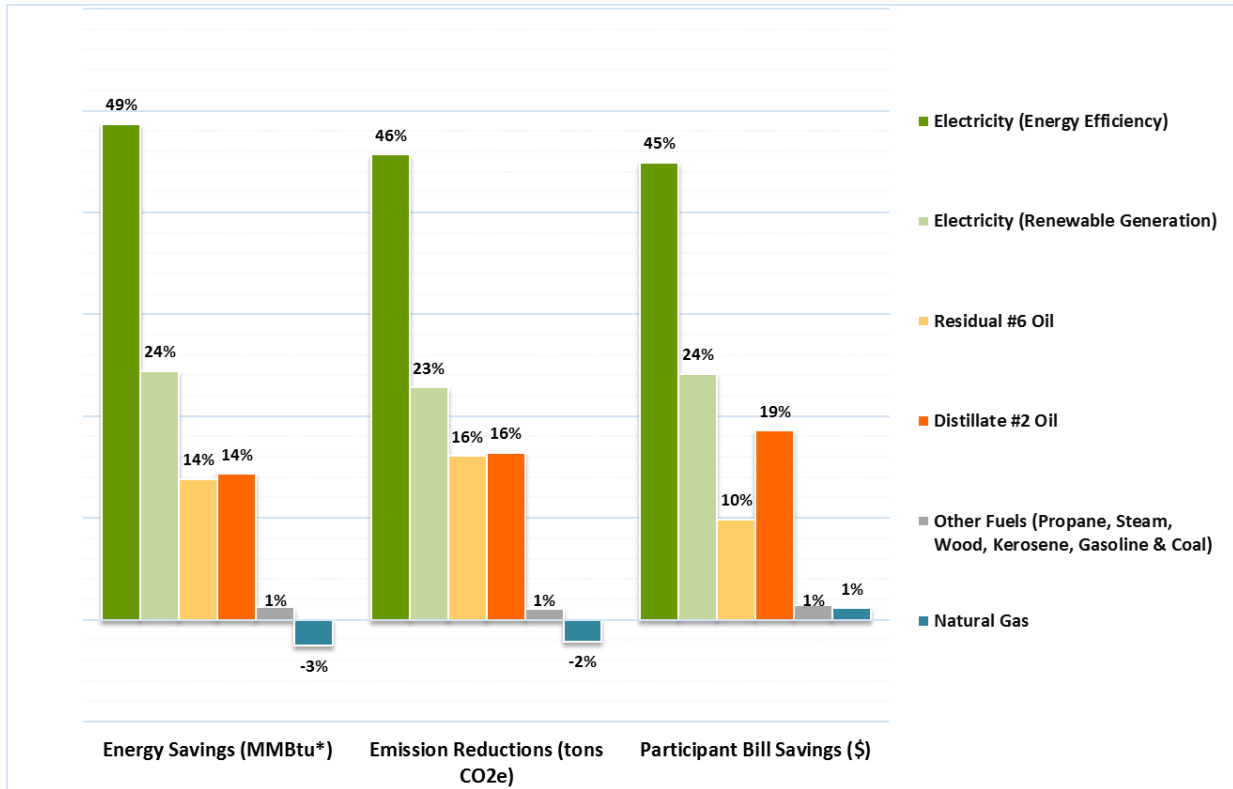
| Program | Costs (millions of dollars) | | Net Energy Savings (Annualized MMBtu) | | | Cost Benefit Ratio (\$/MMBtu) | | Net Electricity Savings or Renewable Energy Generation (Annualized MWh) | | | Cost Benefit Ratio (\$/MWh) | | Net Greenhouse Gas Emission Savings ^a (Annualized Tons CO ₂ e ^b) | | | Cost Benefit Ratio (\$/Ton CO ₂ e) | |
|--|----------------------------------|---|--|----------------------------------|--|----------------------------------|--|---|----------------------------------|--|--------------------------------|--|--|----------------------------------|--|---|--|
| | 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 ^g | Pipeline Savings ^f | Total Committed Savings ^g | \$/MWh Savings ^h | \$/MWh EXPECTED LIFETIME Savings ⁱ | Installed Savings ^g | Pipeline Savings ^f | Total Committed Savings ^g | \$/Ton CO ₂ e Savings ^h | \$/CO ₂ e EXPECTED LIFETIME Savings ⁱ |
| Green Jobs - Green New York | | | | | | | | | | | | | | | | | |
| One- to Four-Family Residential Buildings Program Assessments ^j | \$26.1 | \$1.0 | 989,806 | - | 989,806 | 27 | 1 | 12,585 | - | 12,585 | 2,150 | 119 | 78,489 | - | 78,489 | 345 | 15 |
| One-to Four-Family Residential Buildings Program Financing ^k | \$120.6 | \$15.8 | 636,815 | 17,554 | 654,369 | 208 | 9 | 79,801 | 4,198 | 83,999 | 1,624 | 85 | 92,437 | 3,692 | 96,129 | 1,419 | 68 |
| Multifamily Performance Program Assessments ^l | \$3.3 | \$1.4 | 769,668 | 68,818 | 838,486 | 6 | 0.4 | 51,478 | 1,551 | 53,029 | 89 | 7 | 79,224 | 4,932 | 84,157 | 56 | 4 |
| Small Commercial Energy Efficiency Program Financing ^l | \$1.6 | \$0.3 | 7,217 | - | 7,217 | 255 | 12 | 791 | - | 791 | 2,327 | 179 | 906 | - | 906 | 2,030 | 120 |
| Energy Efficiency | | | | | | | | | | | | | | | | | |
| LIPA Energy Efficiency and Renewable Energy Initiative | \$153.7 | - | - | - | - | - | - | 437,473 | - | 437,473 | 351 | 19 | 253,734 | - | 253,734 | 606 | 33 |
| Multifamily Performance Program ^k | \$14.5 | \$2.0 | 434,121 | 434,121 | 868,242 | 19 | 1 | 19,228 | 19,228 | 38,456 | 430 | 33 | 42,170 | 42,170 | 84,340 | 196 | 13 |
| Multifamily Carbon Emissions Reduction Program ^{l,m} | \$5.7 | \$0.2 | - | - | - | - | - | - | - | - | - | - | 45,151 | - | 45,151 | 129 | 10 |
| Empower New York | \$25.3 | \$1.7 | 152,402 | 550 | 152,952 | 177 | 7 | - | - | - | - | - | 11,214 | 43 | 11,257 | 2,402 | 100 |
| Home Performance with ENERGY STAR [®] | \$21.1 | \$2.7 | 326,196 | 946 | 327,142 | 73 | 3 | 1,792 | 2 | 1,795 | 13,244 | 736 | 27,154 | 75 | 27,229 | 873 | 37 |
| Green Residential Building Program | \$2.5 | \$0.3 | 36,548 | - | 36,548 | 75 | 3 | 1,573 | - | 1,573 | 1,744 | 97 | 3,084 | - | 3,084 | 890 | 40 |
| Solar Hot Water (Thermal) Program | \$4.2 | \$0.1 | 14,217 | 299 | 14,515 | 297 | 15 | 22 | 0 | 22 | - | 9,806 | 1,057 | 22 | 1,080 | 3,998 | 200 |
| Low-Rise Residential New Construction Program ⁿ | \$0.8 | - | 8,874 | 1,862 | 10,736 | 79 | 3 | - | - | - | - | - | 604 | 127 | 731 | 1,155 | 48 |
| Renewable Energy | | | | | | | | | | | | | | | | | |
| Renewable Heat New York | \$8.8 | \$1.21 | 3,725 | 209 | 3,934 | 2,539 | 127 | 597 | 21 | 618 | 16,158 | 808 | 1,852 | 73 | 1,925 | 5,188 | 259 |
| NY-Sun Initiative | \$50.3 | \$0.97 | - | - | - | - | - | 179,692 | 16,412 | 196,104 | 262 | 10 | 104,221 | 9,519 | 113,740 | 451 | 18 |
| NYSERDA Solar Electric | \$5.2 | \$0.1 | - | - | - | - | - | 2,040 | - | 2,040 | 2,607 | 104 | 1,183 | - | 1,183 | 4,495 | 180 |
| Community Clean Energy | | | | | | | | | | | | | | | | | |
| Regional Economic Development & GHG Reduction ^o | \$0.8 | \$8.7 | -82,448 | 5,502 | -76,946 | -124 | -7 | - | 3,735 | 3,735 | 2,549 | 142 | 35,140 | 2,490 | 37,630 | 253 | 14 |
| Clean Energy Communities | \$9.0 | - | 374,385 | - | 374,385 | 24 | 2 | 163,368 | - | 163,368 | 55 | 4 | 118,308 | - | 118,308 | 76 | 5 |
| Innovative GHG Abatement Strategies | | | | | | | | | | | | | | | | | |
| Charge NY | \$1.1 | \$0.7 | 41,207 | - | 41,207 | 43 | 4 | -2,502 | - | -2,502 | - | - | 1,804 | - | 1,804 | 987 | 55 |
| Clean Energy Fund | | | | | | | | | | | | | | | | | |
| Clean Energy Fund ^p | \$9.2 | \$2.04 | 26,019 | 210,238 | 236,257 | 48 | 3 | 1,960 | 27,209 | 29,169 | 387 | 23 | 2,504 | 31,954 | 34,458 | 327 | 20 |
| Cross-Program Overlap ^q | N/A | N/A | -828,469 | -85,515 | -913,984 | N/A | N/A | -38,586 | -4,221 | -42,807 | N/A | N/A | -83,346 | -8,639 | -91,985 | N/A | N/A |
| TOTAL Annualized Cumulative Benefits^r | \$463.6 | \$39.2 | 2,910,280 | 654,585 | 3,564,865 | 141 | N/A | 913,814 | 68,136 | 981,950 | 512 | N/A | 816,892 | 86,458 | 903,350 | 557 | N/A |
| TOTAL Expected Lifetime Cumulative Benefits^s | \$463.6 | \$39.2 | 56,470,477 | 10,278,620 | 66,749,097 | N/A | 8 | 16,995,518 | 1,203,420 | 18,198,938 | N/A | 28 | 15,154,388 | 1,439,023 | 16,593,411 | N/A | 30 |

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-user 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 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. The decrease in installed MWh this quarter is due to a change in methodology from reporting the savings from measures as a result of an energy audit to only reporting the measures actually installed.
- ^k The benefits for this program have been evaluated and will be adjusted in future reports.
- ^l The Multifamily Carbon Emissions Reduction Program is a fuel-switching program and does not claim any energy or bill savings.
- ^m The benefits presented for this program have been adjusted based on results of an impact evaluation completed in October, 2015. For additional information, see the “Program Evaluation” Section (4.7), in this report.
- ⁿ The electricity savings for the Low-Rise Residential New Construction Program (LRNC) are supported with non-RGGI funding sources. Prior RGGI Status Reports erroneously included the electricity savings from the LRNC program as a RGGI-funded benefit.
- ^o The Regional Economic Development and GHG Reduction program consists of 15 unique projects. The costs for all 15 projects are included in this table although only a subset of these projects actually report quantifiable energy benefits. The negative MMBtu savings are due to a manufacturing project that switched from burning #6 residual oil to natural gas and a transportation project that switched from burning diesel fuel to compressed natural gas (CNG). CNG is slightly less efficient than diesel from an energy perspective but results in carbon emission reductions.
- ^p These figures represent a proportional allocation of benefits relative to the percent of RGGI contributions to the total approved CEF budget.
- ^q 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, NY-Sun Program or Renewable Heat NY Program.
- ^r Totals may not sum exactly due to rounding.

Figure 1. Percent Contribution by Fuel Type for Energy Savings, Emission Reductions, and Bill Savings September, 2017³



* 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 8,697 Btu/kWh, which is based on a three-year rolling average (2013, 2014, and 2015) 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%.

³ Columns may not sum exactly to 100% due to rounding.

3 Funds

3.1 Proceeds

As of September 30, 2017, NYS sold more than 339 million CO₂ allowances and received more than \$1,052 million in auction proceeds. In addition, more than \$13.1 million in interest was earned on the RGGI portfolio and nearly \$2 million in interest was earned on the Green Jobs - Green New York (GJGNY) program. More than \$13 million in interest earnings were allocated on the RGGI portfolio and nearly \$2 million in interest earnings were allocated to the GJGNY program. The allocated interest earnings are reinvested for program implementation and 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 September 30, 2017^a

