NEW YORK STATE OF OPPORTUNITY. | NYSERDA

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

Quarter Ending September 30, 2016

Final Report

January 2017

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.

NYSERDA Record of Revision

Document Title
New York's Regional Greenhouse Gas Initiative-Funded Programs Status Report Quarter Ending September 30, 2016 Final Report January 2017

Revision Date		
January 2017	Original publication	

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New York State Energy Research and Development Authority

January 2017

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Acronyms and Abbreviations

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

1 Introduction

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 (CO_2) Budget Trading Program (6 NYCRR Part 242, 6 NYCRR Part 200, General Provisions), and the New York State Energy Research and Development Authority (NYSERDA) established the CO_2 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, 2016. 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 NYSERDA's Board on June 18, 2015.

The State invests RGGI proceeds to support comprehensive strategies that best achieve the RGGI CO_2 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 (CO_2e) reductions, energy savings, and participant energy bill savings.[1] For more information on the methodology used to calculate CO_2e 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, which will include these metrics along with macroeconomic indicators such as job creation resulting from program activity. 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 some 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, 2016.

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1 These metrics represent the benefits that can be discretely counted at this time, and that 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.

Key observations during this quarter:

- Electric energy efficiency comprised 37 percent of energy savings, 32 percent of emission reductions, and 32 percent of bill savings.
- Renewable electric generation comprised 30 percent of energy savings, 25 percent of emission reductions, and 25 percent of bill savings.
- Energy savings from electric energy efficiency and renewable electric generation are a larger percentage than the emissions reductions and bill savings from electric energy efficiency and renewable electric generation 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 21 percent of energy savings, 25 percent of emission reductions, and 24 percent of bill savings. Distillate #2 oil achieves a larger share of the emission reductions and participate 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 23 percent of energy savings, 27 percent of emission reductions, and 18 percent of bill savings. Residual #6 oil achieves a larger share of the emission reductions and a smaller share of participate 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 negative 12 percent of energy savings, negative 10 percent of emission reductions, and less than negative one percent of bill savings. Fuel switching projects that save the dirtier and more expensive distillate or residual oil by consuming more of the cleaner and cheaper natural gas.
- Other fuels (including propane, steam, wood, kerosene, and coal) comprised one percent of energy savings, one percent of emission reductions, and one percent of bill savings.

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

Table 1. Summary of Expected Cumulative Portfolio Benefits through September 30, 2016

Benefits through September 30, 2016[a]	Net Greenhouse Gas Emission Savings[b] (Tons CO_2e[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]	502,987	2,197,233	251,124	198,807	449,931	$144.2
Cumulative Annualized Pipeline Savings[e]	77,163	477,180	20,057	54,516	74,573	$22.1
Cumulative Annualized Committed Savings[f]	580,150	2,674,413	271,180	253,323	524,504	$166.3
Expected Lifetime Total Savings[g]	11,260,764	53,905,191	4,504,760	5,978,653	10,483,414	$3,248.2

[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-users' responsibility or footprint associated with emissions from electricity production.

[c] CO_2e stands for carbon dioxide equivalent and describes the amount of CO_2 that would have the same global warming potential as a given mixture of gases based on factors published by the Intergovernmental Panel on Climate Change.

[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, 2016

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_2e[b])			Cost Benefit Ratio ($/Ton CO_2e)	
	Total Incentives[c]	Total Associated Costs[d]	Installed Savings[e]	Pipeline Savings[f]	Total Committed Savings[g]	$/MMBtu Savings[h]	$/MMBtu EXPECTED LIFETIME Savings[i]	Installed Savings[e]	Pipeline Savings[f]	Total Committed Savings[g]	$/MWh Savings[h]	$/MWh EXPECTED LIFETIME Savings[i]	Installed Savings[e]	Pipeline Savings[f]	Total Committed Savings[g]	$/Ton CO2e Savings[h]	$/CO2e EXPECTED LIFETIME Savings[i]
Green Jobs - Green New York																	
One- to Four-Family Residential Buildings Program Assessments[j]	$26.2	$1.0	951,034	233,460	1,184,494	23	1	11,990	2,449	14,438	1,881	105	75,481	18,279	93,760	290	12
One-to Four-Family Residential Buildings Program Financing[j]	$92.8	$11.7	558,087	64,677	622,764	168	7	60,972	7,063	68,035	1,536	81	76,021	8,808	84,830	1,232	58
Multifamily Performance Program Assessments[j]	$3.4	$1.4	700,365	125,753	826,118	6	0.4	49,734	4,145	53,879	89	7	73,652	10,717	84,369	57	4
Small Commercial Energy Efficiency Program Financing[j]	$1.2	$0.2	7,144	-	7,144	207	10	639	-	639	2,319	178	814	-	814	1,820	105
Energy Efficiency																	
LIPA Energy Efficiency and Renewable Energy Initiative	$79.8	-	-	-	-	-	-	194,805	-	194,805	410	22	112,987	-	112,987	706	37
Multifamily Performance Program[k]	$16.2	$2.0	353,052	192,741	545,793	33	2	18,961	10,129	29,090	623	48	37,732	20,470	58,202	312	21
Multifamily Carbon Emissions Reduction Program[l,m]	$5.7	$0.2	-	-	-	-	-	-	-	-	-	-	45,151	-	45,151	129	10
EmPower New York	$25.9	$1.4	142,587	5,650	148,237	185	8	-	-	-	-	-	10,550	442	10,992	2,490	104
Home Performance with ENERGY STAR®	$18.7	$1.7	307,956	4,618	312,574	65	3	1,748	28	1,776	11,476	638	25,830	382	26,213	778	33
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	12,498	868	13,366	321	16	22	1	23	-	9,319	935	65	1,000	4,298	215
Low-Rise Residential New Construction Program[n]	$0.8	-	7,385	4,284	11,669	72	3	-	-	-	-	-	506	293	799	1,056	44
Renewable Energy																	
Renewable Heat New York	$0.3	$0.04	1,539	522	2,061	185	9	78	24	102	3,735	187	262	84	346	1,102	55
NY-Sun Initiative	$53.2	$0.11	-	-	-	-	-	143,184	55,303	198,487	268	11	83,046	32,076	115,122	463	19
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	$7.8	-82,448	5,502	-76,946	-112	-6	-	3,735	3,735	2,306	128	35,467	2,490	37,957	227	13
Clean Energy Fund																	
Clean Energy Fund[p]	$0.7	$0.11	1387	10,208	11,595	70	4	60	1,207	1,267	643	39	123	1,295	1,418	574	35
Cross-Program Overlap[q]	N/A	N/A	-799,901	-171,103	-971,004	N/A	N/A	-35,874	-9,512	-45,386	N/A	N/A	-79,838	-18,239	-98,077	N/A	N/A
TOTAL Annualized Cumulative Benefits[r]	**$337.6**	**$28.1**	**2,197,233**	**477,180**	**2,674,413**	**137**	**N/A**	**449,931**	**74,573**	**524,504**	**697**	**N/A**	**502,987**	**77,163**	**580,150**	**630**	**N/A**
TOTAL Expected Lifetime Cumulative Benefits[s]	**$337.6**	**$28.1**	**44,893,113**	**9,012,078**	**53,905,191**	**N/A**	**7**	**8,863,378**	**1,620,036**	**10,483,414**	**N/A**	**35**	**9,678,811**	**1,581,954**	**11,260,764**	**N/A**	**32**

Table notes are on the next page

Table 2 continued

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

[b] CO_2e stands for carbon dioxide equivalent and describes the amount of CO_2 that would have the same global warming potential as a given mixture of gases based on factors published by the Intergovernmental Panel on Climate Change.

[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.

