

New York State Energy Research and Development Authority

New York's RGGI-Funded Programs Status Report

Quarter Ending June 30, 2013

November 2013



NYSERDA's Promise to New Yorkers:

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

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

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

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

Our Portfolios

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

Energy Efficiency and Renewable Energy Deployment

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

Energy Technology Innovation and Business Development

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

Energy Education and Workforce Development

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

Energy and the Environment

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

Energy Data, Planning and Policy

Helping to ensure that New York State policymakers and consumers have objective and reliable information to make informed energy decisions – including State Energy Planning, policy analysis to support the Regional Greenhouse Gas Initiative and other energy initiatives, emergency preparedness, and a range of energy data reporting.

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1 Introduction

To implement the Regional Greenhouse Gas Initiative (RGGI), New York State (NYS) established its Carbon Dioxide (CO₂) Budget Trading Program through regulations promulgated by the Department of Environmental Conservation (DEC) and the CO₂ Allowance Auction Program through regulations promulgated by the New York State Energy Research and Development Authority (NYSERDA).¹ This report is prepared pursuant to the New York's Regional Greenhouse Gas Initiative Investment Plan (2013 Operating Plan)² and provides an update on the progress of programs through the quarter ending June 30, 2013. 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 2013 version of the Operating Plan was approved by NYSEDA's Board of Directors on June 17, 2013.³

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

¹ For the DEC adopted regulations, see 6 NYCRR Part 242: CO₂ Allowance Auction Program Regulations.

² On June 21, 2010, NYSEDA Part 242: CO₂ Budget Trading Program Regulations; for the NYSEDA adopted regulations, see 21 NYCRR Part 507 published an Operating Plan that provides the budgets and descriptions for the programs that would be funded by the RGGI auction proceeds. Please refer to RGGI Use of Auction Proceeds (http://www.nyserda.ny.gov/BusinessAreas/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx?sc_database=web) for ongoing developments.

³ Please refer to the 2013 RGGI Operating Plan Amendment (<http://www.nyserda.ny.gov/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx>) for details.

1.1 New York's RGGI Funds⁴

As of June 30, 2013, New York State sold more than 212.5 million CO₂ allowances and received nearly \$498.7 million in auction proceeds. In addition, nearly \$3.0 million in interest earnings were allocated on the RGGI portfolio and nearly \$0.8 million in interest earnings were allocated on the Green Jobs – Green New York (GJGNY) program. These funds are reinvested for program implementation and are allocated to various RGGI programs. Detailed auction results are presented in Table 1-1, and total RGGI funds are shown in Table 1-2.

Table 1-1. New York State's RGGI Auction Results⁵

Source: RGGI, Inc.

Auction Date	Control Period	Clearing Price	New York State Allowances Sold	New York State Auction
12/17/08	First	\$3.38	12,422,161	\$41,986,904
3/18/09	First	\$3.51	12,422,161	\$43,601,785
	Second	\$3.05	776,385	\$2,367,974
6/17/09	First	\$3.23	11,861,849	\$38,313,772
	Second	\$2.06	776,385	\$1,599,353
9/09/09	First	\$2.19	11,861,849	\$25,977,449
	Second	\$1.87	776,385	\$1,451,840
12/02/09	First	\$2.05	11,861,850	\$24,316,793
	Second	\$1.86	571,423	\$1,062,847
3/10/10	First	\$2.07	15,136,022	\$31,331,566
	Second	\$1.86	740,167	\$1,376,711
6/9/10	First	\$1.88	15,136,022	\$28,455,721
	Second	\$1.86	756,801	\$1,407,650
9/8/10	First	\$1.86	11,421,736	\$21,244,429
	Second	\$1.86	464,418	\$863,817
12/1/10	First	\$1.86	8,678,724	\$16,142,427
	Second	\$1.86	414,863	\$771,645
3/9/11	First	\$1.89	15,153,524	\$28,640,160
	Second	\$1.89	757,676	\$1,432,008
6/8/11	First	\$1.89	4,519,648	\$8,542,135
	Second	\$1.89	383,114	\$724,085
9/7/11	First	\$1.89	2,689,151	\$5,082,495
	Second	n/a	-	-
12/7/11	First	\$1.89	9,621,954	\$18,185,493
	Second	n/a	-	-

⁴ RGGI funds include both auction proceeds and interest earned from those proceeds. See NY Proceeds by Auction(http://www.nyscrda.ny.gov/BusinessAreas/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx?sc_database=web) for more details on auction results.

⁵ New York did not offer allowances for sale in the RGGI auction held on December 25, 2008, where the clearing price for 2009 vintage allowances was \$3.07. The first control period for fossil-fuel fired electric generators took effect on January 1, 2009 and concluded on December 31, 2011. The second control period took effect on January 1, 2012 and extends through December 31, 2014.

Table 1-1 continued

3/14/12	Second	\$1.93	8,895,733	\$17,168,765
6/6/12	Second	\$1.93	8,265,426	\$15,952,272
9/5/12	Second	\$1.93	9,315,659	\$17,979,222
12/5/12	Second	\$1.93	7,568,550	\$14,607,302
3/13/13	Second	\$2.80	14,252,818	\$39,907,890
6/5/13	First	\$3.21	750,000	\$2,407,500
	Second	\$3.20	14,252,818	\$45,751,546
First Control Period Total			143,536,651	\$334,228,629
Second Control Period Total			68,968,621	\$164,424,927
TOTAL			212,505,272	\$ 498,653,556

Table 1-2. New York State's RGGI Funds through June 30, 2013

Fund Category	Cumulative Funds
RGGI Auction Proceeds	\$498,653,556
Interest Allocated to the RGGI Portfolio	\$3,026,525
Interest Allocated to the GJGNY Program	\$770,000
TOTAL	\$502,450,081

2 Budget and Spending Status

This section presents financial data for the approved RGGI programs through June 30, 2013. Table 2-1 reflects how the nearly \$502.5 million of current funds are allocated across the four major program areas:

- Residential/Commercial/Industrial/Municipal.
- Transportation.
- Power Supply and Delivery.
- Multi-Sector.

Table 2-1 also presents the current contract commitments and spending levels for each program.