Source: RGGI, Inc. and NYSEERDA

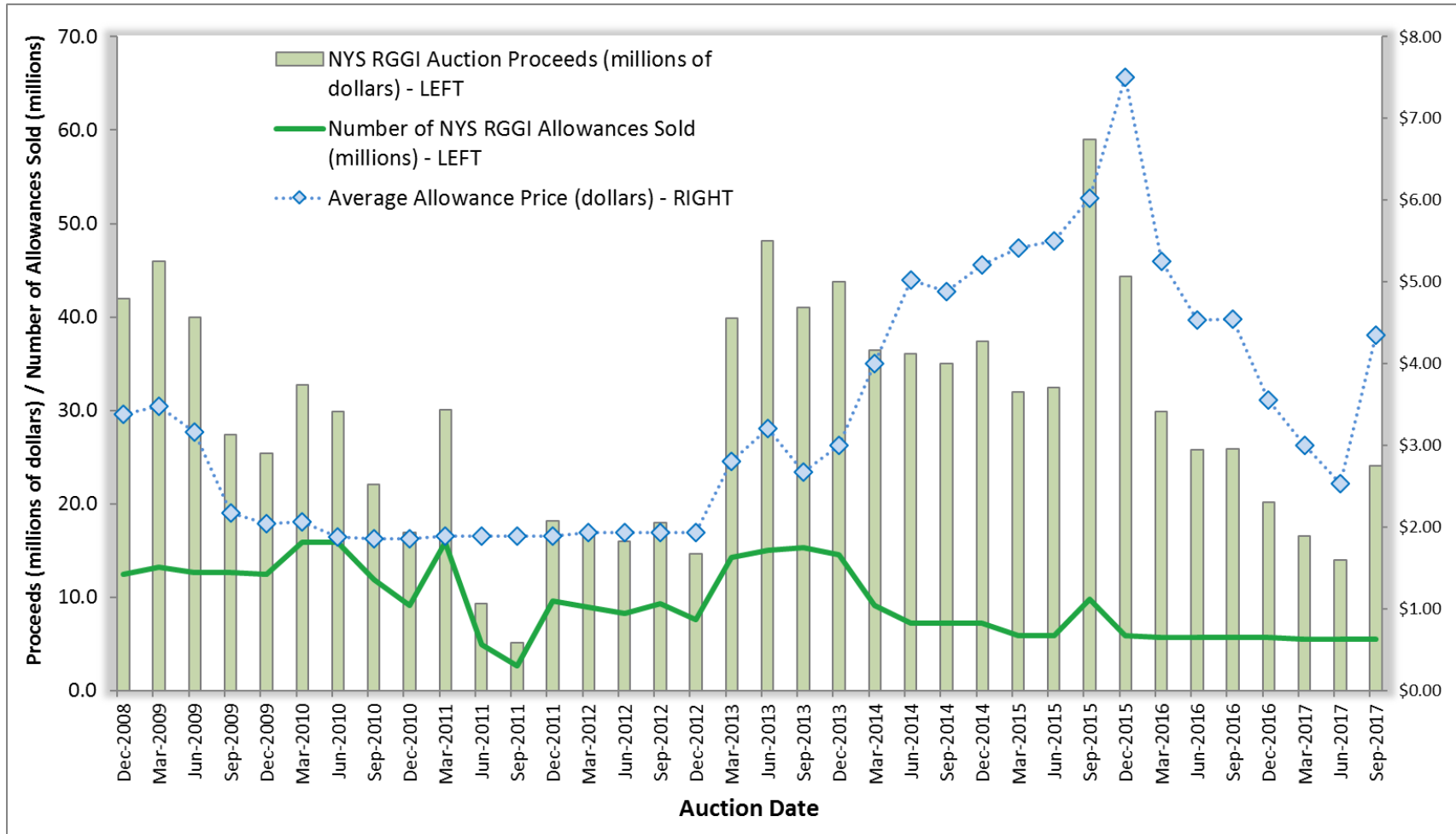
| Fund Category | NYS Allowances Sold | Cumulative Funds |
|----------------------------------|----------------------------|-------------------------|
| First Control Period Total | 144,305,904 | \$336,282,535 |
| Second Control Period Total | 128,764,643 | \$391,950,232 |
| Third Control Period Total | 66,872,560 | \$324,068,546 |
| RGGI Auction Proceeds | 339,943,107 | \$1,052,301,313 |
| RGGI Portfolio Interest Earnings | | \$13,151,561 |
| GJGNY Program Interest Earnings | | \$1,993,273 |
| TOTAL Funds^b | | \$1,067,446,147 |

^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 concluded on December 31, 2014. The third control period took effect on January 1, 2015 and extends through December 31, 2018.

^b RGGI program budgets have increased based on anticipated auction revenues from the approved FY 2017–2018 Operating Plan. These amounts have been allocated, but have not been received due to the timing of receipt of the proceeds.

Figure 2. New York State's RGGI Auction Results through September 30, 2017

Source: RGGI, Inc.



3.2 Budget

Financial data for the approved RGGI programs through September 30, 2017, are presented in Tables 4 through 6. Table 4 presents the current expended, encumbered, and committed funds for each program and reflects how more than \$1,189 million of approved funds are distributed across the eight major program areas and other costs:

- Renewable Energy
- Energy Efficiency
- Innovation GHG Abatement Strategies
- Community Clean Energy
- GJGNY
- NY Green Bank
- Clean Energy Fund
- Clean Energy Standard

Tables 5 and 6 present the financial data for the approved GJGNY program and NY Green Bank, respectively, through September 30, 2017.

Table 4. Available Funding and Financial Status through September 30, 2017 (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 | 10.3 | 7.2 | 2.5 | 0.4 | 10.1 | 0.2 |
| NY-Sun | 82.5 | 44.7 | 6.1 | 0.7 | 51.4 | 31.1 |
| NYSERDA Solar Electric Programs | 5.3 | 5.3 | 0.03 | - | 5.3 | - |
| NY Generation Attribute Tracking | 0.8 | 0.2 | 0.6 | - | 0.8 | - |
| Advanced Renewable Energy | 2.9 | 2.8 | - | - | 2.8 | 0.02 |
| Total Renewable Energy | 101.8 | 60.1 | 9.2 | 1.1 | 70.4 | 31.4 |
| Energy Efficiency | | | | | | |
| LIPA Energy Efficiency and Renewable Energy | 153.7 | 127.7 | 26.0 | - | 153.7 | - |
| Residential Efficiency Services | 82.0 | 77.2 | 3.8 | 0.5 | 81.5 | 0.5 |
| Municipal Water and Wastewater | 1.2 | 1.2 | - | - | 1.2 | - |
| Clean Energy Workforce Opportunity | 15.0 | 15.0 | - | - | 15.0 | - |
| Total Energy Efficiency | 251.9 | 221.1 | 29.8 | 0.5 | 251.4 | 0.5 |
| Innovative GHG Abatement Strategies | | | | | | |
| Industrial Innovations | 13.0 | 8.5 | 4.6 | - | 13.1 | 0.0 |
| Climate Research and Analysis | 8.7 | 7.4 | 1.0 | 0.3 | 8.7 | - |
| Clean Energy Business Development | 27.6 | 16.2 | 3.2 | 2.7 | 22.1 | 5.4 |
| Charge NY | 17.0 | 1.8 | 0.4 | - | 2.2 | 14.8 |
| Transportation Research | 3.9 | 3.0 | 0.4 | 0.5 | 3.9 | 0.0 |
| Carbon Capture and Sequestration | 1.0 | 1.0 | - | - | 1.0 | - |
| Advanced Buildings | 1.6 | 1.2 | 0.3 | - | 1.5 | 0.1 |
| Competitive Greenhouse Gas Reduction Pilot | 1.0 | 0.7 | 0.3 | - | 1.0 | - |
| Brookhaven National Laboratory Ion Collider | 25.0 | 9.2 | 15.8 | - | 25.0 | - |
| Total Innovative GHG Abatement Strategies | 98.9 | 49.1 | 26.1 | 3.5 | 78.6 | 20.3 |
| Community Clean Energy | | | | | | |
| Climate Smart Communities | 7.7 | 4.4 | 0.5 | 0.1 | 5.1 | 2.6 |
| Economic Development Growth Extension | 7.2 | 5.5 | 0.2 | 0.4 | 6.2 | 1.0 |
| Cleaner, Greener Communities | 99.1 | 39.2 | 46.7 | 13.3 | 99.1 | - |
| Clean Energy Communities | 2.8 | - | - | - | - | 2.8 |
| Regional Economic Development and Greenhouse Gas Reductions | 10.3 | 9.3 | 1.0 | - | 10.3 | 0.003 |
| REV Campus Competition | 3.0 | 0.3 | 2.7 | - | 3.0 | - |
| Total Community Clean Energy | 130.1 | 58.8 | 51.1 | 13.8 | 123.7 | 6.5 |
| Other Costs^g | | | | | | |
| Deficit Reduction Plan (DRP) Transfer ^h | 90.0 | 90.0 | - | - | 90.0 | - |
| Con Edison Smart Grid Program ⁱ | 21.9 | 21.9 | - | - | 21.9 | - |
| Program Administration ^j | 30.9 | 26.4 | 0.05 | - | 26.4 | 4.5 |
| Metrics and Evaluation | 11.8 | 4.2 | 1.5 | - | 5.7 | 6.1 |
| RGGI Inc. Costs ^k | 9.0 | 7.6 | 0.2 | 1.0 | 8.9 | 0.1 |
| New York State Cost Recovery Fee | 10.6 | 10.3 | - | - | 10.3 | 0.3 |
| Unallocated Interest Earnings | 0.20 | - | - | - | - | 0.2 |
| Environmental Tax Credit | 87.0 | 87.0 | - | - | 87.0 | - |
| Electric Generation Facility Cessation Mitigation ^m | 30.0 | 30.0 | - | - | 30.0 | - |
| OTHER COSTS TOTAL | 291.3 | 277.4 | 1.7 | 1.0 | 280.2 | 11.2 |
| SUBTOTAL | 874.0 | 666.5 | 117.9 | 19.9 | 804.3 | 69.8 |
| Green Jobs - Green New York | | | | | | |
| Green Jobs - Green New York | 205.6 | 193.8 | 1.9 | 25.0 | 220.8 | (-12.2) ^m |
| NY Green Bank | | | | | | |
| NY Green Bank | 52.9 | 51.9 | - | - | 51.9 | 1.0 |
| Clean Energy Fund | | | | | | |
| Clean Energy Fund | 56.3 | 3.9 | 1.0 | - | 4.9 | 51.3 |
| Clean Energy Standard | | | | | | |
| Clean Energy Standard | 0.7 | - | - | - | - | 0.7 |
| TOTALⁿ | 1,189.5 | 916.1 | 120.8 | 44.9 | 1,081.8 | 122.9 |

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 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 NYS 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, NYS 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 \$20.8 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 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 the 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 The Electric Generation Facility Cessation Mitigation Program was enacted in the 2015–2016 New York State Budget and is designed to support communities that are transitioning local economies reliant on fossil fuel power plants as a source of financial support. For more information see the Final 2016 RGGI Operating Plan Amendment at: <https://www.nyserdera.ny.gov/Researchers-and-Policymakers/Regional-Greenhouse-Gas-Initiative/Useful-Documents>.
- ^m The Residential Financing figures include certain loans issued, but where proceeds from bonds to finance the pledged loans is received subsequently. The Residential Financing figures also includes pre-encumbrances for approved loans not yet issued, which will be funded from additional funds to be transferred to GJGNY and not yet reflected in the budgeted funds shown in this table.
- ⁿ Totals may not sum exactly due to rounding.

Table 5. Green Jobs - Green New York Available Funding and Financial Status through September 30, 2017 (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 | 7.3 | 6.7 | 0.1 | - | 6.8 | 0.5 |
| Outreach and Marketing | 15.9 | 15.7 | 0.0 | 0.0 | 15.8 | 0.1 |
| Total Workforce Development, Outreach and Marketing | 23.2 | 22.4 | 0.1 | 0.0 | 22.6 | 0.7 |
| Residential | | | | | | |
| Energy Assessment Incentive | 26.9 | 25.8 | - | 0.3 | 26.1 | 0.8 |
| Implementation Costs | 1.0 | 1.0 | - | - | 1.0 | 0.00 |
| Financing: Loans | 112.2 | 251.9 | - | 24.0 | 275.9 | |
| Financing: Loan Repayments | - | (20.5) | - | - | (20.5) | |
| Financing: Implementation Costs | - | 13.2 | 0.3 | 0.1 | 13.6 | |
| Financing: Bond Proceeds | - | (108.2) | - | - | (108.2) | |
| Financing: Bond Issue Costs | - | 3.1 | 0.2 | 0.0 | 3.3 | |
| Financing: Short Term Note | - | (30.0) | - | - | (30.0) | |
| ESF Advance | - | 3.0 | - | - | 3.0 | |
| Total Financing | 112.2 | 109.4 | 0.5 | 24.1 | 134.0 | (-21.8)^g |
| Total Residential | 140.1 | 139.2 | 0.5 | 24.3 | 164.1 | (-21.0)^g |
| Multifamily | | | | | | |
| Energy Assessments | 3.3 | 3.1 | 0.2 | - | 3.3 | 0.0 |
| Implementation Costs | 1.4 | 1.4 | 0.0 | - | 1.4 | 0.0 |
| Financing: Loans | 3.5 | 3.9 | 0.0 | - | 3.9 | |
| Financing: Loan Repayments | - | (2.6) | - | - | (2.6) | |
| Financing: Implementation Costs | 0.3 | 0.1 | 0.1 | - | 0.3 | |
| Total Financing | 3.8 | 1.4 | 0.1 | - | 1.6 | 2.3 |
| Total Multifamily | 8.5 | 5.9 | 0.3 | - | 6.2 | 2.3 |
| Small Commercial | | | | | | |
| Energy Assessments | 8.6 | 7.0 | - | - | 7.0 | 1.6 |
| Implementation Costs | 1.0 | 0.9 | 0.0 | - | 0.9 | 0.2 |
| Financing: Loans | 3.8 | 2.1 | - | - | 2.1 | |
| Financing: Loan Repayments | - | (0.5) | - | - | (0.5) | |
| Financing: Implementation Costs | 0.3 | 0.3 | 0.2 | 0.7 | 1.2 | |
| Total Financing | 4.1 | 1.8 | 0.2 | 0.7 | 2.8 | 1.3 |
| Total Small Commercial | 13.7 | 9.8 | 0.2 | 0.7 | 10.7 | 3.0 |
| SUBTOTAL | 185.6 | 177.3 | 1.2 | 25.0 | 203.6 | (-15.0)^g |
| Other Costs | | | | | | |
| Program Administration | 11.8 | 10.9 | 0.02 | - | 10.9 | 0.8 |
| Program Evaluation | 5.6 | 3.4 | 0.6 | - | 4.0 | 1.6 |
| New York State Cost Recovery Fee | 2.5 | 2.3 | - | - | 2.3 | 0.2 |
| Unallocated Interest Earnings | 0.2 | - | - | - | - | 0.2 |
| OTHER COSTS TOTAL | 20.0 | 16.6 | 0.7 | - | 17.2 | 2.8 |
| TOTAL^h | 205.6 | 193.8 | 1.9 | 25.0 | 220.8 | (-12.2)^g |

- ^a Includes auction proceeds and allocated interest on the GJGNY funds. The allocation is consistent with the budget presented in the 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 The Residential Financing figures include certain loans issued, but where proceeds from bonds to finance the pledged loans is received subsequently. The Residential Financing figures also includes pre-encumbrances for approved loans not yet issued, which will be funded from additional funds to be transferred to GJGNY and not yet reflected in the Budgeted funds shown in this table.
- ^h Totals may not sum exactly due to rounding.