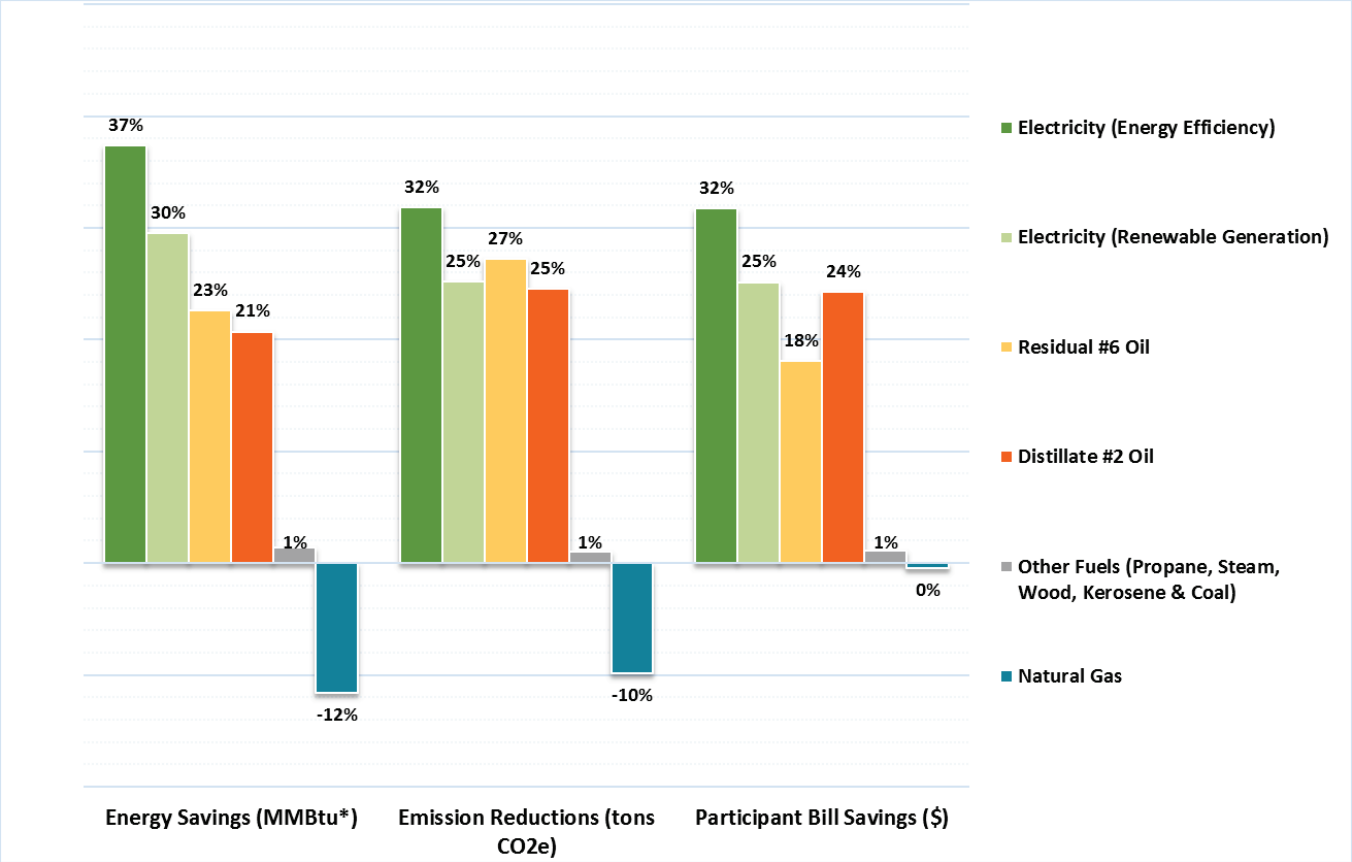
[o] The Regional Economic Development and GHG Reduction program consists of 15 unique projects. The costs for all 15 projects are included in this table although only a subset of these projects actually report quantifiable energy benefits. The negative MMBtu savings are due to a manufacturing project 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 through September 30, 2016[3]



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

[3] Columns may not sum exactly to 100 percent due to rounding.

3 Funds

3.1 Proceeds

As of September 30, 2016, NYS sold nearly 318 million CO_2 allowances and received nearly than $977.5 million in auction proceeds. In addition, nearly $12.4 million in interest was earned on the RGGI portfolio and nearly $1.9 million in interest was earned on the Green Jobs - Green New York (GJGNY) program. Nearly $9.1 million in interest earnings were allocated on the RGGI portfolio and nearly $1.8 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, 2016[a]

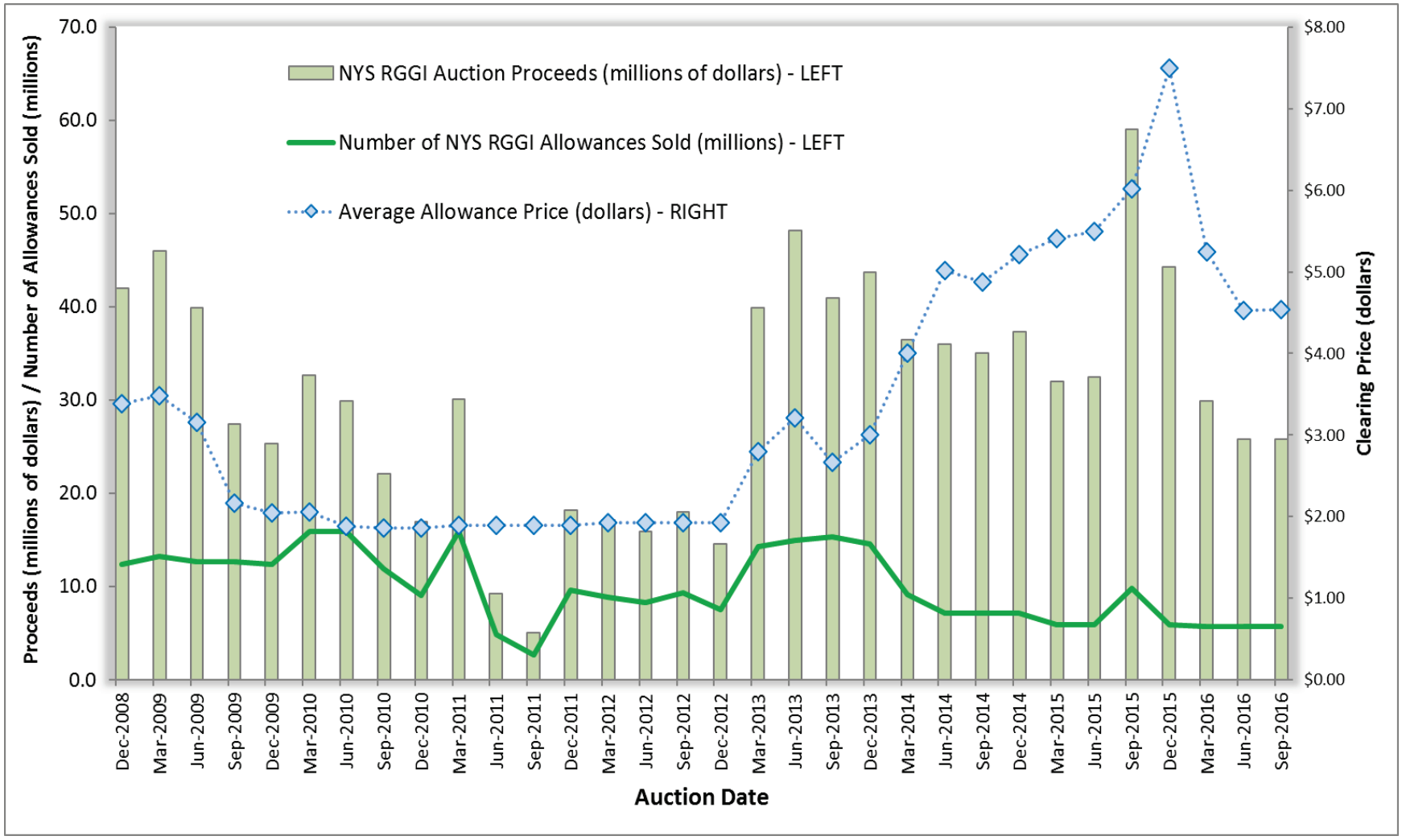
Source: RGGI, Inc. and NYSERDA

Fund Category	NYS Allowances Sold	Cumulative Funds
First Control Period Total	144,305,904	$336,282,535
Second Control Period Total	128,764,643	$391,950,232
Third Control Period Total	44,594,375	$249,238,169
RGGI Auction Proceeds	**317,664,922**	**$977,470,936**
RGGI Portfolio Interest Earnings		$12,388,468
GJGNY Program Interest Earnings		$1,894,084
TOTAL Funds		**$991,753,488**

[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.