Table 2-1. Available Funding and Financial Status through June 30, 2013 (millions of dollars)

Source: NYSERDA

	Budgeted Funds ^a	Expended Funds ^b	Open Encumbrances ^c	Pre-Encumbrances ^d	Committed Funds ^e
Residential/Commercial/Industrial/Municipal					
Residential Efficiency Services	40.1	20.4	10.2	4.6	35.2
Municipal Water and Wastewater	1.9	1.2	0.5	-	1.7
Advanced Buildings	2.1	0.8	0.2	-	1.1
Industrial Innovations	10.2	1.0	2.4	5.0	8.4
Total Residential/Commercial/Industrial/Municipal	54.3	23.4	13.3	9.6	46.4
Transportation					
Transportation Research	2.0	1.2	0.8	-	2.0
Total Transportation	2.0	1.2	0.8	-	2.0
Power Supply and Delivery					
Statewide Photovoltaic Initiative	40.4	11.3	0.1	-	11.3
Advanced Power Technology	3.9	3.6	0.3	-	3.8
Competitive Greenhouse Gas Reduction Pilot	14.5	-	-	-	-
Total Electric Power Supply and Delivery	58.8	14.8	0.3	-	15.1
Multi-Sector					
Climate Research and Analysis	7.8	2.4	2.4	1.6	6.3
Clean Energy Business Development	21.0	4.8	5.6	2.3	12.6
Regional Economic Development and Greenhouse Gas Reductions	12.4	-	3.9	8.4	12.4
Cleaner, Greener Communities	62.4	10.5	5.6	35.8	51.9
Total Multi-Sector	103.6	17.7	17.5	48.0	83.2
Other Costs^f					
Deficit Reduction Plan (DRP) Transfer ^g	90.0	90.0	-	-	90.0
Con Edison Smart Grid Program ^h	13.2	13.2	-	-	13.2
Program Administration ⁱ	20.8	8.9	-	-	8.9
Metrics and Evaluation	12.7	0.4	1.7	1.1	3.2
RGGI Inc. Costs ^j	5.2	4.2	0.8	-	5.0
New York State Cost Recovery Fee	4.7	2.0	-	-	2.0
OTHER COSTS TOTAL	146.7	118.8	2.5	1.1	122.4
SUBTOTAL	365.4	175.9	34.5	58.8	269.1
Green Jobs - Green New York					
Green Jobs - Green New York	112.8	67.3	11.7	18.5	97.4
New York Green Bank					
New York Green Bank	24.3	-	-	-	-
TOTAL^k	502.5	243.2	46.1	77.2	366.6

^a Includes auction proceeds and allocated interest on the RGGI and GJGNY portfolios. The allocation is consistent with the three-year budget presented in the Operating Plan.

^b Invoices processed for payment by NYSERDA.

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

^d Planned funding for contracts awarded and under negotiation; and planned funding under active development through open solicitations with upcoming proposal due dates.

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

^f The values for Program Administration, Metrics and Evaluation, and the New York State Cost Recovery Fee represent aggregate funds and commitments for RGGI-funded activities, NOT including GJGNY. For information on GJGNY finances, please refer to Table 4.1.

^g On December 4, 2009, New York State enacted numerous deficit reduction measures that included the transfer of \$90 million in RGGI auction proceeds to the General Fund.

^h 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. As of June 30, 2013, the parties to the consent decree estimate that the total commensurate benefit for the years 2009-2014 is \$13.2 million and agreed to dedicate such funds for the development of smart grid technologies in the Con Edison territory. 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 \$15.5 million to reflect these additional estimated costs that were required to be recorded.

ⁱ Includes NYSERDA's upfront administrative expenses related to the development and implementation of the CO₂ Budget Trading Program, the CO₂ Allowance Auction program, and the Operating Plan.

^j The first-year budget includes RGGI Inc. start-up costs and New York State's share of ongoing RGGI Inc. expenses. RGGI Inc. is a non-profit corporation created to support development and implementation of the CO₂ Budget Trading Program.

^k Totals may not sum exactly due to rounding.

3 Summary of Portfolio and Program Benefits

Table 3-1 and Table 3-2 show the estimated cumulative annual benefits as of June 30, 2013 at the portfolio and program levels, respectively.⁶ These metrics are estimates made by program implementation staff and have not been evaluated. When evaluation results are available, they will be presented in subsequent Annual Evaluation and Status Reports, which also will include these metrics along with macroeconomic indicators such as job creation resulting from program activity. NYSERDA begins tracking program benefits once projects have been installed. The reporting of fund transfers may lag behind the installation date such that program benefits are reported prior to the financial reporting of funds spent. At this time, the program benefits include some projects that are also supported by other non-RGGI funding sources administered by NYSERDA.

Table 3-1. Summary of Expected Cumulative Portfolio Benefits through June 30, 2013

Source: NYSERDA

Benefits through June 30, 2013	Installed Savings^a	Pipeline Savings^b	Total Savings^c
Net Greenhouse Gas Emission Savings ^d (Annual Tons CO ₂ e ^e)	69,068	48,819	117,887
Net Electricity Savings (Annual MWh)	20,038	14,849	34,887
Renewable Energy Generation (Annual MWh)	4,386	-	4,386
Net Natural Gas Savings (Annual MMBtu)	313,287	76,148	389,435
Net Fuel Oil Savings (Annual MMBtu)	411,518	262,809	674,327
Net Propane Savings (Annual MMBtu)	21,051	7,341	28,392
Net Steam Savings (Annual MMBtu)	15,969	30,232	46,201
Net Wood Savings (Annual MMBtu)	6,550	935	7,485
Net Kerosene Savings (Annual MMBtu)	1,270	138	1,408
Net Gasoline Savings (Annual MMBtu)	-	-	-
Net Residual Oil Savings (Annual MMBtu)	144	20	164
Net Diesel Savings (Annual MMBtu)	-	-	-
Net Coal Savings (Annual MMBtu)	397	-	397
Total Fuel Savings (Annual MMBtu) ^f	770,186	377,624	1,147,810
Annualized Energy Bill Savings to Participating Customers (\$ Million) ^g	18.1	10.3	28.5

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

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

^c The sum of Installed Savings and Pipeline Savings.

^d 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. Nevertheless, electric efficiency projects will reduce end-users' responsibility or footprint associated with emissions from electricity production.

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

^f This total excludes fuel savings and new fuel usage associated with the Multifamily Carbon Emission Reduction Program. The Multifamily Carbon Emissions Reduction Program is a fuel-switching program and does not claim any energy or bill savings.

^g This total excludes bill savings associated with steam for the Multifamily Performance Program, and bill savings associated with the Multifamily Carbon Emission Reduction Program. The Multifamily Carbon Emissions Reduction Program is a fuel-switching program and does not claim any energy or bill savings.

⁶ Cumulative annual benefits are reflective of the annual impacts from all currently operational projects installed since program inception.

Table 3-2. Summary of Expected Cumulative Program Benefits through June 30, 2013

Source: NYSERDA

Program	Net Energy Savings (Annual MMBtu)			Net Electricity Savings or Renewable Energy Generation (Annual MWh)			Net Greenhouse Gas Emission Savings ^a (Annualized Tons CO ₂ e ^b)		
	Installed Savings ^c	Pipeline Savings ^d	Total Savings ^e	Installed Savings ^c	Pipeline Savings ^d	Total Savings ^e	Installed Savings ^c	Pipeline Savings ^d	Total Savings ^e
Residential, Commercial, Industrial & Municipal Sectors									
<i>Green Jobs - Green New York</i>									
GJGNY - Single-Family Residential Audit Component ^f	329,906	53,949	383,856	4,447	727	5,173	23,616	3,860	27,475
GJGNY - Single-Family Residential Loan Component ^f	178,613	20,952	199,565	2,686	315	3,002	12,950	1,518	14,468
GJGNY - Multifamily Residential Audit Component ^f	183,329	71,861	255,190	10,528	4,127	14,655	16,631	6,519	23,150
<i>Residential Efficiency Services</i>									
Multifamily Performance Program	187,431	239,649	427,080	3,701	4,732	8,432	16,625	21,256	37,881
Multifamily Carbon Emissions Reduction Program ^g	-	-	-	-	-	-	6,956	15,222	22,178
EmPower New York	25,992	12,700	38,692	-	-	-	2,029	992	3,021
Home Performance with ENERGY STAR [®]	82,055	12,689	94,744	484	75	559	7,163	1,109	8,272
Green Residential Building Program	16,234	21,754	37,988	782	1,907	2,689	1,293	2,092	3,385
Solar Thermal Incentive Program	2,552	556	3,108	-	-	-	183	44	228
Power Supply & Delivery									
Statewide Photovoltaic Program	-	-	-	4,386	-	4,386	1,811	-	1,811
Multi-Sector									
Regional Economic Development & GHG Reduction	-	5,812	5,812	-	3,687	3,687	-	1,912	1,912
Cross-Program Overlap ^h	235,926	62,298	298,223	2,590	720	3,310	20,189	5,706	25,895
TOTAL	770,186	377,624	1,147,810	24,424	14,849	39,273	69,068	48,819	117,887