**Table 6. NY Green Bank Available Funding and Financial Status through September 30, 2017
(thousands of dollars)**

| | Budgeted Funds ^a | Deployed Funds ^b | Committed Capital ^c | Approved Investments ^d | Committed Funds ^e | Remaining Balance ^f |
|---|-----------------------------|------------------------------|--|--|------------------------------|--------------------------------|
| Program Costs | | | | | | |
| NY Green Bank | 47,567 | 47,567 | - | - | 47,567 | - |
| SUBTOTAL | 47,567 | 47,567 | - | - | 47,567 | - |
| | Budgeted Funds | Expenses ^g | Open Encumbrances ^h | Pre-Encumbrances ⁱ | Committed Funds ^j | Remaining Balance ^f |
| Other Costs | | | | | | |
| Operating Expenses (Program Administration) | 4,234 | 4,234 | - | - | 4,234 | - |
| Program Evaluation | 969 | 10 | - | - | 10 | 959 |
| New York State Cost Recovery Fee | 156 | 84 | - | - | 84 | 72 |
| OTHER COSTS TOTAL | 5,359 | 4,329 | - | - | 4,329 | 1,030 |
| | Budgeted Funds | Deployed Funds plus Expenses | Committed Capital plus Open Encumbrances | Approved Investments plus Pre-Encumbrances | Committed Funds | Remaining Balance |
| TOTAL^k | 52,926 | 51,896 | - | - | 51,896 | 1,030 |

- a The allocation is consistent with the 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 Deployed Funds means, in any period, the aggregate funds that have been advanced by NY Green Bank subject to the terms of executed investment and financing agreements which remain in force during that period, expressed in dollars. Deployed Funds reflect only funds actually advanced. Many transactions involve provision of credit enhancements by NY Green Bank that, by their nature, are contingent obligations not generally intended to be fully drawn against or funded. In addition, many NY Green Bank investments are “delayed draw” in that funds are not deployed until project sponsors meet certain development milestones over a time period necessary to originate, develop, and construct a large number of smaller, distributed, clean energy projects.
- c Committed Capital means, in any period, the aggregate funds to be provided by NY Green Bank pursuant to executed investment and financing agreements that remain in force during that period, without such funds having been deployed, expressed in dollars.
- d Approved Investments means proposed investments that have moved through NY Green Bank’s transaction process—from proposal submission, evaluation, structuring/diligence/negotiation, agreement in principle, to vetting by the IRC and approval by NYSERDA’s president and CEO after considering recommendations made by IRC members. Approved Investments represent an allocation of NY Green Bank’s capital in accordance with the terms of the IRC approval—an interim stage before “Committed Funds” or “Deployed Funds.” Once an Approved Investment has been fully negotiated and executed, it becomes “Committed” and/or “Deployed” and no longer represents a current Approved Investment. Equally, if an Approved Investment becomes dormant for any reason for a continuous period of one year prior to being fully negotiated and executed and at the end of that period the probability of that investment moving forward towards execution is regarded as low, it may also be removed from the category of Approved Investments. In that event, all capital amounts corresponding to that investment are released and available for other NY Green Bank investments.
- e The sum of Deployed Funds, Committed Capital, and Approved Investments.
- f The difference between Budgeted Funds and Committed Funds.
- g Invoices processed for payment by NYSERDA.
- h Remaining funding obligated under a contract, purchase order, or incentive award.
- i 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 transaction commitments in excess of Budgeted Funds. These commitments are expected to decrease over time due to project/transaction attrition and differences in estimated versus actual costs.
- j The sum of Expenses, Open Encumbrances and Pre-Encumbrances.
- k Totals may not sum exactly due to rounding.

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 respects, developing this market will inherently require capturing the benefits of local scale. Installation and pellet supply economics will demonstrate an economic service radius effect; workforce development and customer awareness will show gains from local density. Consequently, this initiative seeks to develop and expand clusters of activity, thereby meeting the overarching goal of supporting the high-efficiency and low-emission biomass heating industry in the State.

Renewable Heat NY 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 be sustainable in the long term. There will be a reduction in investments of incentives and staff resources as the private market develops.

Key accomplishments as of this quarter:

- Twenty-three new research projects have been contracted as a result of proposals received from PON 3027: Energy and Environmental Performance of Biomass-Fired Heating Equipment. These projects are addressing needs identified through the Renewable Heat NY program, and support the development and advancement of a high-efficiency, low-emissions biomass thermal industry in the State.
- NYSERDA's training service provider conducted one online training session this quarter. A recording of the training is being made available online. Enrollment of qualified installers is ongoing.
- The installation of seven pellet stoves; more than 13 projects are in process. Four residential pellet boiler installations completed; five residential cordwood boiler installations are in process.
- Ongoing feasibility studies and reviews by technical consultants related to development of large commercial projects. Three large commercial pellet boiler projects are in-process.

4.1.2 NY-Sun Initiative

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

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

Key accomplishments as of this quarter:

- Twenty-four Solarize campaigns have been hosted throughout the state. Solarize campaigns currently underway will close by the end of the calendar year, with the exception of the CEG SolarGen campaign, which focuses on commercial and manufacturing buildings. Statewide uptake for the Affordable Solar Residential Onsite program, which provides additional incentives for on-site residential projects for low- to moderate-income homeowners, increased for customers and contractors during the third quarter of 2017. Additionally, nine installations have been completed in Long Island with RGGI funding.
- The Affordable Solar Predevelopment and Technical Assistance program, which provides funding to support the development of community solar projects serving low and moderate-income households as well as solar serving multifamily affordable housing properties, approved eight project applications through, with three predevelopment projects under contract statewide. Of these, one contracted predevelopment project is located in Long Island and funded by RGGI.
 - Due to the continued growth of the Long Island residential solar market, the final residential MW Block for that region filled in April 2016 and the incentive program closed. A total of 19,268 solar electric systems were installed through September 30, 2017 on Long Island through PON 2112 and the Solar Pioneer Programs.

4.1.2.1 NYSERDA Solar Electric Program

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

Key accomplishments as of this quarter:

- There were 199 solar electric system installations outside of Long Island using RGGI funding through September 30, 2017.

4.1.3 New York Generation Attribute Tracking (NYGATS)

NYSERDA established the New York Generation Attribute Tracking System (NYGATS) to record electricity generation attribute information within NYS, and process generation attribute information from energy imported and consumed within the State, as a basis for creating tradable generation attribute certificates. Through NYGATS, entities are able to verify and substantiate ownership of renewable energy certificates to either support regulatory compliance, to validate environmental attributes in trading markets, or to substantiate the fulfillment and verification of voluntary green market product claims. NYGATS also characterizes the attributes of electricity imports and exports and has the capability to interface and exchange information with other certificate tracking systems. The system is used for the

creation of annual disclosure labels for New York Load Serving Entities (LSE) under the Environmental Disclosure Program (EDP), for generation projects to apply for eligibility under Tier 1 of the Clean Energy Standard (CES), for LSEs to substantiate compliance under the CES, and for CES progress reporting. Additionally, NYGATS certificates are the instrument received by the utilities in exchange for providing the environmental value component of the Value of Distributed Energy Resources (VDER) Phase 1 Value Stack tariff. As previously ordered by the Public Service Commission, this project is also supported with System Benefits Charge (SBC) environmental disclosure program funding.

Key accomplishments as of this quarter:

- In July 2017, NYGATS was utilized to support the first NYSERDA procurement of Tier 1 RECs under the Renewable Energy Standard (RES) component of the CES. Prospective applicants to the procurement were required to have their renewable generation projects certified as eligible under the Tier 1 certification process in NYGATS in order to submit a proposal. Additionally, NYGATS data was integrated into the Step One Application process of the RES procurement; this data is used in the evaluation of submitted proposals. This creates consistency and standardization across the NYGATS project data, the RES Tier 1 certification data, and the RES procurement project data.
- In September the North American Renewables Registry (NAR) demonstrated the requisite standards of security and integrity of the certificate information and reciprocity of conversion to be designated as a compatible tracking system by NYGATS. NAR is the tracking system utilized by generators in control areas that do not have a tracking system, most notably the Canadian provinces. Having NAR as a compatible tracking system provides assurances that Canadian certificates imported into NYGATS have been properly retired in Canada and, therefore, cannot be double counted.
- Also in this quarter, NYSERDA and DPS commenced work on the first settlement process for NYGATS. This settlement process will generate EDP labels for 2016 using NYGATS data. Extensive stakeholder outreach was completed to NYGATS Account Holders and LSEs in preparation for the execution of 2016 settlement. NYGATS will automate the process of creating EDP labels and eliminate the need for Conversion Transaction reporting by LSEs. NYSERDA and DPS are currently undertaking extensive testing of the settlement process, which includes data quality reviews and refinements to the process.
- Modifications to NYGATS to support the CES and VDER are in development and are being released throughout 2017.

4.1.4 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 as of this quarter:

- GridMarket, LLC completed conducting a small research project to analyze the characteristics of building load profiles using 15-minute interval meter data in the Con Edison distribution area and evaluating the potential benefits to customers and the grid of applying energy storage technologies to modify load and integrate with renewable generation. The final report has been received by NYSERDA.
- An Offshore Wind Cost Benefit Study was completed. It assessed the potential costs, ratepayer impacts, environmental benefits, economic benefits and impacts (job and other macroeconomic impacts) to New York State associated with plausible scenarios of future offshore wind energy deployment in the New York Bight through 2025.
- The Offshore Wind Master Plan, that is funded through the Clean Energy Fund, will include cost studies that build on the work completed for the Offshore Wind Cost Benefit Study.

4.2 Energy Efficiency

4.2.1 LIPA Energy Efficiency and Renewable Energy Initiative

The RGGI funds provided to LIPA ensure businesses and consumers on Long Island have access to similar clean energy and energy efficiency opportunities available throughout the State and to help advance efforts toward achieving the goals of the 2015 New York State Energy Plan. The funds provided to LIPA traditionally supported solar incentive programs consistent with the statewide NY-Sun program, but more recently supported energy efficiency programs administered by PSEG Long Island. During 2016, LIPA, NYSERDA, and PSEGLI collaborated to launch new approaches envisioned under REV to support market transformation objectives while also achieving greater carbon emissions reductions. Funding and reporting requirements are established through a Memorandum of Understanding (MOU) between NYSERDA and LIPA.

Cumulative Q1 2017 rebate spending totaled \$8.65 million against total budgeted RGGI funds of \$34.6 million, resulting in 49,271 MWh savings. The majority of the spending (\$5.1 million) consisted of payments to businesses through PSEGLI's Commercial Efficiency Program (CEP). Residential programs supported include PSEGLI's Cool Homes central air conditioner program and PSEGLI's Efficient Products program, which includes support of LED light bulbs, pool pumps, and recycling refrigerators and portable air conditioners.

Key accomplishments as of this quarter:

- In Q1 2017 over \$5.1 million in rebates were paid to Long Island businesses saving 20,159 MWh as part of PSEGLI's CEP as incentive for over 1,100 energy efficiency projects installing measures such as lighting, HVAC systems and efficient motors.
- PSEGLI residential customers were provided with incentives of over \$800,000 to install 730 energy-efficient central air conditioning projects as part of PSEGLI's Cool Homes program in Q1 2017, saving 622 MWh annually.
- In Q1 2017 the PSEGLI Residential Efficient Products program resulted in annual savings of 28,053 MWh for total incentive payments of \$2.45 million, including rebates of \$2.1 million to PSEGLI residential customers for the purchase of more than 1 million light bulbs. The remaining incentives were paid for efficient product measures such as LED light bulbs, pool pumps, and recycling refrigerators and portable air conditioners.

4.2.2 Residential Efficiency Services

NYSERDA currently offers a suite of programs that provide comprehensive energy efficiency services for single and multifamily existing buildings and new construction, including low-income households. In addition to energy savings, these programs provide significant health and safety benefits through comprehensive testing and verification, improved air quality, and improved comfort. Previously, RGGI funds were used to fill gaps in residential energy efficiency services, offering incentives to implement energy efficiency measures related to petroleum fuel opportunities, or opportunities on Long Island and municipal electric districts, which were not supported through the Energy Efficiency Portfolio Standard (EEPS). However, the Clean Energy Fund initiatives are fuel neutral, and the Long Island Power Authority now administers more comprehensive residential energy efficiency programs; therefore, RGGI funds are used to support petroleum fuel opportunities for customers of municipal electric utilities. Coordination of RGGI funds with programs offered by municipal electric utilities 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 as of this quarter:

- Through September 30, 2017, 146 energy efficiency projects were completed, representing efficiency upgrades to 33,227 housing units.

4.2.2.2 Multifamily Carbon Emission Reduction Program

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

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. On-site energy education offers customers additional strategies for managing their energy costs. Services are provided by participating contractors that are Building Performance Institute GoldStar Contractors. Currently, 159 EmPower contractors are assisting in RGGI-funded projects.

Historically, EmPower used RGGI funding to serve low-income applicants that heat with oil and propane and were ineligible for EEPS funding. Currently, RGGI funds continue to support petroleum fuel efficiency measures in households served by municipal electric utilities. These energy efficiency measures aid in the reduction of GHG emissions and provide long-term carbon reductions.

Key accomplishments as of this quarter:

- Across the State, 39 households were served during this quarter, bringing the total to 6,926 households served under EmPower New York to date with RGGI funding through September 30, 2017.

4.2.2.4 Green Residential Buildings Program

This program is now closed. For more information, refer to Appendix F: Closed RGGI-Funded and Completed Evaluations.

4.2.2.5 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-rise⁴ residential buildings. The program uses a network of 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. As of September 30, 2017, 180 contractors are active in HPwES.

The program uses RGGI funds for municipal electric households for oil and propane efficiency measures, such as replacing inefficient oil and propane heating equipment, air sealing, and insulation, and other measures that have a direct impact on reducing GHG emissions from oil and propane consumption. Income-qualified homeowners are eligible for incentives to make energy improvements. HPwES applicants may also qualify for GJGNY assessment and financing programs.

Key accomplishments as of this quarter:

- During this quarter 36 energy efficiency projects were completed at a contracted value of \$334.2 thousand, bringing the total to 9,349 energy efficiency projects completed at a contracted value of \$91.2 million.
- Of these projects, 36% were Assisted HPwES, which serves homeowners with incomes less than 80% of area median income.
- In Q3 2017, 2% of all HPwES projects were RGGI funded.

4.2.2.6 Solar Thermal Incentive Program

NYSERDA's Solar Thermal Incentive Program incentivizes the installation of solar thermal technologies for the production of hot water to displace electric heated hot water systems. Approximately 100 contractors participate in this program. Accounting for funding from the RPS program to displace electrically heated domestic hot water, RGGI support for the Solar Thermal Incentive Program to use heating fuels other than electricity. GJGNY financing is also available for these projects.

⁴ 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.

The revised program, released on March 20, 2015, provides cash incentives for the installation of new solar thermal (hot water) systems by an eligible installer or contractor. Incentives are available on a first-come, first-served basis. Incentives are applied to the total project cost based on displaced kWh. The program allows combination systems (systems that provide domestic hot water and space heating); however, incentives are only provided on the portion of the solar thermal system output that offsets hot water production.