Figure 2. New York State's RGGI Auction Results through September 30, 2016

Source: RGGI, Inc.



3.2 Budget

Financial data for the approved RGGI programs through September 30, 2016, are presented in Table 4 through Table 6. Table 4 presents the current expended, encumbered, and committed funds for each program and reflects how the more than $991.7 million of current funds are distributed across the six major program areas and other costs:

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

Table 5 and Table 6 present the financial data for the approved GJGNY program and NY Green Bank, respectively, through September 30, 2016.

Table 4. Available Funding and Financial Status through September 30, 2016 (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	4.0	3.8	1.4	9.2	1.1
NY-Sun	83.8	38.0	14.7	1.7	54.5	29.3
NYSERDA Solar Electric Programs	5.3	5.3	0.03	-	5.3	-
NY Generation Attribute Tracking	1.5	0.01	0.78	0.4	1.2	0.3
Advanced Renewable Energy	2.9	2.8	0.02	-	2.9	-
Total Renewable Energy	**103.7**	**50.2**	**19.4**	**3.5**	**73.1**	**30.7**
Energy Efficiency						
LIPA Energy Efficiency and Renewable Energy	123.1	79.8	43.3	-	123.1	-
Residential Efficiency Services	83.2	70.1	7.8	4.8	82.6	0.6
Municipal Water and Wastewater	1.2	1.2	-	-	1.2	-
Total Energy Efficiency	**207.5**	**151.1**	**51.0**	**4.8**	**206.9**	**0.6**
Innovative GHG Abatement Strategies						
Industrial Innovations	13.0	7.4	5.3	0.3	13.0	-
Climate Research and Analysis	8.6	5.9	2.2	0.1	8.1	0.5
Clean Energy Business Development	22.9	12.9	2.8	0.6	16.2	6.7
Charge NY	7.0	0.2	0.5	0.7	1.5	5.5
Transportation Research	5.3	2.5	0.42	2.4	5.3	-
Carbon Capture and Sequestration	1.0	1.0	-	-	1.0	-
Advanced Buildings	1.6	1.1	0.4	-	1.5	0.1
Competitive Greenhouse Gas Reduction Pilot	2.5	0.4	0.6	1.5	2.5	-
Brookhaven National Laboratory Ion Collider	25.0	-	-	25.0	25.0	-
Total Innovative GHG Abatement Strategies	**87.0**	**31.3**	**12.3**	**5.6**	**49.2**	**12.8**
Community Clean Energy						
Climate Smart Communities	7.3	4.3	0.2	-	4.4	2.9
Economic Development Growth Extension	7.2	4.9	0.5	0.1	5.4	1.8
Cleaner, Greener Communities	99.5	23.2	57.6	18.7	99.5	-
Clean Energy Communities	4.5	-	-	-	-	4.5
Regional Economic Development and Greenhouse Gas Reductions	10.3	8.7	1.6	-	10.3	-
REV Campus Competition	3.0		1.0	2.0	3.0	-
Total Community Clean Energy	**131.9**	**41.1**	**60.8**	**20.8**	**122.7**	**9.2**
Other Costs [g]						
Deficit Reduction Plan (DRP) Transfer [h]	90.0	90.0	-	-	90.0	-
Con Edison Smart Grid Program [i]	22.9	22.9	-	-	22.9	-
Program Administration [j]	23.0	22.0	0.07	-	22.1	1.0
Metrics and Evaluation	13.9	3.5	2.6	5.7	11.8	2.1
RGGI Inc. Costs [k]	7.0	6.7	0.2	-	7.0	-
New York State Cost Recovery Fee	13.8	7.4	-	-	7.4	6.4
Allocation Surplus/(Deficit)[l]	(6.9)	-	-	-	-	(6.9)
Environmental Tax Credit	41.0	41.0	-	-	41.0	-
OTHER COSTS TOTAL	**204.7**	**193.5**	**2.9**	**5.7**	**202.1**	**2.6**
SUBTOTAL	**734.8**	**467.3**	**146.4**	**65.3**	**679.0**	**55.8**
Green Jobs - Green New York						
Green Jobs - Green New York	191.5	158.9	6.2	28.0	193.0	(1.5)[m]
NY Green Bank						
NY Green Bank	52.9	32.9	15.3	3.6	51.8	1.2
Clean Energy Fund						
Clean Energy Fund	12.5	0.3	0.7	-	1.0	11.5
TOTAL[n]	**991.8**	**659.0**	**167.8**	**96.9**	**923.7**	**57.0**

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 CO_2 Budget Trading Program, the CO_2 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 CO_2 Budget Trading Program.

[l] Allocation deficit will be covered out of future proceeds

[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 allocated in the FY16-17 RGGI Operating Plan and 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, 2016 (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	6.4	0.4	-	6.8	0.6
Outreach and Marketing	15.4	14.4	1.0	-	15.4	0.0
Total Workforce Development, Outreach and Marketing	**22.8**	**20.8**	**1.4**	**-**	**22.2**	**0.6**
Residential						
Energy Assessment Incentive	26.9	25.0	-	1.6	26.6	0.2
Implementation Costs	1.0	1.0	-	-	1.0	0.00
Financing: Loans	100.6	204.3	-	24.0	228.3	
Financing: Loan Repayments	-	(16.2)	-	-	(16.2)	
Financing: Implementation Costs	-	10.2	0.1	0.4	10.8	
Financing: Bond Proceeds	-	(89.2)	-	-	(89.2)	
Financing: Bond Issue Costs	-	2.9	0.1	-	3.0	
Financing: Short Term Note	-	(30.0)	-	-	(30.0)	
Total Financing	**100.6**	**82.1**	**0.2**	**24.4**	**106.7**	**(6.2)[g]**
Total Residential	**128.4**	**108.1**	**0.2**	**26.0**	**134.4**	**(5.95)[g]**
Multifamily						
Energy Assessments	3.3	3.0	0.3	-	3.3	0.0
Implementation Costs	1.4	1.4	0.0	-	1.4	0.0
Financing: Loans	3.5	3.9	0.06	-	3.9	
Financing: Loan Repayments	-	(2.2)	-	-	(2.2)	
Financing: Implementation Costs	0.3	0.2	0.2	-	0.3	
Total Financing	**3.8**	**1.9**	**0.2**	**-**	**2.1**	**1.7**
Total Multifamily	**8.5**	**6.3**	**0.5**	**-**	**6.8**	**1.7**
Small Commercial						
Energy Assessments	8.6	6.4	2.2	-	8.6	0.0
Implementation Costs	1.0	0.8	0.2	-	1.0	0.0
Financing: Loans	3.8	1.5	-	-	1.5	
Financing: Loan Repayments	-	(0.3)	-	-	(0.3)	
Financing: Implementation Costs	0.3	0.2	0.3	0.9	1.4	
Total Financing	**4.1**	**1.5**	**0.3**	**0.9**	**2.6**	**1.4**
Total Small Commercial	**13.7**	**8.7**	**2.7**	**0.9**	**12.3**	**1.4**
SUBTOTAL	**173.5**	**143.9**	**4.8**	**26.9**	**175.7**	**(2.2)[g]**
Other Costs						
Program Administration	10.2	9.7	0.0	-	9.7	0.5
Program Evaluation	5.6	3.2	1.3	1.1	5.5	0.1
New York State Cost Recovery Fee	2.1	2.1	-	-	2.1	0.0
Unallocated Interest Earnings	0.1	-	-	-	-	0.1
OTHER COSTS TOTAL	**18.0**	**14.9**	**1.3**	**1.1**	**17.3**	**0.7**
TOTAL[h]	**191.5**	**158.9**	**6.2**	**28.0**	**193.0**	**(1.5)[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 allocated in the FY16-17 RGGI Operating Plan and 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, 2016 (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	29,871	14,380	2,795	47,046	522
SUBTOTAL	**47,567**	**29,871**	**14,380**	**2,795**	**47,046**	**522**

	Budgeted Funds	Expenses[g]	Open Encumbrances[h]	Pre-Encumbrances[i]	Committed Funds[j]	Remaining Balance[f]
Other Costs						
Operating Expenses (Program Administration)	4,234	2,940	872	97	3,909	326
Program Evaluation	969	13	-	727	740	229
New York State Cost Recovery Fee	156	60	-	-	60	96
OTHER COSTS TOTAL	**5,359**	**3,014**	**872**	**823**	**4,709**	**650**

	Budgeted Funds	Deployed Funds plus Expenses	Committed Capital plus Open Encumbrances	Approved Investments plus Pre-Encumbrances	Committed Funds	Remaining Balance
TOTAL[k]	**52,926**	**32,885**	**15,252**	**3,619**	**51,755**	**1,172**

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 & 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 NYS.