^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 footprints associated with emissions from electricity production.

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

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

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

^e The sum of Installed Savings and Pipeline Savings.

^f The benefits for this program include some projects that have also been supported by other non-RGGI NYSERDA funding sources.

^g The Multifamily Carbon Emissions Reduction Program is a fuel-switching program and does not claim any energy or bill savings.

^h Cross-program overlap accounts for projects that received any combination of a GJGNY audit, a GJGNY loan, or a RGGI-funded incentive through the Home Performance with ENERGY STAR[®] Program.

4 Program Activities and Implementation⁷

4.1 Residential, Commercial, Industrial, and Municipal Sectors

4.1.1 Green Jobs – Green New York (GJGNY)

GJGNY is a statewide effort aimed at strengthening communities through energy efficiency. GJGNY enables New Yorkers to make homes, businesses and neighborhoods significantly more comfortable, sustainable and economically sound. NYSERDA administers Green Jobs - Green New York, which was initiated by the Green Jobs - Green New York Act of 2009. The GJGNY Annual Report was issued on September 30, 2012.⁸ Table 4-1 presents financial data for the approved GJGNY programs through June 30, 2013.

⁷ The metrics presented in this section are estimates made by program implementation staff and are not validated; evaluation results will be presented, as they are available, in the Annual Evaluation and Status Reports.

⁸ See the Green Jobs-Green New York Annual Report (nysesda.ny.gov/Publications/Program-Planning-Status-and-Evaluation-Reports/GJGNY-Reports-and-Operating-Plans.aspx) for more information.

Table 4-1. Green Jobs – Green New York Available Funding and Financial Status through June 30, 2013 (millions of dollars)

	Budgeted Funds ^a	Expended Funds ^b	Open Encumbrances ^c	Pre-Encumbrances ^d	Committed Funds ^e
Workforce Development, Outreach and Marketing					
Workforce Development	8.0	3.0	3.0	0.4	6.4
Outreach and Marketing	15.5	7.0	3.2	5.2	15.4
Total Workforce Development, Outreach and Marketing	23.5	10.0	6.3	5.6	21.8
Residential					
Energy Audit Incentive	14.6	9.5	-	1.7	11.2
Implementation Costs	1.0	0.6	0.3	-	0.9
Financing: Loans	26.7	34.3	-	4.3	38.6
Financing: Loan Repayments	-	(4.2)	-	-	(4.2)
Financing: Implementation Costs	-	2.1	0.4	0.7	3.1
Total Financing	26.7	32.1	0.4	5.0	37.5
Total Residential	42.2	42.2	0.7	6.6	49.5
Multifamily					
Energy Audits	3.8	1.5	0.9	0.2	2.7
Implementation Costs	1.6	1.4	0.0	-	1.4
Financing: Loans	7.8	1.8	0.3	-	2.1
Financing: Loan Repayments	-	(0.1)	-	-	(0.1)
Financing: Implementation Costs	0.3	0.1	0.2	-	0.3
Total Financing	8.1	1.8	0.4	-	2.2
Total Multifamily	13.5	4.7	1.3	0.2	6.3
Small Commercial					
Energy Audits	7.8	2.6	1.3	3.9	7.8
Implementation Costs	2.6	0.3	0.2	2.1	2.6
Financing: Loans	7.5	0.1	-	-	0.1
Financing: Loan Repayments	-	(0.0)	-	-	(0.0)
Financing: Implementation Costs	0.3	0.2	0.3	-	0.4
Total Financing	7.8	0.3	0.3	-	0.5
Total Small Commercial^f	18.2	3.1	1.8	6.1	10.9
SUBTOTAL	97.4	60.1	10.0	18.5	88.6
Other Costs					
Program Administration	7.8	5.1	-	0.0	5.1
Program Evaluation	5.6	1.2	1.6	-	2.8
New York State Cost Recovery Fee	1.9	0.9	-	-	0.9
OTHER COSTS TOTAL	15.3	7.3	1.6	0.0	8.9
TOTAL	112.8	67.3	11.7	18.5	97.4

- ^a Includes auction proceeds and allocated interest on the Green Jobs-Green New York (GJGNY) funds. The allocation is consistent with the three-year budget presented in the 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.
- ^e The sum of Expended, Encumbered and Pre-Encumbered funds.
- ^f Actual Pre-Encumbrances towards the Solicitation for the contracting of implementation, quality assurance and energy assessments contractors total \$7.0 million. The total Pre-Encumbrances for the Small Commercial program presented in this table reflects additional funding from sources that include new funds, transfers, and funds disencumbered from current energy assessment contracts.

4.1.1.1 Financing

Single-Family Residential. In 2010, NYSERDA received \$40 million in funding from American Recovery and Reinvestment Act of 2009 (ARRA) Better Buildings program, which leveraged \$112 million GJGNY (RGGI) funding. From this funding, NYSERDA allocated \$900,000 to the NYS utilities participating in On-Bill Recovery financing (OBR) to offset the costs associated with billing system upgrades necessary to accommodate OBR Loans. The seven utilities participating in On-Bill Recovery include: Central Hudson Gas and Electric; Consolidated Edison Company of New York, Inc.; Long Island Power Authority (LIPA); National Grid; New York State Electric & Gas Corporation (NYSEG); Orange and Rockland Utilities, Inc.; and Rochester Gas & Electric Corporation. In March 2013, NYSERDA received invoices and processed payment to Central Hudson and LIPA. Table 4-2 is a summary of NYSERDA's reimbursements to OBR-participating utilities pursuant to the Billing Services Agreements.