Key accomplishments as of this quarter:

- Program funds are winding down; no new solar thermal hot water system was installed during this quarter. Five funded projects remain in the existing program, potentially adding 816 MMBtu's.
- In total, 13,753 MMBtu's have been saved through 177 projects and their solar thermal contribution to domestic hot water.⁵

4.2.2.7 Low-rise Residential New Construction Program

NYSERDA's Low-rise Residential New Construction Program⁶ (LRNCP) includes the New York ENERGY STAR Certified Homes Program and the New York Energy \$mart designation for certain low-rise, multi-unit buildings and gut rehabilitation projects. Funded primarily through the Energy Efficiency Portfolio Standard, this program is 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. Starting in July 2013, RGGI funded the MMBtu-savings component of the LRNCP incentive for projects using propane or oil as the primary heating fuel. Although more than 165 builders participate in this program statewide, 24 builders have constructed homes eligible for RGGI incentives so far. RGGI funds have been fully committed as of Q3, 2015.

Key accomplishments as of this quarter:

- The cumulative total of new dwelling units constructed to date remains 262, with no new dwelling units added in this quarter.
- The total private sector funds leveraged to date is \$1,038,718.

⁵ Installed MMBtu's decreased from prior period due to lagged data and/or QA/QC.

⁶ Low-rise residential new construction is a dwelling unit(s) contained within residential buildings of not more than three stories in height. Additionally, residential buildings that are more than three stories in height and determined to be eligible to participate in the EPA's ENERGY STAR[®] Certified Homes program are considered for eligibility on a case-by-case basis. Dwelling units "gut-rehabbed" or fully rehabilitated are also considered by NYSERDA for eligibility on a case-by-case basis.

4.2.3 Municipal Water and Wastewater Program

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

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

In 2014, two Manufacturing Innovations solicitations were issued: 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.

Key accomplishments as of this quarter:

- A project with SulfCrete of Long Beach, NY, has received federal funding from DOE this quarter. The DOE award, \$750,000, will support the involvement of Brookhaven National Labs for the commercial scale-up and demonstration of SulfCrete, a clean, energy efficient alternative to conventional Portland cement concrete.
- Projects in progress from previous quarters continued to make advancements during this quarter.

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 as of this quarter:

- Work continued on the climate change adaptation research projects. Several projects are expected to be completed by the end of this year.
- Through the Community Risk and Resiliency Act (CRRA) process, the DEC previously adopted the NYSERDA-supported ClimAID projections as the official sea level rise projections for the State. NYSERDA staff continued to participate in an interagency working group to coordinate efforts on CRRA. NYSERDA will continue to engage with this group, offering suggestions and support when appropriate.
- The New York Climate Change Science Clearinghouse launched in early May 2016. This quarter, the Northeast States for Coordinated Air Use Management (NESCAUM) and the team continued to work with neighboring states interested in building off the New York site, including having initial discussions with the U.S. Climate Alliance on building a clearinghouse for that national entity based on the New York site.

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 leverage private investment in early-stage and growth-stage clean energy companies in NYS 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.
- Developing and supporting a portfolio of programs designed to translate clean energy technology research into commercially viable business enterprises.

As part of the effort to bring private investment to early-stage clean energy companies in NYS, NYSERDA is working with the impact investment group, Investors' Circle to develop a local network in New York City, which has been branded as Investors' Circle New York (IC NY). The group held

monthly meetings/events to bring together the impact/social investing community in the New York metropolitan area, introduce clean energy investment opportunities to IC NY members, and provide feedback to the clean energy companies on how to successfully pitch to the impact/social investing community. IC NY is working to form and grow an effective and sustainable local network that will foster early-stage and growth-stage impact/social investments in clean energy companies in NYS. Additionally, IC NY worked to create stronger ties to key segments of the impact/social investor community, including foundations, family offices, sovereign wealth funds, and high-net-worth individuals.

Energy storage is an enabling technology important to the market penetration and value of intermittent renewable energy resources such as solar and wind. Financial support for the New York Battery and Energy Storage Technology Consortium (NY-BEST) Test and Commercialization Center in Rochester is partially provided by RGGI. The Center is a wholly owned subsidiary of NY-BEST and operated by DNV GL. The lab's grand opening occurred on April 30, 2014 and conducted the first test on May 28, 2014. In addition, in March 2015, the BTCC received American Association for Laboratory Accreditation for International Organization for Standardization (ISO) 17025 Lab Quality.

76West is an initiative focused on clean energy business development in the Southern Tier. As outlined in the 2015 State of the State address, this \$20 million investment will catalyze a clean energy business cluster that builds on the local strengths and assets of the Southern Tier.

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 as of this quarter:

- Investors' Circle New York held monthly meetings for the impact/social investment community in metropolitan New York.
- The second round of the 76West Clean Energy Business Competition was launched on December 1, 2016 and applications were due on March 13, 2017. The semifinals of the competition were held on July 11, 2017 in Alfred, NY and the finals were held on July 13, 2017 in Corning, NY. The winners were announced at an awards ceremony on August 16, 2017 in Binghamton, NY. The agreements with the winners are currently being negotiated and finalized.

Success Story 1: New York supports emerging clean energy businesses in the Southern Tier

RGGI funds are supporting the 76West Clean Energy Competition, one of the largest competitions in the country that focuses on supporting and growing clean energy businesses and economic development. In 2017, a total of \$2.5 million will be awarded to six innovative companies from New York and across the United States. As a condition of the award, companies must either move to the Southern Tier or establish a direct connection with the Southern Tier, such as a supply chain, job development with Southern Tier companies, or other strategic relationships with Southern Tier entities that increases wealth creation and creates jobs. If the companies are already in the Southern Tier, they must commit to substantially growing their business and employment in the region.

4.3.4 Charge NY

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

Key accomplishments as of this quarter:

- Through September 2017, NYSERDA issued nearly 3,000 rebates.
- NYSERDA is preparing to launch a brand-neutral PEV consumer awareness campaign in collaboration with other Northeast states and 17 automakers. The campaign is expected to launch in 2018.
- NYSERDA's charging station deployment program is under development, with an Request for Proposals (RFP) expected to be released in 2018.

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 as of this quarter:

- HEVO has completed its project and has submitted its final report. The designs for the 3.3-7.7 kW wireless electric vehicle charging unit have been completed and reviewed by contract manufacturers. They have submitted for UL approval and expect to have completed the review process in early 2018.
- Unique Energy Solutions has completed the design and upfitting of a UPS delivery truck to be an all-electric truck. The truck is now undergoing testing prior to being used in actual operation in UPS's fleet in New York City. Plans are being developed for the manufacture of the vehicle in New York.
- Mobile Fleet, Inc. continues to work on the design of its anti-idling product and is making steady progress.
- EV-Box has completed work on its technical and commercial feasibility study for an AC and DC EV charger with integrated battery storage. This included the schematics and functional design of the system and the business case development for different markets and customers (residential and commercial). They are continuing their product commercialization efforts and seeking further funding and partnerships.
- Volpe, the National Transportation Systems Center, U.S. Department of Transportation delivered a synthesis of the state-of-the practice in the area of Smart Mobility to NYSERDA in September. They are currently developing recommendations for future NYSERDA Smart Mobility activities. The project is expected to be completed in early 2018.

Projects that were part of the Locomotive Idle Reduction Program (partially RGGI funded), which installed U.S. Environmental Protection Agency (EPA) SmartWay-verified idle reduction equipment on locomotives, remain in use and are reducing fuel use and emissions from these locomotives while saving the short line railroads money.

4.3.6 Carbon Capture, Recycling, and Sequestration

This program area aims to build the State's capacity for long-term GHG emissions reduction by researching strategies to prevent emissions from releasing 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.
- Supporting the development of carbon capture and sequestration demonstration projects in NYS.

Currently, the program's largest supported project is TriCarb, located in Rockland County. TriCarb is leveraging NYSERDA funding with more than \$8 million of DOE funds to investigate the potential for geological sequestration in the Newark Basin.

Key accomplishments as of this quarter:

- The final report has been completed and reviewed. The project is complete and is in the process of being closed.

4.3.7 Advanced Buildings

GHG emissions associated with the building electric and fossil fuel use are a major contributor of GHG emissions. The goal of the Advanced Buildings Program is to drive technology development and commercialization of innovative building technologies for existing buildings and new construction that offer greater energy efficiency, accelerate the integration of renewables into buildings, offer resiliency, and enable net zero energy building.

Key accomplishments as of this quarter:

- No key accomplishments for this quarter.

4.3.8 Competitive Greenhouse Gas Reduction Pilot

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

Key accomplishments as of this quarter:

- Both projects awarded under this program continue operating with improved performance. The Caithness Long Island Energy Center CGGR project completed its first full year of operation this year and resulted in an 143% improvement in emissions rate reduction post modification. The Con Ed East River Generating Station CGGR project continued to deliver emissions benefits in its second year of operation and realized a 393% improvement. In its first year of operation their project resulted in an 83% improvement in emissions rate reduction post modification.
- Due to persistent poor participation in this pilot program, the program was terminated and no further requests for proposal will be sought. The two projects awarded under the first program RFP will continue to be managed to verify performance.

4.3.9 Brookhaven National Laboratory Ion Collider

Cornell University (CU) and the Brookhaven National Laboratory (BNL) are designing, building and commissioning the Cornell-BNL ERL Test Accelerator (CBETA), a four-pass, 150 MeV electron Energy Recovery Linac that is a prototype for advanced technology to be used in the future BNL eRHIC accelerator.

This pilot-scale facility is located at Cornell University where all field testing/validation will occur. The work is being conducted at Cornell to fully leverage an existing \$32 million facility located on campus. This results in significant overall cost savings for the ERL project.

BNL will manage all aspects of the initiative and serve as the project contractor. The contract cost to NYSERDA is \$25 million and the project is expected to complete by April 2020.

Timely and successful testing/validation of the pilot-scale ERL will allow BNL to submit a competitive proposal to the Department of Energy (DOE) to secure an award to build and operate an electron-ion collider (EIC) on BNL's campus that includes a full-scale ERL as a major sub-system component of the eRHIC accelerator.

Key accomplishments as of this quarter:

- The project continues to move forward quickly, in production mode and in preparation for both the Fractional Arc Test and for construction of the full machine. While engineering work remains, and will extend through the next quarter, many procurements are arriving and are being prepared for installation. Major procurements in the next quarter include the FFAG production magnets and power supplies for the splitter magnets and the FFAG corrector magnets. The focus in the next quarter is readiness for the Fractional Arc Test which will occur in the first third of 2018, with an associated technical milestone on April 30, 2018.

4.4 Community Clean Energy

4.4.1 Climate Smart Communities

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

4.4.2 Economic Development Growth Extension Program (EDGE)

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

4.4.3 Cleaner, Greener Communities

A process evaluation of NYSERDA's Cleaner Greener Communities (CGC) program was completed in two waves and finalized in the second quarter of 2016. Wave One of this evaluation research was completed revealing a number of opportunities for NYSERDA to help regions implement their Phase I plans and achieve their sustainability goals. Wave Two revealed opportunities for communities to overcome common barriers to engaging in efficiency and sustainability activity and to encourage further investment in sustainability across the State's diverse regions. The process evaluation encompassing the two research waves was posted to NYSERDA's website in the fourth quarter of 2016.

Governor Cuomo announced the CGC program 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 ongoing investments in infrastructure aid in moving communities and the 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 as of this quarter:

- Executed one contract for CGC Round 2. One contract is still under negotiation.
- Received 67 new applications for incentives to 67 municipalities for adoption of streamlined permitting processes for solar electric systems or electric vehicle supply equipment (EVSE).
- Negotiating contracts for the third round of funding (\$25 million) for Phase II of the CGC program, which includes 17 projects. Eleven contracts have been executed. Six are still under negotiation.

4.4.4 Regional Economic Development and Greenhouse Gas Reduction Program

The Regional Economic Development and Greenhouse Gas Reduction (REDGHG) Program supports projects identified as priority initiatives consistent with Governor Cuomo's REDC initiative and 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.

4.4.5 Reforming the Energy Vision Campus Competition Program

Governor Cuomo’s Energy to Lead Competition is a competitive solicitation issued by NYSERDA that challenges colleges and student-led coalitions across the State to develop and implement plans to advance clean energy on their campuses or in their local communities in new ways. The three groups that propose the best solutions for an innovative clean energy project in energy efficiency, renewables or GHG emission reduction will win \$1 million each to help implement their plans. The Request for Proposals for the Energy to Lead Competition was released January 22, 2016. Three informational webinars were held and NYSERDA posted answers to frequently asked questions on their website.

Teams are to submit plans for projects demonstrating innovations in one or more of the following:

- Business model: a new way of paying for a project, lowering costs, or creating new revenue streams.
- Community engagement: an approach to build on an on-campus project to advance clean energy in the surrounding community.
- Curriculum integration: a model for integrating project construction, implementation, or operations into student coursework, workforce training, or internships.

Proposals for the Energy to Lead Competition were due April 4, 2016. NYSERDA received 40 proposals from 33 institutions. The three winning institutions and their proposed projects were announced on May 16, 2016, and are as follows:

- Bard College’s “Micro Hydro for Macro Impact” project will use local dams to develop micro hydropower. The project is expected to avoid 335 metric tons of GHG emissions annually, equivalent to taking 70 cars off the road.
- The University at Buffalo will implement the “Localizing Buffalo’s Renewable Energy Future” project, which will install 100 MW of clean solar power throughout the city. The implementation involves partnership with the City of Buffalo and several not-for-profit and educational partners.
- Broome Community College’s “Geothermal Learning Laboratory” project includes installing a closed loop geothermal system that uses the heat energy stored in the earth; real-time, public data-sharing about the system’s operations; and development of hands-on, geothermal material for secondary schools.

Key accomplishments as of this quarter:

- Work has begun assembling the University at Buffalo's Garden, Relax or Work (GRoW) Home, the institution's sustainable living project which took second-place at the U.S. Department of Energy's 2015 Solar Decathlon. The GRoW Home is being temporarily sited on the South Campus; permanent installation is anticipated to begin in 2018, with the GRoW Home situated adjacent to an existing solar PV array. Once permanently installed, the GRoW Home will act as a center clean energy exhibition and discussion for the on- and off-campus community.
- Broome Community College held a groundbreaking ceremony on September 21, 2017 to mark the start of construction on the Paul and Mary Calice and Mildred Barton Advanced Manufacturing Center, which will house the Energy to Lead-funded geothermal heating and cooling system and Geothermal Learning Laboratory.