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

Revised incentive levels remain in effect to stimulate the market and apply to all units installed prior to September 30, 2016. NYSERDA will assess the incentive level after that based on market factors and adjust accordingly.

Key accomplishments as of this quarter:

- 23 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 NYS.
- NYSERDA has renewed the contract with the training service provider and will begin offering trainings on an as-needed basis starting in January 2017. Enrollment of qualified installers is ongoing.
- The installation of 14 pellet stoves; more than 65 projects are in process. One residential cordwood units installation as well as one residential pellet boiler; five residential cordwood and six residential pellet boiler installations are in process.
- Marketing efforts include print advertisements in 12 local and regional publications and many more potential customers through various outreach efforts including website updates, new branding for program materials, banner ads, paid search ads, education for NYSERDA's Consumer Services and Events Management and Hotline staff, and staffing at six public events with program information and marketing materials.
- 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 will drive the growth of the solar industry and make 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 coordination with the New York Power Authority (NYPA) and the NYS Education Department, the K-Solar program offers targeted resources to help schools implement solar and act as hubs for community projects.

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:

- "Solarize" campaigns participating in Community Solar NY Round 2 completed outreach and marketing activities. Round 3 of Community Solar NY opened on September 6th, with applications from communities due by November 3, 2016.
- Continued coordination with NYPA, the NYS Education Department, and other K-Solar partners to encourage participation of schools in K-Solar and local community solar outreach projects.
- Affordable Solar added incentives were available for residential installations with low-income homeowners. The added incentive matches the current MW block incentive, and launched at $0.20/W for Long Island. The added incentive is continuing after the exhaustion of the Long Island MW block, until added incentive funds are exhausted.
- 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. There were a total of 14,312 solar electric systems installations through September 30, 2016 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 a total of 153 solar electric system installations outside of Long Island using RGGI funding through September 30, 2016.

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 will be able to verify and substantiate ownership of renewable energy certificates (RECs) to either support regulatory compliance or to validate environmental attributes in trading markets. NYGATS will also characterize the attributes of electricity imports and exports, and will have the capability to interface and exchange information with other certificate tracking systems. The system will serve to substantiate compliance for Clean Energy Standard requirements. 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:

- NYGATS Phase 2, Certificate Issuance and Transfer launched on July 14, 2016. NYGATS now tracks certificates for all reported generation from January 1, 2016 and forward. Phase 2 also included additional NYGATS reports for users and the public.
- Phase 3 of NYGATS, consisting of the annual settlement process and extended reporting functionality is scheduled to launch in November of 2016.

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 has 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 draft of the final report has been received by NYSERDA and is under review.
- Offshore wind cost benefit analysis project work continues. It is expected to take additional time to complete the work.

4.2 Energy Efficiency

4.2.1 LIPA Energy Efficiency and Renewable Energy Initiative

The RGGI funds provided to LIPA ensure that businesses and consumers on Long Island have access to similar clean energy and energy efficiency opportunities that are available throughout the state and to help advance statewide efforts towards achieving the clean energy goals of the 2015 New York State Energy Plan. The funds provided to LIPA have traditionally supported solar incentive programs consistent with the statewide NY Sun program but have more recently supported energy efficiency programs administered by PSEG Long Island. During 2016, LIPA, NYSERDA and PSEGLI have 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.

Key accomplishments as of this quarter:

- There were a total of 3,079 solar electric systems and commercial efficiency projects installed using RGGI funding through the LIPA Energy Efficiency and Renewable Energy Initiative programs from inception through September 30, 2016. The net savings for these 2015 projects totaled more than 50 million kWh.

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. RGGI funds are support energy efficiency where the project or measures are ineligible for Energy Efficiency Portfolio Standard (EEPS) and the Clean Energy Fund. These funds offer incentives to implement energy efficiency measures, to supplement these resources and reach petroleum fuel opportunities, or opportunities on Long Island and municipal electric districts. Coordination of these funding sources allows for efficiency contractors to provide comprehensive energy efficiency services to the home, expands the number of households served, and ensures that opportunities for carbon reduction measures are not lost.

4.2.2.1 Multifamily Performance Program

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

Key accomplishments as of this quarter:

- Through September 30, 2016, 146 energy efficiency projects were completed, representing efficiency upgrades to 33,227 units.

4.2.2.2 Multifamily Carbon Emission Reduction Program

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

4.2.2.3 EmPower New York

NYSERDA's EmPower New York (EmPower) program offers no-cost energy efficiency services to low-income (i.e., HEAP-eligible) homeowners and renters. These services include electric reduction and home performance measures such as appliance replacement, energy-efficient lighting, insulation, and air sealing. EmPower uses RGGI funding to serve low-income applicants that heat with oil and propane and are ineligible for EEPS funding. Starting with the implementation of the Clean Energy Fund, which delivers energy efficiency in a fuel-neutral manner, RGGI funds are only used for customers served by PSEG Long Island or municipal utilities and are therefore not eligible for the CEF. Starting in 2017, PSEG Long Island will also begin to deliver services to households who heat with oil or propane. These energy efficiency measures aid in the reduction of GHG emissions and provide long-term carbon reductions. On-site energy education offers customers additional strategies for managing their energy costs. Services are provided by participating contractors that are Building Performance Institute GoldStar Contractors. Currently, 162 EmPower contractors are assisting in RGGI-funded projects.

Key accomplishments as of this quarter:

- Across NYS, 226 households were served during this quarter, bringing the total to 6,343 households served under EmPower New York to date with RGGI funding through September 30, 2016.

4.2.2.4 Green Residential Buildings Program

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

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-rise[4] 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, 2016, 168 contractors are active in HPwES. The program uses RGGI funds for cost-effective oil and propane efficiency measures, such as replacing inefficient oil and propane heating equipment and other measures that have a direct impact on reducing GHG emissions from oil and propane consumption. Starting with the implementation of the Clean Energy Fund, which delivers energy efficiency in a fuel-neutral manner, RGGI funds are only used for customers served by PSEG Long Island or municipal utilities and are therefore not eligible for the CEF. Starting in 2017, PSEG Long Island will also begin to deliver services to households who heat with oil or propane. Income-qualified homeowners are eligible for higher incentive rates to make energy improvements. HPwES applicants may also qualify for GJGNY assessment and financing programs.

[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.

Key accomplishments as of this quarter:

- During this quarter 129 energy efficiency projects were completed at a contracted value of $3.0 million, bringing the total to 8,592 energy efficiency projects completed at a contracted value of $88.3 million.
- Of these projects, 39 percent were AHPwES, which serves homeowners with incomes between 60-80 percent of State or Area median income, whichever is greater.
- In Q3 2016 twenty percent 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 Renewable Portfolio Standard (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.

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:

- Nine new solar thermal hot water systems were installed during this quarter.
- In total, 13,774 MMBtu's have been saved through 176 projects and their solar thermal contribution to domestic hot water.

4.2.2.7 Low-rise Residential New Construction Program

NYSERDA's Low-rise Residential New Construction Program[5] (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, 22 builders have constructed homes eligible for RGGI incentives so far.

Key accomplishments as of this quarter:

- One new dwelling unit was constructed, bringing the cumulative total of new dwelling units constructed to date to 179.
- $5,214 of additional private sector funds were leveraged, bringing the program total to date to $830,974.
- RGGI funds for the LRNCP were fully committed in Q3 2015.