Table 4-2. Reimbursements to Utilities Participating in On-Bill Recovery

Utility	Funding Available	Costs Submitted	Paid	Funding Balance
Central Hudson	\$24,091	\$104,116	\$24,091	-
ConEd	\$268,026	\$261,397	\$261,397	\$6,629
LIPA	\$89,802	\$955,518	\$89,802	-
National Grid	\$400,000	\$396,172	\$396,172	\$3,828
NYSEG	\$70,557	\$68,380	\$68,380	\$2,177
O&R	\$18,040	\$11,250	\$11,250	\$6,790
RG&E	\$29,484	\$29,770	\$29,484	-
Total	\$900,000	\$1,826,603	\$880,576	\$19,424

In June 2013, NYSERDA became a partner in a loan performance data initiative initiated by the Clean Energy Finance Center (CEFC) and the Environmental Defense Fund. This national database contains loan performance and energy usage data from multiple state programs. NYSERDA will be providing loan performance and energy usage data for NYS. The data will be combined with data from other energy efficiency lending programs and will be provided to the Data Science for Social Good Summer Fellowship Program at the University of Chicago where fellows will structure and analyze the combined energy efficiency project and loan data and produce a report in August/September containing analytical findings. Additionally, NYSERDA will participate in addressing privacy issues to assist CEFC in determine how to collect loan performance data from energy efficiency retrofit programs in a meaningful way.

GJGNY financing, a vital component of the GJGNY program, continues to expand and offer additional services to participants. Through June 30, 2013, a total of 3,600 Residential loans have been closed. These loans provided \$34.4 million in funding enabling the completion of NYS GJGNY energy efficiency projects that, without financing, may never have been started. The financed installed and pipeline energy-efficiency projects are anticipated to save 3,002 MWh and 199,565 MMBtu per year.

Multifamily Residential. A pre-loan and post-loan validation process for GJGNY Multifamily financing has been established with NYSERDA's GJGNY loan servicer and is operational. Interest in GJGNY Multifamily financing continues to grow. As of June 30, 2013, Multifamily financing received nine loan packages totaling \$7,557,988. Eight loans have closed. Additionally, three projects requested pre-approval forms based upon their Energy Reduction Plans. Development of an on-bill product continues.

Small Business and Not-for-Profit. In June 2011, NYSERDA launched the Participation Loan product to small business and not-for-profit customers. Through the Participation Loan, NYSERDA provides 50 percent of the loan principal, up to \$50,000, at 0 percent interest and the participating lender provides the remaining loan principal at the market interest rate. Since the program launch, NYSERDA has held webinars and conducted in-person trainings for lenders and NYSERDA's Constituency Based Organizations (CBOs), Economic Development Growth Extension (EDGE) Program organizations, and Energy Assessment Firms. NYSERDA also presented the program to public and investor-owned utilities (IOUs), the New York Power Authority (NYPA), LIPA, the Small Business Development Center (SBDC), and Department of Public Service (DPS) staff to increase coordination between programs and to support customer implementation of energy efficiency projects.

In June 2012, NYSERDA launched On-Bill Recovery (OBR) financing for small business and not-for-profit customers. Through OBR, small business and not-for-profit customers can receive a NYSERDA loan of up to \$50,000 at 2.5 percent interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill.

Each financing application that the Small Commercial Energy Efficiency Program receives is assessed for both Participation Loan and On-Bill Recovery Loan eligibility prior to approval. As of June 30, 2013, 17 customer applications have been approved for Participation Loans and 10 have been approved for OBR financing, four Participation Loans have been closed and six lenders have agreed to offer both Participation Loans and On-Bill Recovery Loans.

The Small Commercial Energy Efficiency Program has increased outreach to lenders in order to raise lender awareness and participation in GJGNY Small Commercial Energy Efficiency Financing. Since April, NYSERDA staff have made presentations to lenders at a LIPA-sponsored conference on Long Island, the SBDC annual conference in Niagara Falls, and a CBO-sponsored meeting in Buffalo. A contractor has been hired to market the program and perform lender outreach throughout the State. Approximately two events per month will be scheduled starting in August through the end of the year.

4.1.1.2 Audits

Single-Family Residential. Through June 30, 2013, the Single Family Residential Program has received 51,000 free/reduced-cost home audit applications associated with GJGNY. Of the received audit applications, 47,875 have been approved. From those approved applications, 38,034 audits have been completed. Of the 10,371 completed units served through Home Performance with ENERGY STAR[®] resulting from a GJGNY audit and/or GJGNY financing, 7,263 units are associated with market rate customers and 3,108 units served are associated with assisted customers. The conversion rate from audit to energy retrofit remains strong at 33%. The average cycle time between audit completion and project completion is 110 days.

GJGNY audits have lead to 9,339 GJGNY Home Performance with ENERGY STAR[®] project completions through June 30, 2013. The installed and pipeline projects are anticipated to save 5,173 MWh and 383,856 MMBtu annually.

Multifamily Residential. As of June 30, 2013, the Multifamily Program has received 239 audit applications; of these, 129 were associated with affordable housing and 110 with market-rate housing. The Multifamily Program has completed 187 audits, of which 92 are associated with affordable housing and 95 with market-rate housing. There are currently 116 projects contracted to have measures installed. Of those 116 projects, 60 are associated with affordable housing and 56 are associated with market-rate housing.

Energy savings associated with installed and pipeline measures through June 30, 2013 total 14,655 MWh and 255,190 MMBtu per year.

Small Business and Not-for-Profit. GJGNY energy assessments are offered statewide at no charge to small businesses and not-for-profits with an average electric demand of 100 kW or less and 10 employees or less. As of June 30, 2013, 1,662 GJGNY assessments have been completed.

The Small Commercial Energy Efficiency Program is working to better understand and continue to expand project implementation resulting from energy assessments. This effort includes improving the communication of energy assessment results to small business and not-for-profit customers, providing additional follow-up services to support implementation, and assisting in the development of an independent evaluation of the Program. In addition, the Small Commercial Energy Efficiency Program is currently seeking firms to provide energy assessments with expanded and strengthened implementation assistance services for small business and not-for-profit customers for the next phase of the Program through Request for Proposals (RFP) 2621.

4.1.1.3 Workforce Development, Outreach, and Marketing

Workforce Development. Between April 2013 and June 2013, GJGNY Workforce Development reports the following updates regarding Program Opportunity Notices (PONs).

On-the-Job Training (PON 2033). The Workforce Team made several changes to PON 2033 in June 2013. Category A, curriculum development funds for NYS Registered Apprenticeships and third party accredited building trades programs, is fully expended and has been closed. Under the revised PON 2033, “Category A” no longer appears in the solicitation, and as a result, the term “Category B” has also been removed and replaced with the title “On-the-Job Training for Clean Energy.” As a result, the PON was renamed “On-the-Job Training for Clean Energy.” Under the initiative, \$250,000 in GJGNY funds and \$500,000 in System Benefits Charge (SBC) funds were added and the solicitation due date was extended from December 31, 2013 to December 31, 2014. As a result of the addition of SBC funds, eligibility for participation has been expanded to include contractors doing business under EEPS and SBC programs. GJNY and SBC activities under PON 2033 are tracked separately.

Under Category A, NYSERDA contracted with a total of five training providers (LaGuardia Community College, The Urban League of Rochester, Local 32 BJ, Urban Green Council, and Solar One) to develop and deliver energy efficiency training ranging from basic weatherization and construction through more advanced training like Green Professional (GPRO) for union plumbers. Training providers are under contract to train a total of 765 individuals, of which 159 (21% of the total goal) have been trained through June 2013. Trainings under PON 2033 will continue for the next 12 months.