4.4.6 Clean Energy Communities

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

The statewide Clean Energy Communities program, which is co-funded through the Clean Energy Fund (CEF), supports local governments with a common platform and the coaching, facilitation, technical assistance, and expertise for implementing the local-level policies and planning needed to drive future clean energy market activities. These local-level actions roll-up and help to deliver the regional sustainable growth strategies encouraged by the CGC program, consistent with the regional sustainability and economic development plans. The Clean Energy Communities program also complements the DEC's Climate Smart Communities (CSC) Certification Program by assisting communities working toward certification.

Key accomplishments as of this quarter:

- Clean Energy Communities Coordinators have helped 241 communities complete and submit 647 High Impact Actions, 503 of which were completed after program launch, through the Clean Energy Communities program.
- One hundred communities completed at least four High Impact Actions and became designated Clean Energy Communities.

Success Story 2: New York supports more than 100 communities using clean energy

RGGI funds are now supporting more than 100 local municipalities and communities throughout New York that have taken significant actions to be cleaner and greener through the State's Clean Energy Communities initiative. Local governments use the program to implement clean energy actions, save energy costs, create jobs, and improve the environment. In total, more than 270 communities are participating, and 730 actions have been completed.

4.4.7 Community Energy Engagement

This year NYSERDA plans to launch its Community Energy Engagement program, which is cofounded through the Clean Energy Fund (CEF), to build awareness and increase uptake of local renewable and energy efficiency solutions. The program will deploy trusted, local organizations to conduct energy awareness and education with residential, multifamily, and small business customers, with an emphasis on increasing the amount of funding and financing leveraged for the completion of clean energy projects. Additionally, the initiative will focus on improving energy affordability and increasing deployment of distributed energy resources for community members of all income levels, with a focus on low- to moderate-income (LMI) households and communities.

NYSERDA anticipates launching this initiative in 2017 with competitively selected organizations providing services in each of the 10 Economic Development Regions, as defined by Empire State Development. These organizations will deploy trusted, local Community Energy Advisers who engage with residents, small businesses, and multifamily building owners on how to reduce energy use and greenhouse gas emissions. By engaging directly with residents, small business, and multifamily building owners, Community Energy Advisers will help increase energy literacy and local understanding of the value of clean energy and reduced energy use. The face-to-face approach and focus on LMI residents and communities will ensure the Community Energy Engagement program makes the greatest impact.

Key accomplishments as of this quarter:

- NYSERDA awarded contracts eight of the 10 Economic Development Regions and issued a second RFP to solicit the remaining two organizations that will provide services in support of the Community Energy Engagement Program for the Mid-Hudson and North Country Regions. NYSERDA anticipates completion of the selection process and launching the program in Q4 2017.

4.5 Green Jobs - Green New York

Green Jobs - Green New York (GJGNY) provides funding for energy assessments, low-cost financing for energy upgrades, and technical and financial support to develop a clean energy workforce. GJGNY is a statewide effort to strengthen communities through energy efficiency and uses constituency-based organizations (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 2016 Annual Report, issued in September 2016, presents financial data for the approved GJGNY programs through June 30, 2016.

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

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

Funding allocated to individual components of GJGNY is nearly fully committed or expended. In order to maintain required elements of the Act, NYSERDA included GJGNY initiatives in the planning of the CEF.⁷ NYSERDA is working with stakeholders to incorporate lessons learned from GJGNY into CEF planning to ensure benefits from the GJGNY initiatives, particularly those benefitting the LMI sector, continue.

⁷ The Clean Energy Fund (CEF), one of Reforming the Energy Vision's (REV) three strategic pillars, is designed to deliver on the State's commitment to reduce ratepayer collections, drive economic development, and accelerate the use of clean energy and energy innovation. It will reshape the State's energy efficiency, clean energy, and energy innovation programs. Visit nyserda.ny.gov/About/Clean-Energy-Fund for more details regarding CEF planning.

4.5.1 Assessments

One- to Four-Family Residential Buildings Program Assessments

HPwES is a comprehensive energy efficiency services program for existing one- to four-family homes. Participating BPI GoldStar contractors conduct comprehensive home energy assessments and upgrades. Free and reduced-cost home energy assessments are available to homeowners through GJGNY funding, which drives increased participation in this program and cuts additional GHG emissions.

Effective for new applications submitted as of January 1, 2017, GJGNY funded audits in territories not covered by the Clean Energy Fund or PSEG Long Island's HPwES Program, specifically municipal electric territories. NYSERDA's HPwES Program is using Clean Energy Funds for home energy assessments in participating electric utility territories and are reported separately.

Key accomplishments as of this quarter:

- A total of 79 GJGNY funded assessments were completed this quarter, bringing the total to 99,249 residential GJGNY assessments completed with RGGI funds; 92,202 (93%) were provided at no cost to the customer.
- Of the program cumulative 32,965 completed residential units served through HPwES resulting from a GJGNY assessment and/or GJGNY financing, 11,525 (35%) units are associated with income-qualified Assisted HPwES customers.
- Constituency-based organizations assisted with the completion of 2,774 units, or 6% 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 LMI residential buildings with five or more units to increase adoption of clean energy in NYS. 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 EEPS or RGGI. Per-unit incentives are available for projects predicted to achieve the 15% energy reduction threshold. Additional performance payments apply to eligible projects that predict and achieve savings of more than 20%.

Key accomplishments as of this quarter:

- A total of 324 assessments were completed through September 30, 2017; of these, 56% are associated with affordable housing.
- Of the program cumulative 37,587 residential units served with installed measures, 20,933 (56%) units are associated with affordable housing.

Small Commercial Energy Efficiency Program Assessments

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

Key accomplishments as of this quarter:

- Through program end February 2017, a total of 3,367 GJGNY-funded assessments had been completed.
- The 2015 Small Commercial Energy Efficiency Program Impact Evaluation reported percentage% of the energy savings recommended through program audits were implemented, resulting in an estimated total of 1,481 GJGNY-funded completed projects through February 28, 2017.

4.5.2 Financing

One- to Four-Family Residential Financing

GJGNY financing is available to participants in HPwES, NY-Sun and Renewable Heat NY Program to finance the installation of eligible energy efficiency and renewable energy improvements with energy savings helping to pay for the cost of the work. The Smart Energy Loan and the innovative On-Bill Recovery (OBR) Loan are the two financing options available through GJGNY, which enable more projects resulting in greater reductions of GHG emissions. Lower interest rates are available for qualifying LMI households.

Key accomplishments as of this quarter:

- A total of 21,128 loans have been issued totaling \$252.2 million.
- Assisted HPwES customers make up 34.4% of the Home Performance loans issued, representing 25.7% of the total loan funds.
- Through September 30, 2017, a total of 7,306 OBR Loans have closed, valued at approximately \$101.7 million.
- Through September 30, 2017, of the total 21,128 loans closed, 6,770 are solar electric loans valued at approximately \$114 million. Since September 2016, approximately 6% of solar electric loans are for Affordable Solar customers.

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 to support the goal of increased clean energy adoption statewide. These programs make it easier to assess, fund, implement, and measure energy efficiency upgrades that improve building performance and reduce costs. Participation loans are available through

the program 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% of the loan (up to a maximum of \$5,000 per unit or \$500,000 per building) at 2% interest, and the lender setting the interest rate on its share of the loan.

Key accomplishments as of this quarter:

- Through September 30, 2017, 23 loans closed totaling \$12.1 million. NYSERDA's share of the total loan value is \$3.9 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 to support the goal of increased clean energy adoption statewide. In June 2011, NYSERDA launched the Participation Loan product to small business and not-for-profit customers. NYSERDA provides 50% of the loan principal, up to \$50,000, at 2% interest and the participating lender provides the remaining loan principal at its market interest rate. In June 2012, NYSERDA launched the OBR Loan for small business and not-for-profit customers, making a NYSERDA loan available for up to \$50,000 at 2.5% interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill. Fourteen lenders have agreed to offer either Participation Loans or OBR loans.

Key accomplishments as of this quarter:

- A total of 38 OBR Loans have been closed with a total value of \$1,194,760, which represents 93% of the total financing value of \$1,273,888.
- A total of 28 Participation Loans have closed with a value of \$1,877,489. NYSERDA's share of the total value is \$885,535.

4.5.3 Workforce Development, Outreach, and Marketing

Workforce Development

The GJGNY Workforce Training and Development (WFD) initiative complements other NYSERDA and NYS Department of Labor programs targeted at preparing individuals for energy efficiency, solar thermal, and solar electric careers in NYS. WFD programs also help to build the State's capacity for long-term carbon reduction and facilitate energy education programs that will help build a clean energy future. Specifically, WFD efforts under GJGNY seek to expand energy-specific content in NYS Registered Apprenticeship and third-party accredited building trades programs. Expectations are

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 communities to expand training opportunities.

From the program's inception through September 2017, 3,919 New Yorkers were trained in a range of energy efficiency and renewable energy courses.

While most GJGNY-funded training partnership agreements ended by December 2016, NYSERDA entered into a new agreement with Green City Force (GCF), a Brooklyn-based provider of training and job placement support to disadvantaged young adults, in April 2017. Prior to the latest investment GJGNY funding, GCF was under contract to offer clean energy training and internships to 75 program participants through a contract funded under the System Benefits Charge (SBC). The addition of \$60,000 in GJGNY funding has allowed GCF to expand its network of employer partners resulting in additional opportunities for internships, apprenticeships, and job placement for program participants and alumni. Additionally, participants and alumni now receive assistance with resume development, job readiness coaching, and job search assistance as well as support services including referrals to subsidized child care services and transportation assistance.

- GJGNY funding is being used to support resume development, job readiness, and job searching and two full time Career and Alumni Managers have been hired to support program participants and graduates.
- The first cohort of 35 students under this agreement was graduated on June 1, 2017. Through September, 32 graduates have been placed in clean energy sector jobs, two have been placed in jobs outside the clean energy sector, and one is still searching for work.
 - One of those job placements is a young man from Seth Low Houses in Brownsville, Brooklyn. He was originally placed in a paid internship with Ameresco working on the HUD-funded Energy Performance Contracting (EPC) program. Ameresco was so impressed with his work that they've since hired him as a full time, permanent employee.
 - Seven program graduates have been hired by Franklin Energy to do work under the Brooklyn Queens Demand Management project in coordination with Con Edison.

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. The expectation for this community-based approach, combined with statewide marketing, is an increase the reach of the program, particularly among disadvantaged populations and those not traditionally participating in energy efficiency programs. Participating in the programs empowers communities in their transition toward sustainability while producing lower carbon emissions.

As of June 30, 2017, the GJGNY CBO contracts, which were to have expired, were extended another month to provide coverage for the State while a new outreach program, Community Energy Engagement Program (RFP 3588), was solicited for and selected new awardees. Of the 10 regions in New York State, eight proposals were selected for awards. As a result, ANCA and RUPCO contracts were extended for three months while a second solicitation was issued to seek coverage in the North Country and Mid-Hudson regions. The balance of the CBOs spent most of this time following up with past leads to boost their completion rates before July 31. In the course of closing out those contracts, CBOs provided reports to create a synopsis and analysis of the efforts on behalf of the GJGNY CBO program. The following is a snapshot of their most successful outreach efforts during their time in the program. (The details for RUPCO also include outreach activities post July.)

According to the CBOs, successful strategies for outreach included:

- PathStone held monthly workshops at their headquarters in Rochester, as well as in the surrounding counties usually during the fall and winter. In addition to attending local health and wellness fairs, agency meetings, holding In-service presentations, and maintaining a presence on social media, they also helped clients complete AHP and EmPower paperwork. They also held several lunch-and-learns and in-services at local businesses and organizations to create strong referral systems and met with customers at a convenient time for them. Their outreach to local organizations and community groups has helped promote and advertise events and program availability. Joining local community organizations in rural areas (i.e., Genesee County Interagency Network, Wayne County Rural Network, Rochester People's Climate Coalition, etc.) also contributed to an ongoing awareness of services available to the local housing community.

- El Puente made presentations at different institutions of worship and community boards, as well as non-profit organizations that provide homeownership services. Working constantly with other CBOs, especially the ones that provide housing services in different neighborhoods was a great opportunity to generate quality leads. El Puente reached out to organizations such as the Urban Homesteading Assistance Board (UHAB) that offers housing assistance services, for the opportunity to make presentations for their members, about the Multifamily Performance program. El Puente was able to promote NYSERDA's Multifamily programs through UHAB's monthly newsletter with mailings to its database of mostly low-income COOPs that are Housing Development Fund Corporation (HDFC).
- NHSJ and their subcontractor Chhaya CDC as CBOs offered a variety of programs in the areas of economic development, housing preservation, asset building, construction management, financial literacy, first time home buyers and post purchase housing counseling etc. NHSJ found that being a loan originator for the Affordable Housing Corp. homeowner loan program was a major factor in completing retrofits on homes that had so many other issues. The AHC loan is a forgivable product that is based on several qualifying guidelines of income, assets, need and the ability to maintain home within the community. It is a system that assists with aging in place and maintains property values, while preserving low to moderate income households. Households can qualify for 100% of repair cost up to \$40,000.00 towards repair cost from a licensed contractor. NHSJ was able to generate additional leads by integrating the GJGNY info. sessions within the AHC funding counseling sessions to educate homeowners on energy efficiency both before and after home ownership became a reality. Clients who would otherwise be unable to complete retrofits was able to secure additional funding to AHC funds to complete upgrades and repairs. Other clients through OBR Loan had the ability to secure funds at a very low interest rate and repayment plan that tied into energy savings.
- Staff researched and attended local community events and did presentations in front of local civic associations. SSBx had more success in generating leads when they would table at events because people who were going to that event most of the time were interested in a particular topic. When tabling at events held by a government agency, the CBO had a lot of success generating good leads and met people who were interested in getting some type of work done to their home or properties. They established a relationship with NYC's Housing Preservation and Development and regularly attended their events targeted at homeowners, tenants, landlords and building owners. SSBx was able to obtain about 20-30 leads at each HPD event, of those about a third to a half were multifamily leads.