4.2.2.8 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 for homes and residential buildings. Funded primarily through the Technology and Market Development (T&MD) portfolio, ETAC seeks to identify and overcome barriers to full market adoption of new and/or underutilized technologies.

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[5] 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.

Key accomplishments as of this quarter:

- Up to $500,000 in RGGI funds were made available to add to T&MD funding for Program Opportunity Notice 3127, Emerging Technologies Demonstration Projects – Residential HVAC. The RGGI funding serves to make demonstrations sites statewide eligible to participate in this PON. Five proposals were recommended for funding. None will be funded using RGGI funding.

4.2.3 Municipal Water and Wastewater Program

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

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 NYS 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:

- 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:

- 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 have continued to demonstrate the website to interested organizations and are continuing to discuss ways to create a self-sustaining website among themselves or with help from foundations and other interested supporters.
- Work has continued on the climate change adaptation research projects. Several conferences in this quarter held presentations on many of our completed climate tools.
- NYSERDA staff continued to participate in an interagency working group to coordinate efforts on the Community Risk and Resiliency Act (CRRA). NYSERDA will continue to engage with this group, offering suggestions and support when appropriate. The DEC put forth the updated NYSERDA-supported ClimAID projections for NYS as the proposed sea level rise projections through the CRRA process. The DEC received comments on the proposed rulemaking and are now under review.
- NYSERDA staff continued to attend meetings of the Interagency Climate Change Adaptation Workgroup. This group shares climate adaptation information and helps coordinate efforts between agencies.

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 expansion-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 NYS cleantech startups, NYSERDA is working with the impact investment group, 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 cleantech investment opportunities to IC NY members, and provide feedback to the cleantech startup 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 cleantech 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 a new component of the Clean Energy Business Development program. It 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. Going forward, the program is discussed in the Southern Tier Business Competition section of the report. 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:

- A contract was recently finalized with the Center for Mesoscale Transport Properties (m2M) with the objective to understand and enable deliberate design of materials and components to achieve higher performing, longer life, and safer batteries through acquisition of new fundamental knowledge about ion and electron transport and electron transfer properties over multiple length scales, across interfaces and over time.
- In addition to support from the RGGI program, this project involves funding from NYS Empire State Development and NY Southern Tier Regional Economic Development Council. The funds were secured in Q1 2016 and the project moved forward with the construction of a battery dry room at the Northeast Center for Chemical Energy Storage at SUNY Binghamton. The dry room is due for completion by the end of the third quarter of early in the fourth quarter of 2016.
- Investors Circle continued to hold their monthly meetings in New York City. The next scheduled event in Upstate New York is at the end of October, 2016 in Rochester.
- PVMC executed partnership agreements with three additional companies.
- PVMC, in collaboration with one of its partner manufacturers, deployed the first commercial installation of a co-developed product: the integrated module package, which is a flexible, roof-integrated PV system
- PVMC hosted a special forum at the 45th American Solar Energy Society National Solar Conference (at Intersolar North America) on July 11th titled "How the Convergence of Energy, Data Analytics, and IoT will Change the Solar Market." The objective of the meeting was to discuss how the solar industry can utilize an advanced digital strategy to improve solar system costs and efficiency while looking to seamlessly integrate solar technologies into the evolving internet-of-things (IoT) ecosystem. Panelists included representatives from M+W Energy, REC Solar, IBM, Nest Labs, and DOE.

Success story 1: New York State supports innovative cleantech companies with 76West competition

RGGI funds are enabling startup clean tech companies to either create jobs in or locate to the Southern Tier. The first round of the 76West Clean Energy Business Competition awarded $2.5 million to six companies. The products of the winning companies will reduce greenhouse gases and gas emissions, block ultraviolet radiation so buildings stay cooler and air conditioning loads are reduced, help make energy storage batteries cheaper and more environmentally friendly, and reduce energy consumption of data centers.

4.3.4 ChargeNY

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

Key accomplishments as of this quarter:

- NYSERDA is finalizing contracts with three projects funded through the Cleaner, Greener Communities program that are focused on expanding EV acceptance in communities across NYS. The scopes of projects with Calstart, Energetics, and EV Connect are being refined and are anticipated to start later in 2016.
- NYSERDA continued development of an upcoming EV rebate program, which is anticipated to launch later in 2016.
- NYSERDA's charging station deployment program is under development, with an RFP expected to be released in 2017.

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:

- NYSERDA made four awards for new product development research projects under PON 3198, two of which were funded using RGGI Transportation Research funds, totaling $414,707. NYSERDA is beginning contract negotiations with these projects.
- Bandwagon launched an integration relationship with Verifone Technologies and now has payment integration with 100 percent of New York City taxis.
- Ruby Mountain Inc. completed its feasibility study of using renewable natural gas (RNG) for transportation purposes. Its report identified a number of opportunities for fleets to use RNG for transportation and take advantage of existing programs to enhance the economics. NYSERDA is investigating future opportunities to demonstrate the business models identified.
- Calstart completed its feasibility report investigating opportunities to retrofit parcel delivery trucks with affordable electric drivetrains. Its partner, a major parcel delivery company, is interested in continuing the work. NYSERDA awarded the project additional funds under PON 3198.

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, completed installations on short-line railroads around the State in time to use the auxiliary powered units (APUs) during the cold weather months. Six APUs were in operation all winter, 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, NY. TriCarb is leveraging NYSERDA funding with more than $8 million of U.S. Department of Energy funds to investigate the potential for geological sequestration in the Newark Basin.

Key accomplishments as of this quarter:

- All lab work and analysis for the TriCarb project is complete. The project is continuing with the reporting phase.

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:

- A study to evaluate the Dutch program for deep energy retrofits of residential buildings known as Transition Zero is underway. The Transition Zero concept utilizes pre-fabricated envelope panels with integrated mechanicals and renewables to retrofit existing buildings. Combined with innovated financing and billing, the Transition Zero concept offers an interesting approach to deep energy retrofits of buildings. With over 80 percent of buildings built before the establishment of the first energy, the retrofit potential significantly large. The objectives of this study are as follows: gain an in-depth understanding of the solutions implemented under Transition Zero; confirm the cost and performance of the implemented retrofits; assess transferability to NYS building stock (e.g., wood-frame vs. concrete frame) and assess transferability to NYS different climate zones.

4.3.8 Competitive Greenhouse Gas Reduction Pilot

This pilot program supports market-ready projects that reduce GHG emissions at electric generating facilities in the State. The projects selected are 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 is anticipated that projects could include, but are not limited to, supply-side energy efficiency and advanced controls resulting in cost-effective GHG emissions reductions.

Key accomplishments as of this quarter:

- The Technical Evaluation Panel (TEP) and Team meetings were held to review proposals submitted under the 2nd RFP for the Competitive Greenhouse Gas Reduction Pilot Program (RFP 3172). The program did not award any funding under the second RFP.

4.4 Community Clean Energy

4.4.1 Climate Smart Communities

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

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

Success story 2: New York State supports sustainability plan for county buildings in Erie County

RGGI funds are enabling Erie County to develop a Climate Action and Sustainability Plan for internal county operations. The plan is expected to save more than $700,000 in energy costs and reduce harmful greenhouse gas emissions by approximately 5,300 metric tons of carbon dioxide by 2020, the equivalent to taking 925 cars off the road. The funds will be used to support the training of a Green Team and to develop the county sustainability plan.

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 will be posted to NYSERDA's website in the fourth quarter of 2016.

Governor Cuomo announced the Cleaner, Greener Communities (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 the State's ongoing investments in infrastructure aid in moving communities and NYS 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:

- All CGC Round 1 awarded projects have been executed for a total of 45 contracts, which include comprehensive planning activities and large-scale sustainability projects.
- NYSERDA executed no additional contracts for CGC Round 2 awarded projects for a total of 40 executed contracts, which include comprehensive planning activities and large-scale sustainability projects. Five contracts are still under negotiation.
- NYSERDA received 12 new applications for incentives to 12 municipalities for adoption of streamlined permitting processes for solar electric systems or electric vehicle supply equipment (EVSE).
- NYSERDA is negotiating contracts for the third round of funding ($25 million) for Phase II of the CGC program, which includes 17 projects. No contracts have been executed yet.

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.