Under Category B, NYSERDA has executed on-the-job training agreements with 39 businesses seeking to hire new employees or advance incumbent workers under GJGNY. As of June 30, 2013, 142 people have been hired from NYS Department of Labor’s (DOL) Career Center lists, and 10 incumbent workers have been advanced due to training. Approximately \$1.18 million in wage and training subsidies has been awarded. The average wage of workers hired under the program is \$16.22 per hour.

Pressure Houses for Field Testing (PON 1816). The Champlain Valley Technical School (CV-TEC) submitted their revised timeline and finalized blueprints to committee members, the New York State Education Department's Office of Facilities Planning, and the project's engineering firm, ESE/Zebratech.

Northeast Parent and Child Society (NEPCS) continues renovations on their pressure house, a training facility for energy assessors, to meet the final design plan. Most of the house is rehabbed and painted. NEPCS is in the final process of acquiring quotes for the HVAC, hot water tank, windows and door replacement, in addition to deciding on what Building Performance Institute training props will be used in the house and the location of those props within the confines of the building. NEPCS has already scheduled one testing session at the house for another NYSERDA training provider, the Institute for Building Technology and Safety (IBTS).

The construction of the Kelder House, located at the State University of New York Ulster, is complete and will host a grand opening for the pressure house in fall 2013.

The pressure house at the Green Jobs training Center (GJTC), located in Long Island, is near completion. To date, GJTC has trained 232 individuals in BPI Building Analyst (BA), Envelope Professional, Heating Professional, Multifamily BA, Whole House Air Leakage Controller Installer, Occupational Health and Safety Administration 10, Environmental Protection Agency (EPA) Lead Renovation, Repair and Painting (RRP), EPA 608 certification. The GJTC is becoming a destination for practitioners seeking skills enhancement.

Oilheat Technician Training (PON 1817). Community Power Network (CPN) was funded under PON 1817 to offer oilheat technician training across New York State. To date CPN has trained 531 individuals, with 344 trained through the first half of 2013. Through June 2013, CPN delivered the following training: National Oilheat Research Alliance (NORA) Silver Certification (71 individuals trained); NORA Gold Certification (16 individuals trained); NORA Tank Certification (58 individuals trained); and Combustion Air, Venting, Efficiency and Carbon Monoxide (110 individuals trained).

Outreach. As of June 2013, CBOs initiated 3,709 of the received free/reduced-cost home GJGNY audit applications. Of those CBO initiated audit applications, 3,466 have been approved, and, 2,312 audits have been completed.

The numbers of retrofit projects resulting from the CBO Outreach effort steadily increased during the second quarter of 2013. As of June 30, 2013 there were 527 CBO initiated retrofits under contract. Of the 441 completed units, 265 units are market rate customers and 176 units are assisted customers. These CBO audit and project numbers are a subset of the comprehensive HPwES figures reported previously in this report.

CBO monthly webinars continue as scheduled, covering a variety of topics essential for outreach and marketing success such as program updates, sales training, financing clarification, and web-based portal training. During the second quarter of 2013, six on-site CBO status meetings were held.⁹

Training documents in support of the new NYSERDA HPwES Program Portal have been developed and a two-hour training lead by implementation contractor Conservation Services Group (CSG) is currently scheduled for July 2013. Upon the initial launch of the new portal in July, CBOs will have access to information about the specific projects to which they are linked. CBOs will be able to view all data currently available to Home Performance contractors. Access to this information is a benefit to the Outreach Program, as CBOs can assist in moving along stalled projects, especially when the delay is with the customer (e.g. missing paperwork). The CBO training ensures that all customer information is used correctly and appropriately.

People United for Sustainable Housing (PUSH) and Long Island Progressive Coalition continue to have success with their aggregation pilots. With an increase in volume and some changes in the participating contractor pool, PUSH is working with NYSERDA and CSG to recruit new HPwES contractors for its Friends and Neighbors Program. As the result of their aggregation pilot, PUSH referred eight workforce recruits to one of their aggregation contractors to interview for two open insulation technician crew positions. Both positions were filled by PUSH recruits. Another aggregation contractor contacted PUSH about potential job candidates. At the request of the HPwES contractor, PUSH posted two job openings on its website and social media platforms.

Downtown Manhattan Community Development Corporation (DMCDC) delivered both English and Chinese BPI Green Building Operator training. The initial two-week sessions were focused on basic building science and operation, building envelope, lighting, and heat transfer process. DMCDC recruited 12 students for the English session and 10 students for the Chinese session.

NYSERDA and CSG are in discussions with Building Performance Institute regarding opportunities for minority and women-owned businesses contractor development.

During the month of June 2013, several Upstate CBOs hit an obstacle when the small commercial auditing firm could no longer serve small businesses with more than 10 employees, due to ARRA funding no longer being available to support that business sector. Moving forward, CBOs will refer all small commercial customers that cannot be served by GJGNY to Economic Development Growth Extension Program (EDGE) contractors with the intention that they may be served by other NYSERDA programs.

⁹ Visit nyserda.ny.gov/mycbo for assistance locating a CBO in your area.

Marketing. CBOs generate leads from a number of sources. In order to support the varied capabilities of the CBOs, in terms of managing a prospect database, lead generation materials were developed to help systemize this process and make it easier for the CBOs to follow up with their leads. The goal is to keep the CBOs in front of their prospects and encourage prospects to move forward with work. The campaign includes a series of emails to encourage homeowners to move through the HPwES program by taking the next milestone step no matter where they are in the process.

New CBO locator pages have replaced the current geographic map on the NYSERDA website to make it easier for people to find and connect with their local CBO using their zip code. The Lead Generation or “CBO Locator” Page enables leads to better connect with individual CBOs. Current Drivers to the CBO Locator Page include the CBO article in HPwES Residential Magazine, HPwES Irreconcilable Temperatures microsite, and CBO-developed materials. Print ads promoting the Residential Financing options were developed and placed. Ads ran in the May editions of Clipper Magazine and Better Homes and Gardens. Outdoor ads and on-line banners followed in May.

A Green Jobs - Green New York financing print, outdoor, and digital ad campaign was developed and deployed. The campaign is aimed at increasing statewide awareness and participation in NYSERDA’s residential financing programs, including On-Bill Recovery financing and the Smart Energy Loan Program. The advertisements reinforce the idea that homeowners don’t need to sacrifice plans or purchases to afford home energy upgrades. Ads leverage the HPwES Irreconcilable Temperatures campaign to build continuity and support for the HPwES messaging. Staff met with the marketing contractor in June 2013 to discuss the marketing activities for the remainder of 2013 and potential marketing strategies for 2014. NYSERDA is currently conducting an assessment of the existing marketing materials to understand how they were used.

4.1.2 Residential Efficiency Services

NYSERDA currently offers a suite of programs that provide comprehensive energy services for single and multifamily existing buildings and new construction, including low-income households. In addition to energy savings, these programs provide significant health and safety benefits through comprehensive testing and verification, improved air quality, and improved comfort. Historically, these programs were funded through the System Benefits Charge (SBC), and more recently, through the Energy Efficiency Portfolio Standard (EEPS), and offer incentives to implement electric and gas efficiency measures. The Residential Efficiency Services programs allow NYSERDA to use RGGI funds for fossil-fuel based measures and renewable energy measures not eligible for SBC and EEPS incentives. Coordination of these funding sources expands the number of households served and ensures that opportunities for carbon reduction measures are not lost.