- PUSH Buffalo's Aggregation Program included targeted outreach to 27 zip codes in Erie County that had been identified as having the most potential for needing home performance related improvements. Over the phone pre-screening of homes was the approach to identify eligibility for various NYSERDA programs such as EmPower New York, Assisted Home Performance with ENERGY STAR, PUSH Green's Staying Warm and Dry on the West Side (WDWS) comprehensive home repair program, as well as discussing the benefits of participating in the Friends and Neighbors (F&N) residential aggregation program. In order to recruit eligible home owners, PUSH Green participates in a myriad of outreach events that include PUSH organizing events, tabling, presentations, mailings, paid advertisements, networking events, television, social media, and house meetings. This outreach may also happen in coordination with elected officials or trusted community leaders that can help give PUSH, a West Side of Buffalo Community Based Organization, more credibility in communities that may have never heard of PUSH Buffalo. The success of the ambassador program showed how the trusted messenger in a community helps boost participation in the programs. In addition, the ability to work with homeowners one on one throughout the entire process helped mitigate issues that came up and facilitated more project completions than those projects that did not receive the same level of engagement.
- For NHS Staten Island, being a recipient of the NYS Affordable Housing Corp. residential loans for housing repair was instrumental in helping them serve customers that needed work beyond the scope of an energy audit. It was a primary reason that brought potential customers to their door and allowed them to provide services that the customer otherwise could not afford. NHS also held training sessions in their offices that included home maintenance. They found that the visual and experiential experiences on the benefits of the program proved most successful in their outreach efforts. Their Sustainable Development Month with the EcoHouse (from Weatherization agency CEC) was one of their most successful outreach events held at their offices. National Grid was also an important ally with their expo's that brought multiple service providers in one space and brought in many customers seeking services.
- AHP established formal and informal alliances with 84 organizations to extend the reach of GJGNY outreach and marketing which facilitated awareness of NYSERDA programs through AHP's Homeownership Center, especially through contacting past program participants and 607 successful low-income home buyers. Disseminated energy efficiency information through email and AHP's social media and through community allies and networks reaching 36,232 recipients.

- In the Southern Tier region, PPEF set-up Green Team Consortiums (GTC) in all eight counties. These GTC groups acted as liaisons between PPEF and the larger Southern Tier community. PPEF trained GTC members to conduct the three components of PPEF's successful strategy: (a) Research (b) Outreach (c) Case-Management. I.e. Otsego/Chenango County consortiums distributed flyers community-wide, placed articles in the Chamber of Commerce Newsletter and sent information to radio talk shows. GTC provided the opportunity to connect with rural homeowners that are traditionally spread thinly throughout the Southern Tier region and are difficult to access. GTCs promoted additional community engagement by utilizing organizations best situated to speak with rural homeowners due to their regional specific knowledge. PPEF generated leads through the use of earned media news press conferences every six months that involved individual testimonials, BPI Contractors, and known community leaders and public officials generating significant program interest. PPEF placed articles regarding the HPwES program in all eight county newspapers of the Southern Tier every six months staggered at three months from testimonial press conferences.
- ANCA conducted community outreach to local NFP organizations, civic organizations, county LMI programs, senior groups, local governments, local fire departments and churches. The method that was the most successful over time was direct face-to-face contact, application in hand. Success was also common when, instead of randomly scheduled events that were blanket-marketed, ANCA would build sidewalks where the paths were, meaning that they would use various gatherings to address peer-groups who already formed through other common interests. In addition to the standard written materials, personal reflections/ testimonials of success stories were also provided to individuals and groups.
- RUPCO relies on key referral sources to recruit and enroll customers on a daily basis. Key partners include Central Hudson Gas & Electric, Energize NY, Courtney Strong Inc., and their municipal partners. In addition, RUPCO generates a majority of their referrals from Home Performance Contractors and events.
- LIPC used many different tactics to get leads including door to door, tabling at community events, phone banking, presentations, walking up to people on the street. Of the homeowners who received an audit, 68% went through with the retrofit. LIPC felt their high conversion rate was due to the high-level education provided before the audit is done and because they pre-qualified the homeowner. Using early adopters as spokespeople to build trust and share personal experiences for the program and giving testimonials was also a great way to gather stronger leads.

4.6 Green Bank

NY Green Bank, a division of NYSERDA, is a \$1 billion investment vehicle established to attract private sector capital to accelerate clean energy deployment in NYS. NY Green Bank works to increase the size, volume, and breadth of clean energy investment activity throughout the State, expand the base of investors focused on clean energy, and increase clean energy participants' access to capital. To do so, NY Green Bank collaborates with the private sector to develop transaction structures and methodologies that overcome typical clean energy investment barriers. NY Green Bank focuses on opportunities that create attractive precedents, standardized practices, and roadmaps that capital providers can willingly replicate and scale. As funders "crowd in" to a particular area within the clean energy landscape, NY Green Bank moves on to other areas that have attracted less investor interest.

To solve client problems in real-time and address capital provider needs, NY Green Bank operates comfortably within private sector time horizons and commercial norms. Visit www.greenbank.ny.gov for more information on NY Green Bank's growing portfolio and how industry participants and capital providers can do business with NY Green Bank.

Key accomplishments and developments as of this quarter:

- Executed and closed two transactions totaling \$31.5 million contributing to NY Green Bank's overall investments to date of \$440.9 million across various technologies and financing arrangements.
- Continued to grow NY Green Bank revenues, including achieving cumulative breakeven (where revenues since inception exceed expenses since inception).
- Through ongoing business development activities, achieved an active pipeline of potential investments progressing towards close at the end of the quarter of \$519.0 million.
- Filed quarterly Metrics Report with the PSC on August 14, 2017.
- On September 20, 2017, Governor Andrew M. Cuomo announced ambitious expansion of NY Green Bank to grow sustainable infrastructure financing and combat climate change (see www.greenbank.ny.gov/News-and-Media/In-The-News/2017-09-20-Governor-Cuomo-and-US-Climate-Alliance-Announce-States-are-on-Track).

4.7 Program Evaluation

Several RGGI evaluation studies are underway or in the planning stages as of the second quarter of 2017. 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**⁸ help identify whether a program has various factors in place that will ensure an evaluation is justified, feasible, and likely to provide useful information.

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

4.7.1 Evaluation of Energy Efficiency and Other Deployment Programs

HPwES: The Green Jobs - Green New York (GJGNY) audit program was started in 2010 to provide homeowners in New York free or reduced cost energy audits and encourage installation of energy efficiency measures through the HPwES Program. Customers who choose to install measures suggested in the audit can elect to either use a NYSERDA Home Performance contractor through HPwES or install measures on their own. This second type of customers, a GJGNY audit-only recipient who installs measures outside of the HPwES Program, generates savings, however these savings are not captured or recorded as contributing toward the state's energy goals. NYSERDA is reviewing the cost effectiveness and overall added value of conducting a second evaluation of GJGNY-funded audit-only projects for studies completed between 2014 and 2016 to estimate these savings.

A billing analysis of Home Performance GJGNY OBR projects is in the planning phase. As appropriate, future results will be summarized in this report.

Industrial Innovations: Evaluation plans for this program may be considered in the future.

⁸ Formerly known as Evaluability Assessment.

4.7.2 Baseline Studies

NYSERDA has undertaken 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 the next three and five years. Although these large studies are 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 is available on NYSERDA's website and the data set is available on Open NY.⁹ Scoping has begun on an update to this baseline study. The Commercial Baseline study is underway with an anticipated completion date of 2018.

⁹ Residential Statewide Baseline Study of New York State, nyserdera.ny.gov/Residential-Statewide-Baseline-Study-of-New-York-State.aspx and the associated data on Open NY (<https://data.ny.gov/en/browse?q=RSBS>)

Appendix A: Savings Calculations Methodology

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

A.1 Energy Savings

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

A.2 CO₂ Reductions

Emissions factors 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,¹⁰ 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,¹¹ 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 |

¹⁰ A global warming potential is a measure that estimates how much a given mass of a GHG contributes to global warming. Calculations span over a specific time interval, which is 100 years for the IPCC Second Assessment Report values.

¹¹ 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. The 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 derived from the 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 Sector¹²

| | Transport (lb CO ₂ e/MMBtu) | Residential (lb CO ₂ e/MMBtu) | Commercial (lb CO ₂ e/MMBtu) | Industrial (lb CO ₂ e/MMBtu) |
|--------------------------|--|--|---|---|
| Coal | N/A | 224.8 | 211.4 | 203.7 |
| Natural Gas | 117.2 | 117.2 | 117.2 | 114.5 |
| #2 Oil/Distillate/Diesel | 163.0 | 162.9 | 162.9 | 162.9 |
| #6 Oil/Residual | N/A | N/A | 166.0 | 166.0 |
| Kerosene | N/A | 161.2 | 161.2 | 161.2 |
| Propane | 136.1 | 136.1 | 136.1 | 136.1 |
| Gasoline | 158.0 | N/A | N/A | N/A |
| Aviation Fuel | 159.2 | N/A | N/A | N/A |
| Wood | N/A | 18.2 | 18.2 | 4.1 |
| Steam | N/A | 106.1 | 106.1 | N/A |

A marginal emission factor of 1,160 pounds of CO₂e/MWh estimates emission reductions associated with electricity use reductions for all sectors.¹³ Although electricity savings may not lead to near-term emission reductions under the RGGI CO₂ cap, savings will potentially reduce imports of electricity to NYS; 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.

¹² Beginning with Q4 2016, NYSERDA updated emission factors for natural gas, #2 oil, #6 oil, kerosene, propane, wood and steam to be consistent with emission factors used in the updated NYS Greenhouse Gas Inventory (<https://www.nyserdera.ny.gov/About/Publications/EA-Reports-and-Studies/Energy-Statistics>). These factors are derived from EPA’s February 2016 State Inventory Tool release (<https://www.epa.gov/statelocalclimate/state-inventory-and-projection-tool>). Steam emission factors have been updated to be consistent with New York City’s updated Greenhouse Gas Inventory (http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC_GHG_Inventory_2014.pdf).

¹³ With the submittal of its Clean Energy Fund Investment Plan Budget Accounting and Benefits Chapter on February 22, 2016, NYSERDA adopted the NYS Public Service Commission’s recommendation in its January 21, 2016 Order Establishing the Benefit Cost Analysis Framework that New York’s GHG emissions factor methodology shift from an average grid emission profile to a marginal grid emission profile. Due to this shift, beginning in 2016, New York’s factor to calculate GHG emissions reductions has changed from 625 pounds CO₂e/MWh to 1,160 pounds CO₂e/MWh. The emissions reductions calculated for this report reflect the new factor of 1,160 pounds CO₂e/MWh.

A.3 Bill Savings

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

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

Table A-3. Fuel Prices by Sector^a

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

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

^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 2014 retail prices as reported in NYSERDA's *Patterns and Trends-NYS Energy Profiles: 1997-2014* (NYSERDA 2016).

Table A-4. Program Measure Life Assumptions

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

| 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 |
| RGGI – Cleaner, Greener Communities | 15 | 15 |
| RHNY - Boilers | 20 | 20 |
| RHNY - Pellet Stoves | 20 | 20 |
| LIPA Efficiency | 18 | NA |
| LIPA Photovoltaic and Efficiency Initiative | 25 | N/A |
| Regional Economic Development and GHG Reduction | 18 | 18 |
| Charge NY | 10 | 10 |

Appendix B: Former Program Names

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 Installed MMBtu | Cumulative Annual Installed MWh Saved | Cumulative Annual Installed 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 | 115,024 | 44,470 | 178,048 | 53,400,000 |
| 3/31/2015 | Qrt 1 | 1,614,354 | 120,453 | 54,642 | 191,322 | 58,500,000 |
| 6/30/2015 | Qrt 2 | 1,726,165 | 165,092 | 78,093 | 216,657 | 75,105,825 |
| 9/30/2015 | Qrt 3 | 1,894,278 | 207,154 | 97,314 | 245,176 | 89,706,416 |
| 12/31/2015 | Qrt 4 | 2,025,159 | 236,298 | 120,506 | 277,276 | 102,222,096 |
| 3/31/2016 | Qrt 1 | 2,079,825 | 237,147 | 178,908 | 488,278 | 117,000,474 |
| 6/30/2016 | Qrt 2 | 2,131,898 | 252,067 | 183,534 | 490,159 | 140,543,911 |
| 9/30/2016 | Qrt 3 | 2,197,233 | 251,124 ¹⁴ | 198,807 | 502,987 | 144,247,847 |
| 12/31/2016 | Qrt 4 | 2,378,290 | 383,344 | 234,123 | 617,467 | 170,237,928 |
| 3/31/2017 | Qrt 1 | 2,841,408 | 537,096 | 323,360 | 782,374 | 215,524,461 |
| 6/30/2017 | Qrt 2 | 3,001,469 | 603,222 | 290,788 | 812,802 | 221,504,805 |

¹⁴ The decrease in Cumulative Annual Installed MWh Saved is due to a change in methodology for the GJGNY Multifamily Performance Program, from reporting the savings from measures as a result of an energy audit to only reporting the measures actually installed.