Key accomplishments as of this quarter:

- A total of 15 projects received awards from program inception through September 30, 2016.
- A total of 11 projects are in progress.
- Four projects are complete.

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 m

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:

- Proposals for the Energy to Lead Competition were due April 4, 2016. NYSERDA received 40 proposals from 33 institutions
- The $1 million award winners were announced May 16, 2016. The winning institutions are Bard College, University at Buffalo, and Broome Community College

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 2015 Annual Report, issued in September 2015, presents financial data for the approved GJGNY programs through June 30, 2015.

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 U.S. Department of Energy Better Buildings grant in the amount of $40 million, of which $18.6 million supports GJGNY financing or outreach. On occasion, NYSERDA also supplemented the GJGNY program funding with additional RGGI funds 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 a combination of short-term financing and proceeds from the sale of bonds. More details regarding the bond issuance process are in the Annual Report.

Even though NYSERDA has success using bonds to support the residential revolving loan fund, because of the subsidized interest rate offered on a rapidly growing number of GJGNY loans and the inability to include higher-risk loans in the portfolio of loans pledged for securities, the residential loan fund could not continue operating as it had previously. Reduced RGGI auction proceeds and the need to balance GJGNY program needs with other initiatives to achieve the State's goals for reduced GHG emissions limit NYSERDA's ability to fully mitigate loan fund losses, which have increased dramatically. The need to address the unsustainability of the residential loan fund became critical in 2015. Working with the Advisory Council, a plan was developed to implement higher interest rates for consumers with sufficient household incomes and meet traditional market-based underwriting criteria. The need for funding to support overcollateralization is by far the greatest for this sector, particularly for those obtaining loans for solar PV projects. The interest rates offered to these customers will reflect the actual cost of administering the loans, while continuing to offer discounted rates to consumers lacking access to alternative financing options. The interest rate changes, which were implemented on September 1, 2016, along with the occasional addition of a limited amount of RGGI funds are expected to adequately maintain the residential loan fund.

Funding allocated to individual components of GJGNY is nearly fully committed or expended. In the interest of maintaining initiatives that are successful, NYSERDA included elements of GJGNY in the planning of the CEF.[6] 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.

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[6] The Clean Energy Fund (CEF), one of Reforming the Energy Vision's (REV) three strategic pillars, is designed to deliver on the State's commitment to reduce ratepayer collections, drive economic development, and accelerate the use of clean energy and energy innovation. It will reshape the State's energy efficiency, clean energy, and energy innovation programs. Visit http://www.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 Building Performance Institute (BPI) GoldStar contractors conduct comprehensive home energy assessments and upgrades. Free and reduced-cost home energy assessments are available to homeowners in NYS through GJGNY funding, which drives increased participation in this program and cuts additional GHG emissions.

Effective for new applications submitted as of March 1, 2016, GJGNY funded audits in territories not covered by the Clean Energy Fund, specifically in PSEG Long Island and municipal electric territories. NYSERDA's Single Family Residential programs are using Clean Energy Funds for energy assessments in participating electric utility territories and are reported separately.

Key accomplishments as of this quarter:

- A total of 4,010 assessments were completed this quarter, bringing the total to 96,633 residential GJGNY assessments completed; 89,688 (93 percent) were provided at no cost to the customer.
- Of the program cumulative 29,003 completed residential units served through HPwES resulting from a GJGNY assessment and/or GJGNY financing, 9,907 (34 percent) units are associated with income-qualified Assisted HPwES customers.
- Constituency-based organizations assisted with the completion of 2,249 units, or eight percent of all completed GJGNY residential retrofits.

Multifamily Performance Program Assessments

Through GJGNY, the Multifamily Performance Program provides financing and co-funding for comprehensive energy assessments and the development of an Energy Reduction Plan (ERP), serving market-rate and low- to moderate-income residential buildings with five or more units to increase adoption of clean energy in 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 percent energy reduction threshold. Additional performance payments apply to eligible projects that predict and achieve savings of more than 20 percent.

Key accomplishments as of this quarter:

- A total of 324 assessments were completed through September 30, 2016; of these, 56 percent are associated with affordable housing.
- Of the program cumulative 37,587 residential units served with installed measures, 20,933 (56 percent) units are associated with affordable housing.

Small Commercial Energy Efficiency Program Assessments

The GJGNY Small Commercial Energy Efficiency Program offers energy assessments and technical assistance to help small businesses and not-for-profit organizations improve their energy efficiency and reduce their energy costs to support the goal of increasing clean energy project adoption statewide. The program offers free energy assessments, along with technical assistance, to help identify economically viable improvements that may yield substantial annual energy savings. GJGNY offers 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 competitively selected by NYSERDA provide assessments and technical assistance.

Key accomplishments as of this quarter:

- A total 118 new energy assessments were completed during this quarter, bringing the total number of completed assessment to 3,175.
- The 2015 Small Commercial Energy Efficiency Program Impact Evaluation reported 44 percent of the energy savings recommended through program audits were implemented, resulting in an estimated total of 1,771 completed projects through September 30, 2016.

4.5.2 Financing

One- to Four-Family Residential Buildings Program Financing

GJGNY financing is available to participants in HPwES to finance the installation of recommended energy efficiency improvements with the possibility of reimbursement through energy savings. Net-metered technologies, including solar electric systems, and solar thermal systems are also eligible for GJGNY financing. The Smart Energy Loan and the innovative On-Bill Recovery (OBR) Loan are the two low-interest rate financing options available through GJGNY, which enable more projects resulting in greater reductions of GHG emissions.

Key accomplishments as of this quarter:

- A total of 17,092 loans have been issued totaling $204.3 million.
- Assisted HPwES customers make up 31.7 percent of the Home Performance loans issued, representing 23.8 percent of the total loan funds.
- Through September 30, 2016, a total of 5,987 OBR Loans have closed, valued at approximately $82.8 million.
- Through September 30, 2016, of the total 17,092 loans closed, 5,017 are solar electric loans valued at $85.4 million.

Multifamily Performance Program Financing

Launched in 2011, financing through the Multifamily Performance Program under GJGNY includes programs and incentives for owners, facility managers, developers, and condo/co-op boards of multifamily buildings with five or more units 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 percent of the loan (up to a maximum of $5,000 per unit or $500,000 per building) at two percent interest, and the lender setting the interest rate on its share of the loan.

Key accomplishments as of this quarter:

- Through September 31, 2016, 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 percent of the loan principal, up to $50,000, at two percent interest and the participating lender provides the remaining loan principal at its market interest rate. In June 2012, NYSERDA launched the OBR Loan for small business and not-for-profit customers, making a NYSERDA loan available for up to $50,000 at 2.5 percent interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill. Fourteen lenders have agreed to offer either Participation Loans or OBR loans.

Key accomplishments as of this quarter:

- A total of 25 OBR Loans have been closed with a total value of $738,871, which represents 90 per cent of the total financing value of $818,377.
- A total of 27 Participation Loans have closed with a value of $1,844,416. NYSERDA's share of the total value is $868,998.

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 (DOL) 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. An open enrollment solicitation providing Building Performance Institute (BPI) exam fee reimbursement to individuals statewide, closed on February 29, 2016. Limited exam fee reimbursements will remain available to Home Performance Contractors through the Single Family Residential program, but will not be available to the general public as they were in previous years.

Key accomplishments as of this quarter:

- Through September 2016, NYSERDA's GJGNY training partners trained over 3,820 individuals in courses including: solar thermal installation, introductory solar electric training, advanced air sealing, pressure diagnostics, BPI Basic Air Sealing and Insulation, oil-heat technology, and thermography. Training partnerships include public and private educators, professional associations, and not-for-profits.

The vast majority of NYSERDA's GJGNY-funded training partnership agreements concluded by June 31, 2016 with just one training contract, SUNY Ulster, still open through December 2016. During the 2015–2016 academic year, SUNY Ulster trained 225 individuals in clean energy courses, which include BPI Building Analyst, Envelope Professional, and Heating Professional as well as several BPI continuing education unit-approved courses including Duct Testing and Confined Space for Contractors. Trainees included those new to the field as well as established professionals in the field needing updated credentials. SUNY CETT is a BPI-recognized provider of the BPI Written and Field Exams and hosts a Test House at SUNY Ulster in Stone Ridge for those needing field recertification. In the renewable energy arena, SUNY Ulster delivered training in Photovoltaic Systems, NABCEP Entry Level Certificate Assessment Preparation, NABCEP Entry Level Certificate Assessment, Advanced PV Off-Grid, Electrical Theory I, and Electrical Distribution.