Multifamily Performance Program. The Multifamily Performance Program (MPP) serves residential buildings with five or more units. RGGI funds are used to supplement the program's current SBC and EEPS funding streams. Specifically, these funds are targeted at reducing oil, non-firm natural gas, steam, and propane energy use in multi-unit residential buildings and increasing the efficiency and performance of space and domestic water heating systems, ventilation systems, and building enclosures through system replacement and optimization.

All buildings receive program support for energy audits to determine what measures are cost effective, expected energy savings, and the costs to install them. Projects also receive implementation incentives. Sixty percent of the program funds are targeted to low-income and affordable housing. NYSERDA will coordinate closely with the Weatherization Assistance Program (WAP) to ensure the most effective use of RGGI funds.

Through June 30, 2013, RGGI funds supported 36 completed and installed energy-efficiency projects. The installed and pipeline projects are expected to save a total of 8,432 MWh and 427,080 MMBtu per year.

Multifamily Carbon Emission Reduction Program. The Multifamily Carbon Emissions Reduction Program (MCERP) is currently providing financial assistance and technical support to owners of multifamily buildings converting their heating systems from #6 fuel oil to cleaner fuel alternatives. Less carbon-intensive fuels include #2 fuel oil, biodiesel and biodiesel blends, natural gas, and renewable energy (geothermal and solar thermal). This program was positioned to help encourage early adoption of the City of New York's phase-out of #6 fuel oil and early compliance with city-level legislation, that requires all buildings that burn #6 fuel oil to switch to #4 oil or a cleaner equivalent (based on particulate parts per million). Converting #6 fuel oil-heated buildings to cleaner fuels will reduce carbon emissions, improve air quality, and produce positive public health benefits.

MCERP launched on April 4, 2011. By June 30, 2011 nearly all of the total \$6.5 million in RGGI funding was allocated to 190 conversion projects. This funding is anticipated to serve more than 30,000 multifamily units in more than 300 buildings. This program was available to the entire State, but only five applications came from areas outside of the five boroughs of New York City: four from Westchester County and one from Nassau County.

Through June 30, 2013, MCERP funds helped to offset 221,776 tons of CO₂ for installed and pipeline projects that otherwise would have been emitted over a 10-year period if these buildings had not switched from #6 oil to a cleaner burning alternative.

EmPower New York. EmPower New York (EmPower) provides cost-effective energy reduction services to households with incomes at or below 60 percent of the State Median Income. RGGI funding permits cost-effective oil and propane-efficiency measures such as insulation, blower-door assisted air sealing, and heating systems repair and replacements. All households meeting the income eligibility requirements will be eligible to apply for heating

efficiency assistance. NYSERDA will continue to fund electric and gas efficiency measures with EEPS funds, and will coordinate closely with the Weatherization Assistance Program (WAP) to ensure effective use of RGGI funds.

Through June 30, 2013, 937 energy efficiency projects were completed. The installed and pipeline projects are projected to save a total of 38,692 MMBtu per year.

Home Performance with ENERGY STAR[®]. Home Performance with ENERGY STAR[®] (HPwES[®]) is a comprehensive energy efficiency services program for existing one-to-four family homes that aims to decrease GHG emissions. Residential net energy use accounts for 29 percent of total energy demand in the State, compared to 17.7 percent nationally, so residential use is a larger issue here than in many other states.¹⁰

The program uses a network of service providers accredited by the Building Performance Institute (BPI) to perform diagnostic testing on the home, recommend improvements, determine the payback period for those improvements, and install improvements selected by the homeowner. RGGI funds are used to provide incentives for heating measures in households that heat with fuels other than natural gas or electricity. HPwES is delivered in coordination with GJGNY, which is described previously in this report and provides free or reduced costs audits and financing options.

Through June 30, 2013, 2,632 energy efficiency projects have been completed. The installed and pipeline projects are projected to save approximately 559 MWh and 94,744 MMBtu per year.

Case Study 1: RGGI Funding Helps Homeowner Ready His Duplex for Winter

RGGI dollars are being used in an innovative way in New York State to stimulate energy efficiency by paying for comprehensive home energy assessments and low-interest loans for home energy improvements. Through a RGGI-funded energy assessment, Tom Digrace learned about energy waste throughout his 1944 Buffalo-area duplex and what to do about it. He knew he had aging furnaces and that an addition to one side of the duplex was over a crawlspace, but the assessment uncovered other problems that were making his home drafty and his heating bills high. Inefficient furnaces were only part of the problem. The duplex needed attic and wall insulation, air sealing, energy-efficient water heaters, and programmable thermostats. Tom chose to implement all of his contractor's recommended upgrades, taking advantage of low-interest financing and a matching grant from the Assisted Home Performance with ENERGY STAR program. Now, his home has a smaller carbon footprint, is more comfortable, uses less energy, and costs less to heat and cool.

¹⁰ NYSERDA. 2013. *Patterns and Trends- New York State Energy Profiles: 1997-2011*. nyserdera.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/EA-Reports-and-Studies/Patterns-and-Trends.aspx

Green Residential Building Program. The Green Residential Building Program (GRBP)¹¹ is a market transformation initiative designed to change the building practices of the residential construction industry for single-family homes and multifamily homes with up to 11 dwelling units. The GRBP offers incentives to building owners who build and obtain certification that their newly constructed residences meet or exceed Leadership in Energy and Environmental Design® (LEED®) or National Green Building Standard guidelines, as well as other GRBP program-specific energy efficiency and health and safety requirements. Buildings meeting GRBP requirements will help to reduce energy use and greenhouse gas emissions, save water and other natural resources, use sustainable building materials, reduce waste, and improve indoor air quality. The GRBP provides an innovative approach to program design and is the second statewide program in the country to offer direct financial incentives to building owners for certified green residential buildings.

Through June 30, 2013, the GRBP has received a total of 480 incentive applications for 480 residential buildings; 254 of these buildings received incentives paid with RGGI funds; the balance of approved applications were paid using another funding source. These figures are cumulative since program inception in September 2010. Most projects that receive GRBP funding also receive incentives through NYSERDA's New York ENERGY STAR® Certified Homes Program, such that the projects' energy savings may not be solely attributable to the GRBP. The GRBP is an important addition to NYSERDA's suite of residential programs, and the RGGI-funded installed and pipeline projects have helped effectuate energy savings of approximately 2,689 MWh of electricity, 5,017 MMBtu of propane, and 32,971 MMBtu of natural gas through June 30, 2013.

Integral to the GRBP's market transformation approach is the need to increase the awareness of, and demand for, comprehensive building performance services while simultaneously building a network of trained, certified technicians (building performance evaluators). Through June 30, 2013, 19 technicians have been approved for program participation to verify GRBP building eligibility.