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 | |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 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 | - | |
| 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 | |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 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 | |
| 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 | - | - |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 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 | - |
| 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 |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 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 | - | - |
| 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 |
| 3/31/2015 | Qrt 1 | Diesel | - | - |
| 3/31/2015 | Qrt 1 | Gasoline | - | - |
| 3/31/2015 | Qrt 1 | Kerosene | 3,104 | 792 |
| 3/31/2015 | Qrt 1 | Natural Gas | 671,315 | 301,729 |
| 3/31/2015 | Qrt 1 | Oil | 885,524 | 498,536 |
| 3/31/2015 | Qrt 1 | Propane | 19,357 | 17,177 |
| 3/31/2015 | Qrt 1 | Steam | 15,969 | 19,056 |
| 3/31/2015 | Qrt 1 | Wood | 17,781 | 4,380 |
| 3/31/2015 | Qrt 1 | Residual Oil | - | - |
| 3/31/2015 | Qrt 1 | Coal | 1,305 | 315 |
| 6/30/2015 | Qrt 2 | Diesel | - | - |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 6/30/2015 | Qrt 2 | Gasoline | - | - |
| 6/30/2015 | Qrt 2 | Kerosene | 3,763 | 770 |
| 6/30/2015 | Qrt 2 | Natural Gas | 694,322 | 220,988 |
| 6/30/2015 | Qrt 2 | Oil | 955,804 | 501,564 |
| 6/30/2015 | Qrt 2 | Propane | 22,091 | 67,535 |
| 6/30/2015 | Qrt 2 | Steam | 15,969 | 16,372 |
| 6/30/2015 | Qrt 2 | Wood | 20,558 | 20,411 |
| 6/30/2015 | Qrt 2 | Residual Oil | - | - |
| 6/30/2015 | Qrt 2 | Coal | 1,442 | 285 |
| 9/30/2015 | Qrt 3 | Diesel | - | - |
| 9/30/2015 | Qrt 3 | Gasoline | - | - |
| 9/30/2015 | Qrt 3 | Kerosene | 4,063 | 875 |
| 9/30/2015 | Qrt 3 | Natural Gas | 786,147 | 224,883 |
| 9/30/2015 | Qrt 3 | Oil | 1,019,266 | 404,798 |
| 9/30/2015 | Qrt 3 | Propane | 24,464 | 51,936 |
| 9/30/2015 | Qrt 3 | Steam | 15,969 | 11,899 |
| 9/30/2015 | Qrt 3 | Residual Oil | - | - |
| 9/30/2015 | Qrt 3 | Coal | 1,627 | 326 |
| 12/31/2015 | Qrt 4 | Diesel | - | - |
| 12/31/2015 | Qrt 4 | Gasoline | - | - |
| 12/31/2015 | Qrt 4 | Kerosene | 4,581 | 783 |
| 12/31/2015 | Qrt 4 | Natural Gas | 829,928 | 202,156 |
| 12/31/2015 | Qrt 4 | Oil | 1,116,994 | 376,191 |
| 12/31/2015 | Qrt 4 | Propane | 28,612 | 10,054 |
| 12/31/2015 | Qrt 4 | Steam | 15,969 | 12,272 |
| 12/31/2015 | Qrt 4 | Wood | 26,889 | 4,736 |
| 12/31/2015 | Qrt 4 | Residual Oil | - | - |
| 12/31/2015 | Qrt 4 | Coal | 2,186 | 319 |
| 3/31/2016 | Qrt 1 | Diesel | - | - |
| 3/31/2016 | Qrt 1 | Gasoline | - | - |
| 3/31/2016 | Qrt 1 | Kerosene | 5,172 | 866 |
| 3/31/2016 | Qrt 1 | Natural Gas | 692,629 | 193,265 |
| 3/31/2016 | Qrt 1 | Oil | 1,297,717 | 291,552 |
| 3/31/2016 | Qrt 1 | Propane | 28,921 | 9,236 |
| 3/31/2016 | Qrt 1 | Steam | 23,849 | 12,023 |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 3/31/2016 | Qrt 1 | Wood | 29,115 | 4,429 |
| 3/31/2016 | Qrt 1 | Residual Oil | - | - |
| 3/31/2016 | Qrt 1 | Coal | 2,422 | 326 |
| 6/30/2016 | Qrt 2 | Diesel | - | - |
| 6/30/2016 | Qrt 2 | Gasoline | - | - |
| 6/30/2016 | Qrt 2 | Kerosene | 5,530 | 673 |
| 6/30/2016 | Qrt 2 | Natural Gas | (803,957) | 181,393 |
| 6/30/2016 | Qrt 2 | Oil | 1,343,608 | 265,944 |
| 6/30/2016 | Qrt 2 | Propane | 30,397 | 5,654 |
| 6/30/2016 | Qrt 2 | Steam | 23,849 | 13,273 |
| 6/30/2016 | Qrt 2 | Wood | 29,946 | 3,406 |
| 6/30/2016 | Qrt 2 | Residual Oil | 1,500,062 | - |
| 6/30/2016 | Qrt 2 | Coal | 2,462 | 250 |
| 9/30/2016 | Qrt 3 | Diesel | - | - |
| 9/30/2016 | Qrt 3 | Gasoline | - | - |
| 9/30/2016 | Qrt 3 | Kerosene | 5,863 | 302 |
| 9/30/2016 | Qrt 3 | Natural Gas | (767,716) | 199,946 |
| 9/30/2016 | Qrt 3 | Oil | 1,373,947 | 254,114 |
| 9/30/2016 | Qrt 3 | Propane | 30,903 | 10,000 |
| 9/30/2016 | Qrt 3 | Steam | 21,663 | 9,325 |
| 9/30/2016 | Qrt 3 | Wood | 30,049 | 3,377 |
| 9/30/2016 | Qrt 3 | Residual Oil | 1,500,062 | - |
| 9/30/2016 | Qrt 3 | Coal | 2,462 | 116 |
| 12/31/2016 | Qrt 4 | Diesel | - | - |
| 12/31/2016 | Qrt 4 | Gasoline | 1,190 | - |
| 12/31/2016 | Qrt 4 | Kerosene | 6,611 | 421 |
| 12/31/2016 | Qrt 4 | Natural Gas | (626,814) | 152,521 |
| 12/31/2016 | Qrt 4 | Oil | 1,415,357 | 184,861 |
| 12/31/2016 | Qrt 4 | Propane | 32,516 | 3,724 |
| 12/31/2016 | Qrt 4 | Steam | 21,663 | 7,978 |
| 12/31/2016 | Qrt 4 | Wood | 25,089 | 893 |
| 12/31/2016 | Qrt 4 | Residual Oil | 1,500,062 | - |
| 12/31/2016 | Qrt 4 | Coal | 2,616 | 127 |
| 3/31/2017 | Qrt 1 | Diesel | - | - |
| 3/31/2017 | Qrt 1 | Gasoline | 986 | - |

Table C-2 continued

| Quarter End Date | Quarter | Fuel Type | Cumulative Annual (MMBtu) | Cumulative Annualized Pipeline (MMBtu) ^a |
|------------------|---------|--------------|---------------------------|---|
| 3/31/2017 | Qrt 1 | Kerosene | 7,595 | 243 |
| 3/31/2017 | Qrt 1 | Natural Gas | (239,961) | 127,311 |
| 3/31/2017 | Qrt 1 | Oil | 1,486,761 | 116,157 |
| 3/31/2017 | Qrt 1 | Propane | 34,141 | 5,575 |
| 3/31/2017 | Qrt 1 | Steam | 21,663 | 6,255 |
| 3/31/2017 | Qrt 1 | Wood | 18,271 | (215) |
| 3/31/2017 | Qrt 1 | Residual Oil | 1,563,332 | - |
| 3/31/2017 | Qrt 1 | Coal | 2,619 | 47,323 |
| 6/30/2017 | Qrt 2 | Diesel | - | - |
| 6/30/2017 | Qrt 2 | Gasoline | 22,986 | - |
| 6/30/2017 | Qrt 2 | Kerosene | 8,160 | 228 |
| 6/30/2017 | Qrt 2 | Natural Gas | (204,725) | 190,835 |
| 6/30/2017 | Qrt 2 | Oil | 1,600,554 | 100,523 |
| 6/30/2017 | Qrt 2 | Propane | 35,401 | 10,609 |
| 6/30/2017 | Qrt 2 | Steam | 21,678 | 4,660 |
| 6/30/2017 | Qrt 2 | Wood | 14,722 | (6) |
| 6/30/2017 | Qrt 2 | Residual Oil | 1,500,062 | - |
| 6/30/2017 | Qrt 2 | Coal | 2,631 | 66,179 |
| 9/30/2017 | Qrt 3 | Diesel | - | - |
| 9/30/2017 | Qrt 3 | Gasoline | 47,973 | - |
| 9/30/2017 | Qrt 3 | Kerosene | 8,493 | 167 |
| 9/30/2017 | Qrt 3 | Natural Gas | (278,856) | 351,749 |
| 9/30/2017 | Qrt 3 | Oil | 1,557,812 | 209,256 |
| 9/30/2017 | Qrt 3 | Propane | 35,638 | 2,707 |
| 9/30/2017 | Qrt 3 | Steam | 21,678 | 17,094 |
| 9/30/2017 | Qrt 3 | Wood | 14,997 | (612) |
| 9/30/2017 | Qrt 3 | Residual Oil | 1,500,062 | 130 |
| 9/30/2017 | Qrt 3 | Coal | 2,663 | 73,810 |

^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 | 41,863 | \$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 |

Table D-1 continued

| Auction Date | Control Period | Clearing Price | New York State Allowances Sold | New York State Auction Proceeds |
|------------------------------------|----------------|----------------|--------------------------------|---------------------------------|
| 3/11/2015 | Third | \$5.41 | 5,906,447 | \$31,953,878 |
| 6/3/2015 | Third | \$5.50 | 5,906,446 | \$32,485,453 |
| 9/9/2015 | Third | \$6.02 | 9,799,723 | \$58,994,332 |
| 12/2/2015 | Third | \$7.50 | 5,906,446 | \$44,298,345 |
| 3/9/2016 | Third | \$5.25 | 5,691,771 | \$29,881,798 |
| 6/1/2016 | Third | \$4.53 | 5,691,771 | \$25,783,723 |
| 9/7/2016 | Third | \$4.54 | 5,691,771 | \$25,840,640 |
| 12/7/2016 | Third | \$3.55 | 5,691,770 | \$20,205,784 |
| 3/8/2017 | Third | \$3.00 | 5,528,805 | \$16,586,415 |
| 6/07/2017 | Third | \$2.53 | 5,528,805 | \$13,987,877 |
| 9/7/2017 | Third | \$4.35 | 5,528,805 | \$24,050,302 |
| First Control Period Total | | | 144,305,904 | \$336,282,535 |
| Second Control Period Total | | | 128,764,643 | \$391,950,232 |
| Third Control Period Total | | | 66,872,560 | \$324,068,546 |
| TOTAL | | | 339,943,107 | \$1,052,301,313 |

- a NYS 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 concluded on December 31, 2014. The third control period took effect on January 1, 2015 and extends through December 31, 2018.

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 |

Table E-1 continued

| Quarter End Date | Quarter | Fund Category | Cumulative Funds (\$) |
|-------------------------|----------------|--|------------------------------|
| 3/31/2014 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$4,400,174 |
| 3/31/2014 | 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 |
| 3/31/2015 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$5,900,174 |
| 3/31/2015 | Qrt 1 | Interest Allocated to the GJGNY Program | \$1,779,747 |
| 3/31/2015 | Qrt 1 | RGGI Auction Proceeds | \$760,186,645 |
| 6/30/2015 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$5,900,174 |
| 6/30/2015 | Qrt 2 | Interest Allocated to the GJGNY Program | \$1,779,747 |
| 6/30/2015 | Qrt 2 | RGGI Auction Proceeds | \$792,672,098 |
| 9/30/2015 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$5,900,174 |
| 9/30/2015 | Qrt 3 | Interest Allocated to the GJGNY Program | \$1,779,747 |
| 9/30/2015 | Qrt 3 | RGGI Auction Proceeds | \$851,666,430 |
| 12/31/2015 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$5,900,174 |
| 12/31/2015 | Qrt 4 | Interest Allocated to the GJGNY Program | \$1,779,747 |
| 12/31/2015 | Qrt 4 | RGGI Auction Proceeds | \$895,964,775 |
| 3/31/2016 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$9,067,174 |
| 3/31/2016 | Qrt 1 | Interest Allocated to the GJGNY Program | \$1,779,747 |
| 3/31/2016 | Qrt 1 | RGGI Auction Proceeds | \$925,846,573 |
| 6/30/2016 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$10,733,145 |
| 6/30/2016 | Qrt 2 | Interest Allocated to the GJGNY Program | \$1,879,665 |
| 6/30/2016 | Qrt 2 | RGGI Auction Proceeds | \$964,243,106 |
| 9/30/2016 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$12,388,468 |
| 9/30/2016 | Qrt 3 | Interest Allocated to the GJGNY Program | \$1,894,084 |
| 12/31/2016 | Qrt 4 | Interest Allocated to the RGGI Portfolio | \$12,752,158 |
| 12/31/2016 | Qrt 4 | Interest Allocated to the GJGNY Program | \$1,930,606 |
| 12/31/2016 | Qrt 4 | RGGI Auction Proceeds | \$997,676,720 |

Table E-1 continued

| Quarter End Date | Quarter | Fund Category | Cumulative Funds (\$) |
|-------------------------|----------------|--|------------------------------|
| 3/31/2017 | Qrt 1 | Interest Allocated to the RGGI Portfolio | \$12,947,487 |
| 3/31/2017 | Qrt 1 | Interest Allocated to the GJGNY Program | \$1,963,338 |
| 3/31/2017 | Qrt 1 | RGGI Auction Proceeds | \$1,014,263,135 |
| 06/30/2017 | Qrt 2 | Interest Allocated to the RGGI Portfolio | \$13,151,561 |
| 06/30/2017 | Qrt 2 | Interest Allocated to the GJGNY Program | \$1,993,273 |
| 06/30/2017 | Qrt 2 | RGGI Auction Proceeds | \$1,043,395,845 |
| 09/30/2017 | Qrt 3 | Interest Allocated to the RGGI Portfolio | \$13,151,561 |
| 09/30/2017 | Qrt 3 | Interest Allocated to the GJGNY Program | \$1,993,273 |
| 09/30/2017 | Qrt 3 | RGGI Auction Proceeds | \$1,067,446,147 |

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

Key accomplishments:

- In total, 440 RGGI-funded projects were completed.

F.1.2 Municipal Water and Wastewater Program

The Municipal Water and Wastewater Program provided a unique opportunity to coordinate RGGI climate change goals and funding with American Recovery and Reinvestment Act (ARRA) and the EPA goals and funding while installing infrastructure to improve the environment and keep NYS waters clean and healthy. This program was co-managed by the NYS Environmental Facilities Corporation (EFC) and NYSERDA. EFC secured ARRA and Green Project Reserve Funds from the EPA to bolster efforts to finance wastewater infrastructure via the Clean Water State Revolving Fund Program. Wastewater plants installed through the program are energy efficient, thus minimizing carbon emissions and improving their economic and environmental performance.

Selected projects received RGGI-funded technical analyses to identify costs and savings associated with energy efficiency, process improvement, and carbon abatement opportunities in support of EPA-funded grants and financing for plant upgrades. The program was one of five national recipients of the States Stepping Forward Program Award for excellence by the American Council for an Energy-Efficient Economy.

Key accomplishments:

- Technical energy analyses completed for projects in 59 communities.
- Communities have installed systems resulting in annual savings of 19,503 MWh and 51,425 MMBtu.
- New York City was still installing systems, which will result in additional annual savings of 13,336 MWh.