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.

Key accomplishments as of this quarter:

- Affordable Housing Partnership continues to gather leads through their Homeownership informational website.
- Adirondack North Country Association (ANCA) continued its work on the Akwesane housing efficiency retrofit project which among other things seeks to retrofit 50 townhomes with the help of NYSERDA programs and a HUD grant; and has begun to plan outreach in the Watertown area via the Watertown City Council. ANCA also set up a booth at Senator Patti Ritchie's Health and Wellness Fair in Canton, where a number of homeowners filled out HPwES applications. ANCA met with sustainability officers at various North Country colleges to plan outreach to college employees to obtain energy assessments.
- El Puente participated in the NYC HPD/Brownsville Neighborhood planning process meeting to Inform attendees about energy efficiency programs. They operated an information table at the Community Retrofit NYC event to connect with building owners. El Puente continued engaging with Community Boards via a presentation at Community Board 7, explaining program information and inviting attendees to participate
- Long Island Progressive Coalition tabled at the Farmingdale, Wyandanch and Bellport community fairs and 15th Annual Alive after Five, in addition to working with the Brentwood Public Library's Critical Conversations Community Forum to present efficiency information. They also gave a presentation with program information at the Nostrand Civic Association on Long Island and tabled at the Uniondale Annual Cookout and the 55th Annual Greek Festival.
- Neighborhood Housing Services (NHS) of Jamaica tabled at a Landlord's Resource Fair event hosted by Council Member Daneek Miller. NHS with their subcontractor, Chayya performed outreach at Chayya's annual South Asian Street Fair, which is a full day event for approximately 1000 attendees.
- Neighborhood Housing Services (NHS) of Staten Island took part in the Be Active community center event and presented to the Integrated Senior Services board on Staten Island. They worked with Grid Alternatives, (a not for profit that installs solar on the homes of low income people relatively free) to reach out to the clients that have already had solar installations, to explore further retrofit measures. NHS Staten Island participated in the Green & Healthy Home Initiative meeting, which integrates weatherization with health related home issues such as lead remediation.
- PathStone continued to table at the South Wedge, Churchill and Lakeside weekly Farmers Markets. In addition, Pathstone tabled at the Charlotte Neighborhood Resource Fair continued to table at the weekly Farmers Markets. They participated in the Rochester Betterment in the Community event, which focused on health awareness. Pathstone also participated in the Seniors Rock Little Theater event in the Rochester area; an outing that provides information and exhibit tables to seniors along with snacks, giveaways and a film.
- Public Policy and Education Fund (PPEF) Southern Tier was a guest of the WNBF radio station talk show, where they discussed energy efficiency and how to access programs. PPEF performed outreach during the Tioga Senior Health Fair, an annual event which draws seniors interested in maintaining independent living. They also performed outreach during the Twin Tiers Remodel Expo in Chemung County, which draws up to 5,000 residents to view exhibits and hear educational presentations as a one-stop source for remodeling information.

- People United for Sustainable Housing (PUSH) Buffalo participated in the Erie County Quarterly Employee Meeting, which allowed them to disseminate program information. PUSH met with City of Buffalo Council Member Rasheed Wyatt to discuss outreach in Buffalo's University District, and plan an October or November outreach event. They also met with Niagara University Professor, David Reilly, to discuss outreach opportunities with members of the Black Student Union at Niagara University. A follow up conversation will take place. PUSH Buffalo met with the Catholic Diocese of Western New York to discuss ways to connect parishioners with energy efficiency program information. In addition, PUSH met with Common Councilmember David Rivera to provide program information for his newsletter.
- Rural Ulster Preservation Company (RUPCO) completed its first joint audit-retrofit/solar install with Ulster Youth Build and Grid Alternatives in Yonkers, and promoted the event through social media and video. RUPCO hosted a Get Set Kingston Workshop, a workshop promoted by the Mayor's office in addition to RUPCO's canvassing and social media, during which three homeowners participated by applying for home energy assessments. RUPCO tabled at the La Guelaguetza 2016 Festival in Poughkeepsie, an event organized by the Grupo Folclorico de Poughkeepsie, a group whose mission is to celebrate Mexican culture. The event drew approximately 700 people. RUPCO continued to promote its events through social media.
- Sustainable South Bronx (SSBx) tabled at the St. Theresa Feast in the Bronx and at the Jacobi Medical Center employee area. SSBx continued its homeowner direct-visit outreach within the Shorehaven condo development and assisted applicants with navigating financing questions. SSBx staff also attended a Bronx Business Opportunity Expo and networked with different organizations that do work in the Bronx. They were able to connect with a Con Ed representative to discuss cross promotion at Con Ed events, with a follow up planned for next month. SSBx tabled at three events with the Morris Heights Health Center and was able to generate leads in the community.

4.6 NY 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 NYS 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 as of this quarter:

- Executed and closed two transactions totaling $77.5 million contributing to NY Green Bank's total portfolio of $198.5 million across various technologies and financing arrangements.
- Continued to grow NY Green Bank revenues.
- Through ongoing business development activities, achieved an active pipeline of potential investments progressing towards close at the end of the quarter of $638.7 million.
- Submitted Compliance filing on August 5, 2016 to the PSC confirming that NY Green Bank had committed $150.0 million to fully negotiated, signed and closed agreements pursuant to the "Order Approving Additional Capitalization with Modification for New York Green Bank" issued and effective July 17, 2015. Following this filing, NY Green Bank received $150 million representing additional allocated capital.
- Held NY Green Bank Advisory Committee meeting on July 26, 2016.
- Filed quarterly Metrics Report with the PSC on August 15, 2016.

4.7 Program Evaluation

Several RGGI evaluation studies are underway or in the planning stages as of the third quarter of 2016. 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**[7] help identify whether a program has various factors in place that will ensure an evaluation is justified, feasible, and likely to provide useful information.

[7] Formerly known as Evaluability Assessment.

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

Home Performance with ENERGY STAR Program: An Impact Evaluation of the Green Jobs - Green New York "assessment only" participants is nearing completion. This evaluation seeks to identify those who may have received a GJGNY-funded audit and installed measures on their own in the absence of incentives. NYSERDA is also undertaking an Impact Evaluation to measure and verify effects attributable to RGGI fuel incentives. These studies will leverage major, in-progress evaluation of the SBC/EEPS-funded HPwES program. The completion date for the Impact Evaluation work is planned for the fourth quarter of 2016. A Process/Market Evaluation of the SBC/EEPS-funded HPwES is also being used to assess the RGGI fuel efficiency incentive activity and GJGNY assessment/loan activity. The Process/Market Evaluation study was completed in Q4 2015 and is available on NYSERDA's website.[8]

Also underway is an impact evaluation of HPwES unregulated fuels[9] projects. 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. The anticipated completion date for this evaluation is in the fourth quarter of 2016.

Residential Non-Energy Impact Study: A study was conducted to identify and begin to quantify measurable non-energy effects from residential programs, including possibly HPwES and the Green Residential Building Program. This study was jointly supported with RGGI and other NYSERDA funds. The finalized study report is expected in 2016 and will help inform future non-energy impact analysis and reporting for RGGI programs.

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

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

Green Jobs - Green New York Jobs Quantification Study: An update to the 2013 study on this topic is currently underway. This study will quantify direct, indirect, and induced jobs created/retained from the GJGNY program, including those in disadvantaged communities. The study examines changes in worker skill level and wages resulting from GJGNY. The completed study is expected in the fourth quarter of 2016.

Wastewater Energy Efficiency Program: An impact evaluation of the Wastewater Efficiency Program is currently underway with an expected completion date in the fourth quarter of 2016. 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 will confirm the study-recommended savings that customers adopted.