Solar Thermal Incentive Program. RGGI funds have been used to support incentives for the installation of solar thermal systems to replace fossil-fuel domestic hot water systems. Incentives have been available for new and existing multifamily and single-family buildings as well as small commercial properties. Incentives also will be fully coordinated with the MPP, HPwES, the New York ENERGY STAR® Certified Homes Program, and the Solar Thermal Incentive Program funded by the Renewable Portfolio Standard.

The Program Opportunity Notice for the Solar Thermal Program (PON 2149) was released on December 10, 2010. Currently, there are 90 approved installers. The Solar Thermal Program has received a total of 115 project applications, seven of which have since been cancelled. The remaining 108 projects represent RGGI-funded incentives totaling \$935,151.

¹¹ Public Authorities Law Section 1872(4) directs NYSERDA to create and administer a green residential building program in New York.

As of June 30, 2013, 91 solar thermal projects had been installed. The installed and pipeline projects are anticipated to save a total of 3,108 MMBtu annually.

4.1.3 Municipal Water and Wastewater Program

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

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

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

Through June 30, 2013, NYSERDA and EFC continued to initiate outreach to municipalities to discuss the WWEP and the benefits of participation in the program. Cumulatively, RGGI funds supported the technical energy analyses of 54 municipal wastewater treatment plants. Once installed, the measures currently recommended by the analyses are projected to save a total of 39,823 MWh and 54,355 MMBtu annually. Five technical energy analyses are ongoing.

4.1.4 Industrial Innovations Program

The Industrial Innovations program is a longer-term initiative that will support development and demonstration of technologies with substantial GHG reduction potential and technologies that are relevant to New York State manufacturing industries and building systems. Funded projects will focus mainly on innovations that reduce the use of fossil fuels, have high replication potential for New York State's manufacturing base, are likely to be cost-

effective, and are presently not supported under SBC programs. For Industrial Innovations, 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 reductions.

NYSERDA completed a competitive PON for Ultraviolet Light and Electron Beam Process Innovation and Market Transformation (PON 1641) and selected projects for RGGI funding. Twelve proposals were received, and RGGI funding was approved for three projects that requested a total of \$888,610. While project contracting was ongoing, two proposers retracted their projects. Consequently, NYSERDA contracted with the remaining project in the amount of \$547,487.

NYSERDA completed a competitive solicitation (RFP 2413, issued in January 2012) using a newly-refined strategy for Accelerating the Commercialization of Industrial Technologies (ACIT) focusing specifically on innovative technologies that have high replication potential for New York's manufacturing base. The program is funded at a \$5 million level, \$3.04 million of which is RGGI-funded. Several NYSERDA Research and Development contractors' technologies have been successfully demonstrated, and have existing business and marketing plans, but are not yet accepted in the marketplace. RFP 2413 invited these contractors to conduct multiple full-scale demonstrations of their proposals, with the intention of helping that technology establish a fleet of installations to get its "initial toe hold" in the marketplace, while capturing important lessons learned that will help encourage further replication. To maximize potential benefits to NYS, contractors' technologies are selected competitively based on a range of factors, including, but not limited to: energy and CO₂ reduction potential, technical integrity, economic potential, and replicability. The program requires each industrial demonstration site to involve a New York State engineering consultant, who will serve as a "commissioning agent" and be involved with the demonstration from start to finish. This requirement is expected to increase project success rate and enhance education and replication opportunities. All commissioning agents and demonstration site staff associated with a specific technology will meet regularly to share lessons learned and develop a best practices guidebook to accelerate transition of the technology to NYSERDA deployment programs and direct market uptake. The fleet of demonstrations for a given technology will have staggered starts, thus providing critical opportunity for knowledge to pass from demonstration to demonstration and into the wider marketplace. Aggressive technology transfer that includes testimonials from site personnel and commissioning agents will help establish credibility, minimize risk, and encourage the industrial-customer base to adopt innovative technologies. Four proposals were received and RGGI funding has been contracted for one project that requested and has been awarded \$1,848,637.

A second iteration of the ACIT program (RFP 2699, issued in March 2013) offers \$2.5 million of RGGI funds. Proposals are due August 13, 2013.

NYSERDA completed both rounds of a competitive solicitation (PON 2414, issued in March 2012, with due dates May 9 and September 26, 2012) for Innovation in the Manufacturing of Clean Energy Technologies (IMCET) focusing specifically on developing improvements to manufacturing processes that are used to mass-produce clean energy products. IMCET is a strategic companion to NYSERDA's vast efforts to improve performance of clean energy products. IMCET improves their manufacturability in order to produce them in the most efficient manner and thereby lower the cost of goods sold, which improves their market acceptance.

The program was initially funded at a \$2.5 million level, and a supplemental fund consisting of \$1,013,760 of RGGI funds has been added to support meritorious projects from the first round. (Projects selected in the second round received funds other than RGGI funds). Twenty proposals were received for the first round, eight of which were approved for funding, including three that were approved to receive RGGI funds. Approval is based on their associated reductions in GHG emissions, either at the factory where the clean energy product is made, or, due to the project's influence on increasing the availability and affordability of the clean energy product and the resultant benefits that accrue, when that product is used by customers. A slightly-revised version of this program has been re-named Transformative Technologies for Energy-Efficient Manufacturing (TTEEM), and a solicitation (PON 2736) was approved in March 2013 for subsequent issuance. PON 2736, with a face value of \$4.5 million, will offer \$2.5 million of RGGI funds and \$2 million of other non-RGGI funds. The due dates will be in mid- 2013 and early-2014.

Under Next Generation of Emerging Technologies for End-Use Efficiency (PON 1772), NYSERDA funded four projects with \$1,042,381 in RGGI funding. The projects funded included the demonstration of a Smart Grid Ready AC residential solar photovoltaic (PV) system, development of energy efficient power distribution system for data centers, a solid state disk based energy-efficient storage system for servers, and demonstrated performance of fisonic devices for steam customers. All four projects were contracted. The AC residential PV system project successfully demonstrated the reduced cost of a solar PV system using AC micro-inverters, a novel racking system, and non-traditional installers (roofers). The project to develop an energy-efficient power distribution system for data centers using cryogenic cooling was terminated because the project was unable to demonstrate near-term technical and economic feasibility. Performance testing of the fisonic devices is nearly complete, and the final report is expected to be completed by the second quarter of 2013. The final report on solid state disk storage for servers is expected to be completed by the third quarter of 2013.

4.2 Transportation

4.2.1 Transportation Research

The goal of the Transportation Research Program is to commercialize technologies, products, systems, and services that provide superior GHG reduction performance and cost-per-ton values. Activities include product development, field testing, performance validation, policy development, and business assistance associated with emerging products that provide verified GHG benefits. RGGI funding was used for 10 contracts in the transportation arena.

Work continues to develop electric vehicle infrastructure, including faster charging solutions and innovative business models to support growing customer demand. Five electric vehicles have been deployed in the New York City rental car fleet, both to demonstrate the technology and provide customers an opportunity to experience the technology. A regenerative shock absorber is in the works that can generate electrical power for accessory load or hybridized drive power. Alternative fuels, such as dimethyl ether (derived from woody biomass) are being developed for diesel substitutes. Advanced oil sensors will eliminate routine oil changes to only when oil change is necessary. This technology will usually extend the time between oil changes, reducing oil use, alerting operators to oil problems sooner, and preventing engine damage and efficiency losses. Similar models of this oil sensor have received more than \$3 million of funding for use in larger engines.