F.1.3 Multifamily Carbon Emission Reduction Program

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

Key accomplishments:

- In total, 144 multifamily buildings have converted from burning #6 oil to cleaner alternatives, primarily natural gas or a blend of natural gas and #2 oil, through the Multifamily Carbon Emissions Reduction Program.

F.1.4 Economic Development Growth Extension Program (EDGE)

The EDGE Program facilitated by Regional Outreach Contractors performs on-the-ground outreach, education, and marketing of NYSERDA program opportunities to residents, businesses, institutions, and local governments across the State to promote the value of energy efficiency, sustainable growth practices, clean energy technologies, and innovations using carefully constructed public-private partnerships. The program aligns with 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. NYSERDA is providing a greater level of education and adoption of energy efficiency and renewable energy practices at the community level.

The EDGE Program concluded April 30, 2016. In August of 2016, NYSERDA launched the Clean Energy Communities Program, which builds upon the successes of the EDGE Program. The Clean Energy Community Program provides grants, direct technical support to communities, and recognition to local governments that demonstrate leadership in the area of clean energy.

Key accomplishments:

- A total of 1,102 partnerships were developed that may help to identify and assist in customer engagement.
- A total of 1,489 public outreach activities, such as events, presentations, or other speaking engagements were conducted.
- A total of 4,117 projects were referred to various NYSERDA programs.
- A total of 3,215 project referrals from partners were received.

F.1.5 Emerging Technology/Accelerated Commercialization Program

NYSERDA's Emerging Technology/Accelerated Commercialization (ETAC) initiative seeks to accelerate market uptake of commercially available, but underused building technologies and strategies, in the residential sector that will deliver significant and measurable energy savings and GHG emissions reductions. While NYSERDA recognizes the significant value in the ETAC program and its alignment with RGGI investment objectives, funds previously allocated to this program were repurposed for other initiatives. The ETAC program continues to seek to identify and overcome barriers to full market adoption of new and/or underutilized technologies through other NYSERDA program resources.

F.1.6 Climate Smart Communities

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

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

Key accomplishments as of this quarter:

- NYSERDA is continuing to work with the Joint Utilities to develop a path forward to building out the Utility Energy Registry, a statewide platform designed to collect aggregated energy use data for communities on an ongoing basis.

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.¹⁵ An update to the 2013 study was completed in two phases in the fourth quarter of 2016. This update is available on NYSERDA's website.¹⁶

F.2.2. Multifamily Performance Program Process/Market Evaluation

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.¹⁷

F.2.3. Multifamily Performance Program Impact Evaluation

A major Impact Evaluation of the SBC/EEPS-funded MPP assessed the effects of RGGI fuel efficiency incentives. The work included measurement and verification of energy savings, and attribution analysis of projects completed from 2009 through 2011. The finalized study is available on NYSERDA's website.¹⁸

¹⁵ The GJGNY jobs quantification studies, Phase 1 and Phase 2, are on NYSERDA's website: [nyserderda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/NYE\\$-Evaluation-Contractor-Reports/2013-Reports/NMR-Group.aspx](http://nyserderda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/NYE$-Evaluation-Contractor-Reports/2013-Reports/NMR-Group.aspx)

¹⁶ Assessment of Job Impacts of the Green Jobs-Green New York Program (Phase 1), <https://www.nyserderda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-Jobs-Analysis-Phase-I.pdf>. Economic Impacts of the Green Jobs-Green New York Program (Phase 2), <https://www.nyserderda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-Jobs-Analysis-Phase-II.pdf>

¹⁷ Multifamily Performance Program/Process Evaluation and Market Characterization, nyserderda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2014-MPP-Process-Evaluation.pdf

¹⁸ Multifamily Performance Program Impact Evaluation (2009–2011), nyserderda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Evaluation-Contractor-Reports/2015-Reports

F.2.4. Economic Development Growth Extension Process Evaluation

A Process Evaluation for this program was finalized in the third quarter of 2015 and published on the NYSERDA website.¹⁹

F.2.5. Multifamily Carbon Emission Reduction Program

An Impact Evaluation for this program measured and verified the energy and emission effects attributable to the program. This evaluation was completed in the fourth quarter of 2015. The final report is available on NYSERDA's website.²⁰

F.2.6. GJGNY Small Commercial Energy Efficiency Program

NYSERDA conducted 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 was finalized in December 2015 and reported 44% of the recommended energy savings were implemented. The final report is available NYSERDA's website.²¹

F.2.7. Cleaner Greener Communities (CGC) Program

A process evaluation of NYSERDA's CGC program was completed in two waves and finalized in the second quarter of 2016. Wave One of this evaluation research was completed revealing a number of opportunities for NYSERDA to help regions implement their Phase I plans and achieve their sustainability goals. Wave Two revealed opportunities for communities to overcome common barriers to engaging in efficiency and sustainability activity and to encourage further investment in sustainability across the State's diverse regions. A summary of the findings from Waves One and Two are posted on NYSERDA's website.²²

¹⁹ Economic Development Growth Extension Process Evaluation, nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/economic-development-growth-extension-process-evaluation.pdf

²⁰ RGGI Multifamily Carbon Emissions Reduction Program Impact Evaluation (2011–2012); nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/MCERP_IMPT_RP_FINAL.pdf

²¹ GJGNY Small Commercial Energy Efficiency Program, nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Small-Comm-Impact-Evaluation-July-2010-December-2013.pdf

²² Wave 1 Study: nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2014ContractorReports/2016-Cleaner-Greener-Communities-Market-Evaluation-Wave1-Findings.pdf. Wave 2 Study: nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-Cleaner-Greener-Communities-Market-Evaluation-Wave2.pdf

F.2.8. GJGNY Constituency-Based Organization (CBO) Program

The assessment of CBO-related activities is complete. This assessment was coordinated with HPwES process evaluation and includes surveys with CBO-affiliated HPwES participants, partial participants (GJGNY audit recipients), and contractors. This study was finalized in the fourth quarter of 2015 and is available on NYSERDA's website.²³

F.2.9. Home Performance with ENERGY STAR Program

A Process/Market Evaluation of the SBC/EEPS-funded HPwES was utilized to assess the RGGI fuel efficiency incentive activity and GJGNY assessment/loan activity. This Process/Market Evaluation study was completed in Q4 2015 and is available on NYSERDA's website.²⁴

HPwES Program: An Impact Evaluation of the Green Jobs - Green New York "assessment only" participants was completed in the fourth quarter of 2016. This evaluation assessed the impacts of those who received a GJGNY-funded audit and installed measures on their own in the absence of incentives.²⁵

The impact evaluation of HPwES unregulated fuels²⁶ projects was finalized in the fourth quarter of 2016 and published on NYSERDA's website.²⁷ The projects (completed in 2011 through 2013) encompassed 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.

²³ GJGNY Constituency-Based Organization (CBO) Program, <http://www.nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-CBO-Outreach-Program-Process-Evaluation.pdf>

²⁴ Home Performance with ENERGY STAR Process Evaluation/Market Characterization Assessment Final Report (2012–2013), nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2012-2013-HPwES-Process-Evaluation-Market-Characterization-Assessment-FinalReport.pdf

²⁵ Home Performance with ENERGY STAR Program Impact Evaluation Report, Green Jobs - Green New York Audit-Only Impact Evaluation (PY 2010–2013), nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/HPwES-IE-Report-Vol4.pdf

²⁶ "Unregulated fuels" refer to fossil fuels (i.e., primarily fuel oil, propane, and kerosene) that are not provided by a regulated utility.

²⁷ Home Performance with ENERGY STAR: Unregulated Fuels Impact Evaluation (2011–2013), nysesda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/HPwES-unregulated-fuels-impact-evaluation.pdf

F. 2.10. Green Jobs – Green New York Jobs Quantification Study

Green Jobs - Green New York Jobs Quantification Study: An update to the 2013 study on this topic was completed in the fourth quarter of 2016. This study quantified direct, indirect, and induced jobs created or retained from the GJGNY program, including those in disadvantaged communities. The study examined changes in worker skill level and wages resulting from GJGNY. The results of the two phases of this study are available on NYSERDA's website.²⁸

F.2.11. Advanced Transportation Research Program

A Logic Model for this program was completed in Q3 2015 and published on the NYSERDA website.²⁹ Six Impact/Market Impact case studies for a select group of program-supported technologies were completed in Q1 2017 and published on the NYSERDA website.^{30,31,32,33,34,35}

F.2.12. Community Solar NY Program

A Logic Model report for this program was finalized in Q3 2015 and published on the NYSERDA website.³⁶

²⁸ Assessment of Job Impacts of the Green Jobs-Green New York Program (Phase 1), <https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-Jobs-Analysis-Phase-I.pdf>
Economic Impacts of the Green Jobs - Green New York Program (Phase 2), [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-Jobs-Analysis-Phase-II.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-Jobs-Analysis-Phase-II.pdf)

²⁹ NYSERDA Transportation Program Logic Model Report, [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Transportation-LM-Report.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Transportation-LM-Report.pdf)

³⁰ [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-Transportation-Case-Study-Buffalo-Niagara-Medical-Campus.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-Transportation-Case-Study-Buffalo-Niagara-Medical-Campus.pdf)

³¹ [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-transportation-case-study-electric-refrigeration.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-transportation-case-study-electric-refrigeration.pdf)

³² [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Alstom-Transportation-cs.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Alstom-Transportation-cs.pdf)

³³ [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Saab-Sensis-Advanced-Airport-Departure-Manager-Transportation-cs.PDF?la=en](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Saab-Sensis-Advanced-Airport-Departure-Manager-Transportation-cs.PDF?la=en)

³⁴ [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Adaptive-Control-Decision-Support-System-Traffic-Management-Transportation-cs.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/Adaptive-Control-Decision-Support-System-Traffic-Management-Transportation-cs.pdf)

³⁵ [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Transportation-Case-Study-Report-Leviton.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Transportation-Case-Study-Report-Leviton.pdf)

³⁶ Community Solar NY Program: Final Initiative-Level Logic Model Report, [nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Community-Solar-NY-Final-Initiative-Level-Logic-Model-Report.pdf](https://www.nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Community-Solar-NY-Final-Initiative-Level-Logic-Model-Report.pdf)

F.2.13 Residential Non-Energy Impact Study

A study was conducted to identify and begin to quantify measurable non-energy effects from residential programs, including HPwES and the Green Residential Building Program. This study was jointly supported with RGGI and other NYSERDA funds. The major results show that insulation, ENERGY STAR® home design, and air sealing measures are the readiest for a cost-effective primary research effort to further substantiate their related NEI values for enhancing program design, marketing efforts, and cost-benefit analysis. The study was finalized in Q1 2017 and is posted on NYSERDA's website.³⁷

F.2.14. Wastewater Energy Efficiency Program

An impact evaluation of the Wastewater Efficiency Program was completed in the first quarter of 2017. The Program provided objective and customized energy-related information and opportunities to customers that targeted the customer's specific energy and business needs. The impact evaluation confirmed the study-recommended savings that customers adopted. The study is available on NYSERDA's website.³⁸

F.2.15. Advanced Transportation Research

An impact evaluation of the Wastewater: A Logic Model for this program was completed in Q3 2015 and is posted on NYSERDA website.³⁹

F.2.16. Advanced Transportation Research

A Market Characterization Assessment of the Transportation Program was completed in the second quarter of 2017. This assessment focused on three areas: electric vehicles, public transportation, and mobility management. "Mobility management" encompasses a variety of strategies designed to reduce transportation demand and congestion, including intelligent and adaptive transportation systems and transportation demand management. This market assessment includes a description of the current state of the clean transportation market in the State and the identification of remaining barriers to adoption in key

³⁷ Quantification of Non-Energy Impacts for Residential Programs Phase 1: Final Report, nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/SmallResidential-NEI-PhaseI.pdf

³⁸ Wastewater Efficiency Program Impact Evaluation (2009 - 2011), nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/WWEP-Impact-Evaluation-Final-Report.pdf

³⁹ NYSERDA Transportation Program Logic Model Report, nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Transportation-LM-Report.pdf

market segments that will be used for planning and strategy development by the Transportation Program. The findings of this assessment are provided a five-volume market characterization analysis of clean transportation in the State and available on the NYSERDA website.⁴⁰

F.2.16. Clean Energy Business Development

A Market Characterization of NYSERDA's Clean Energy Business Development (CEBD) program was finalized in the second quarter of 2017. This evaluation research found that the NYS cleantech ecosystem is vibrant, with many active early-stage companies commercializing cleantech innovations, and a rich array of resources is available to support the NYS entrepreneurial ecosystem. While there are many early-stage companies, they face significant hurdles in growing at the speed and scale that may be possible. Access to resources is uneven and can be time-consuming, which can impede company growth. A summary of the findings from this research are posted on NYSERDA's website.⁴¹

F.2.17. Power Systems Program

An Impact Evaluation of the Clean Power Technology Innovation (CPTI) program, previously known as the Power Systems program, was completed in the second quarter of 2017. This evaluation was conducted in two phases. Phase 1 included a review of the contracts funded by CPTI to better understand the scope of funding recipients and to prioritize activities for Phase 2. The Phase 2 research consisted of an in-depth investigation of three Core Product technologies identified during Phase 1: PV, wind, and energy storage. The maturation of the products funded by the program, as well as the grantees' perceptions of the value of NYSERDA funding, operational activities, and project support were evaluated. Findings from this research are posted on NYSERDA's website.⁴²

⁴⁰ Clean Transportation Market Characterization Study, nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/Clean-Transportation-Market-Characterization-Study-Vol2.pdf. Additional volumes of this study, including the Executive Summary, Electric Vehicles and Transportation Demand Management Market Characterization and Baseline Assessments and report appendices can be found here under the Clean Transportation Market Characterization Study heading: nyserdera.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Evaluation-Contractor-Reports/2017-Reports.

⁴¹ NYSERDA Innovation Capacity and Business Development (ICBD) program (formerly the Clean Energy Business Development program) market characterization and assessment report, nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/ICBD-MCA-Final-Report.pdf

⁴² NYSERDA Power Systems Program and Clean Power Technology Innovation Program: Impact Evaluation, nyserdera.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2017ContractorReports/2017-05-CleanPowerTechnologyInnovationImpactEvaluationReport.pdf

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

17 Columbia Circle
Albany, NY 12203-6399

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

info@nyserdera.ny.gov
nyserdera.ny.gov



State of New York

Andrew M. Cuomo, Governor

New York State Energy Research and Development Authority

Richard L. Kauffman, Chair | Alicia Barton, President and CEO