4.7.2 Evaluation of Technology/Business Development and Research Programs

Advanced Transportation Research: A Logic Model for this program was completed in Q3 2015 and published on the NYSERDA website.[10] A Market Characterization of the transportation market in NYS and several Impact/Market Impact case studies for a select group of program-supported technologies were initiated in the first quarter of 2016. One case study is final and is published on the NYSERDA website with the expected completion of the other case studies in Q4 2016.[11]

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

Clean Energy Business Development (CEBD): A market characterization is underway with data collection for the various survey, continuing interview efforts, and preliminary analyses conducted on the initial data collected.

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

11 https://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/2016-Transportation-Case-Study-Buffalo-Niagara-Medical-Campus.pdf

Community Solar NY: A Logic Model report for this program was finalized in Q3 2015 and published on the NYSERDA website.[12] Work began on the Solar Balance of System Baseline Cost Study in the first quarter of 2016.

Power Systems Program: An Impact Evaluation is underway for the Power Systems Program with an expected completion date in the fourth quarter of 2016.

4.7.3 Baseline Studies

NYSERDA is also conducting two major baseline studies to assess residential and commercial markets across a broad range of customer segments and energy measures. The goals of these studies are: 1) to better understand building stock and associated energy use, including saturations of energy-consuming measures, penetrations of energy-efficient equipment, building characteristics and energy management practices; and 2) use this information to estimate the technical, economic and achievable energy efficiency opportunities in NYS 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.[13] The Commercial Baseline study is underway with an anticipated completion date of 2017.

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12. Community Solar NY Program: Final Initiative-Level Logic Model Report, nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Community-Solar-NY-Final-Initiative-Level-Logic-Model-Report.pdf

13 Residential Statewide Baseline Study of New York State, nyserda.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 CO_2 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,[14] emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO_2e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,[15] 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_2O)	310

[14] 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.

[15] 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 U.S. Environmental Protection Agency (EPA) emission coefficients. The CO_2e values represent aggregate CO_2, CH_4, and N_2O emissions. If a program covers more than one sector, then the estimated reduction is based on a calculated average emission factor for the affected sectors.

Table A-2. Fuel Combustion Emission Factors by Sector

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

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

A marginal emission factor of 1,160 pounds of CO_2e/MWh estimates emission reductions associated with electricity use reductions for all sectors.[16] Although electricity savings may not lead to near-term emission reductions under the RGGI CO_2 cap, savings will potentially reduce imports of electricity to NYS; the demand for CO_2 allowances, leading to a possible future reduction in the cap; and the carbon-footprint of end-users, as they will be responsible for a smaller percent of the emissions associated with electricity production.

16 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 CO_2e/MWh to 1,160 pounds CO_2e/MWh. The emissions reductions calculated for this report reflect the new factor of 1,160 pounds CO_2e/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	25.59	34.21
Commercial	0.16	5.09	24.51	26.04
Industrial	0.12	5.09	23.39	30.32
Transportation	0.05	N/A	27.58	N/A
C&I	0.14	5.09	23.95	28.18

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

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

Table A-4. Program Measure Life Assumptions

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

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

Appendix B: Former Program Names

Table B-1. Former Program Names

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

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_2e 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[17]	198,807	502,987	144,247,847

[17] 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	
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	-	

Quarter End Date	Quarter	Fuel Type	Cumulative Annual (MMBtu)	Cumulative Annualized Pipeline (MMBtu)[a]
12/31/2011	Qrt 4	Kerosene	285	
12/31/2011	Qrt 4	Natural Gas	88,439	
12/31/2011	Qrt 4	Oil	150,163	
12/31/2011	Qrt 4	Propane	7,344	
12/31/2011	Qrt 4	Steam	10,157	
12/31/2011	Qrt 4	Wood	592	
3/31/2012	Qrt 1	Diesel	-	
3/31/2012	Qrt 1	Gasoline	-	
3/31/2012	Qrt 1	Kerosene	285	
3/31/2012	Qrt 1	Natural Gas	108635	
3/31/2012	Qrt 1	Oil	186,637	
3/31/2012	Qrt 1	Propane	11,810	
3/31/2012	Qrt 1	Steam	10,157	
3/31/2012	Qrt 1	Wood	749	
6/30/2012	Qrt 2	Diesel	-	
6/30/2012	Qrt 2	Gasoline	-	
6/30/2012	Qrt 2	Kerosene	285	
6/30/2012	Qrt 2	Natural Gas	140,597	
6/30/2012	Qrt 2	Oil	246,477	
6/30/2012	Qrt 2	Propane	12,798	
6/30/2012	Qrt 2	Steam	10,157	
6/30/2012	Qrt 2	Wood	1,000	
6/30/2012	Qrt 2	Residual Oil	144	
9/30/2012	Qrt 3	Diesel	-	
9/30/2012	Qrt 3	Gasoline	-	
9/30/2012	Qrt 3	Kerosene	285	
9/30/2012	Qrt 3	Natural Gas	183,379	
9/30/2012	Qrt 3	Oil	303,649	
9/30/2012	Qrt 3	Propane	14,187	
9/30/2012	Qrt 3	Residual Oil	144	
9/30/2012	Qrt 3	Steam	15,901	
9/30/2012	Qrt 3	Wood	1,599	
12/31/2012	Qrt 4	Diesel	-	
12/31/2012	Qrt 4	Gasoline	-	
12/31/2012	Qrt 4	Kerosene	1,026	
12/31/2012	Qrt 4	Natural Gas	203,118	
12/31/2012	Qrt 4	Oil	337,096	
12/31/2012	Qrt 4	Propane	16,593	
12/31/2012	Qrt 4	Residual Oil	144	
12/31/2012	Qrt 4	Steam	15,969	
12/31/2012	Qrt 4	Wood	3,079	
3/31/2013	Qrt 1	Diesel	-	-

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

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

Quarter End Date	Quarter	Fuel Type	Cumulative Annual (MMBtu)	Cumulative Annualized Pipeline (MMBtu)[a]
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	-	-
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	Wood	23,371	21,323
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

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

[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
3/11/2015	Third	$5.41	5,906,447	$31,953,878

Table D-1 continued

Auction Date	Control Period	Clearing Price	New York State Allowances Sold	New York State Auction Proceeds
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
First Control Period Total			**144,305,904**	**$336,282,535**
Second Control Period Total			**128,764,643**	**$391,950,232**
Third Control Period Total			**44,594,375**	**$249,238,169**
TOTAL			**317,664,922**	**$977,470,936**

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
3/31/2014	Qrt 1	Interest Allocated to the RGGI Portfolio	$4,400,174

Table E-1 continued

Quarter End Date	Quarter	Fund Category	Cumulative Funds ($)
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
9/30/2016	Qrt 3	RGGI Auction Proceeds	$977,470,936

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 percent of the program activity.

Key accomplishments:

- 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.
- Projected annual savings are 46,546 MWh and 56,447 MMBtu, after all project installations are complete.
- Communities have reported installing systems resulting in annual savings of 34,942 MWh and 50,098 MMBtu to date.

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 percent and 23 percent 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 30th, 2016. NYSERDA is in final stages of rolling out a new Clean Energy Communities Program, which will build upon the successes of the EDGE Program. The Clean Energy Community Program will provide 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.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.[18]

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

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.[19]

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.[20]

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.[21]

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.[22]

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

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

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

22 RGGI Multifamily Carbon Emissions Reduction Program Impact Evaluation (2011–2012); http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/MCERP_IMPT_RP_FINAL.pdf.

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 percent of the recommended energy savings were implemented. The final report is available NYSERDA's website.[23]

F.2.7. Cleaner Greener Communities (CGC) Program

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. NYSERDA's will post the process evaluation encompassing the two research waves on their website in the fourth quarter of 2016.

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.[24]

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[23] GJGNY Small Commercial Energy Efficiency Program, http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2015ContractorReports/2015-Small-Comm-Impact-Evaluation-July-2010-December-2013.pdf.

[24] GJGNY Constituency-Based Organization (CBO) Program, http://www.nyserda.ny.gov/-/media/Files/Publications/PPSER/Program-Evaluation/2016ContractorReports/GJGNY-CBO-Outreach-Program-Process-Evaluation.pdf

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EEA-RGGI-2016-Q3-r-1-v1
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