Vehicles have become smarter with inter-vehicle communication systems that work over wireless networks. The system can transmit truck and traveler information to avoid extra stops while better monitoring commercial traffic. In a separate project, traffic lights self-organize to create an automated, decentralized traffic control system. Each intersection has simple sensors that, when connected to other intersections, provide a collective intelligence for the transportation network.

Outside of vehicles, several projects have made progress in other transportation areas. A mechanical ferry docking system will reduce the amount of engine run time necessary to keep the boats at the dock. This technology will enable ships to throttle down or stop their engines while docked, representing a large portion of their run time and fuel usage. An airport organization system has been designed and tested that will optimize planes moving about an airport. Such a system will help reduce delays by about 10 percent, while also decreasing engine idling and avoiding millions of dollars worth of maintenance, operating, and crew time. A railway wheel inspection system is also in the processes of being commercialized. In total, \$1.2 million out of \$2.0 million has been invoiced in the transportation area of RGGI funding.

4.3 Power Supply and Delivery (PSD)

The objective of the two PSD programs is to help reduce greenhouse gas (GHG) emissions from the electric power sector in New York State. The initiative has both near-term and long-term components that will support a portfolio of diverse projects relating to electric power generation, transmission, and distribution systems. These projects will reduce GHG emissions throughout the sector and include the implementation of an integrated strategy enabling smart-grid functionality and maintenance of a diverse portfolio of efficient generation resources. The PSD programs are designed to simultaneously maintain system reliability, safety, and security.

4.3.1 Statewide Photovoltaic Program

The Statewide Photovoltaic Program focuses on reducing GHG emissions in the short term by helping establish a sustainable market for solar energy throughout New York State that includes targeted financial incentives. The program 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.

Through June 30, 2013, the Statewide Photovoltaic Program supported the installation of 367 solar photovoltaic systems with a total capacity of approximately 3,487 kW. It is estimated these systems will produce 4,386 MWh of electricity annually.

Recognizing the continued benefit of investing in PV in the Long Island region, an additional \$16.3 million was allocated to support the continuation of LIPA's Solar Pioneer program during the second quarter of 2013.

4.3.2 Advanced Power Technology Program

The Advanced Power Technology Program (AFTP) is designed to reduce GHG emissions in the long term. The program has two RGGI-funded focus areas: (1) advanced renewable energy, and (2) carbon capture, recycling, and sequestration. Other advanced power generation systems and technologies may be explored in the future.

4.3.2.1 *Advanced Renewable Energy*

The Advanced Renewable Energy component of the AFTP supports projects that foster the market introduction of a broad range of promising renewable energy technologies in New York State, including advanced biomass, tidal, and offshore wind technologies.

The largest single project, which was for \$5 million, was approved in June for a new Photovoltaic Manufacturing Consortium (PVMC). The Consortium is devoted to accelerating the development, commercialization, and manufacturing of next-generation PV technologies to harness the interdisciplinary capabilities required to rapidly develop and deploy breakthrough solar technologies. A Board of Directors is in place, tools and machines have been purchased, and a prototyping line is now operational and available to members. The PVMC in conjunction with the existing iCLEAN incubator is currently supporting six solar companies in the commercialization of their technologies. There is also collaborative activity with the U.S. Department of Energy and new business incubators to try to advance solar technology. Phase one of the 10 MW manufacturing development facility utilities build out is now complete and has been commissioned by the College of Nanoscale Science and Engineering (CNSE) Environmental Health and Safety group.

Four smaller research contracts are exploring other areas of renewable energy:

1. Anti-reflective coatings for photovoltaic panels will help produce more energy by scattering the sunlight through the solar material. Efficiency is increased, as well as higher performance at high temperatures and low angles of sunlight. A 100 -kW line is making solar cells in Halfmoon, New York, with plans to expand capacity to 10 MW.
2. A nanomaterial known as graphene is being developed as a conductor for photovoltaic sources and energy storage devices. The material is being scaled-up, with small sales completed. The physical properties are encouraging for future development of these devices.
3. A commercial wind plant analyzer will help increase the effectiveness and power output of large-scale wind turbines. This project has attracted over \$2 million in outside funding from the U.S. Department of Energy (DOE), and was proven to work well in field tests.
4. A completed study has taken stock of small-scale hydro sites for NYS and uncovered nearly 84 MW of undeveloped or underutilized small hydropower sites.

In total, \$1.5 million of the \$1.7 million allocated to these four projects has been invoiced.

In addition, a series of technical analyses that characterize and establish, on a preliminary basis, the suitability of an ocean site area for a wind energy project were conducted on behalf of a collaboration among the New York Power Authority, the Long Island Power Authority, and Con Edison to procure energy from a 350-700 MW offshore wind farm located in the New York City-Long Island harbor-bay area (also known as the New York Bight). These studies are intended to establish a baseline of knowledge of geophysical features, meteorology, climatology, and natural resources/biota in the affected ocean tract, and will provide some basis for supporting future leasing applications and project siting and development activities.

4.3.2.2 Carbon Capture, Recycling, and Sequestration

The Carbon Capture, Recycling, and Sequestration component of the APTP will focus on assessing and demonstrating carbon capture, reuse, compression, and transport technologies; characterizing and testing the State's geological sequestration potential; and supporting the development of carbon capture and sequestration demonstration projects in New York State.

The TriCarb Consortium for Carbon Sequestration project continued work to identify potential sequestration targets in Rockland County. The project, which is also supported by DOE, is performing a detailed geological analysis of Rockland County's Newark Basin bedrock. Analysis of data and cores taken from the borehole drilling is ongoing, including thin-section analysis, geochemical reaction experiments, and fluid analyses. Modeling of simulated CO₂ injection had begun. Permitting for a second characterization well, to be drilled at the Lamont-Doherty Earth Observatory in Palisades, NY, was nearly complete.

4.3.3 Competitive Greenhouse Gas Reduction (CGGR) Pilot

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

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

- Provide a framework for marketplace participants to compete for funding to support large GHG reduction projects primarily on a cost-per-ton of CO₂ equivalent basis.
- Reduce the costs of achieving the reduction goals of the CO₂ budget trading program by achieving CO₂ reduction through more efficient electricity generation.
- Result in additional benefits including job creation, leveraged capital investment to promote economic development, and environmental benefits.

The CGGR program is expected to attract a mix of proposals from the power generation sector for varied technologies and GHG reduction strategies. NYSERDA anticipates bid prices could range from \$5 to \$30 per ton per ton and total funding could deliver 500,000 to 3 million tons of CO₂ reductions. The first solicitation is under development and expected to be offered in the fourth quarter of 2013 with project awards starting in early 2014.

4.4 Multi-Sector Programs

4.4.1 Clean Energy Business Development

The Clean Energy Business Development Program seeks to create, attract, and grow industries in New York State that can exploit emerging business opportunities in clean energy and environmental technologies while supporting the goal of carbon mitigation. Key elements of the program include advanced industrial research and development of innovative technologies, providing risk capital and business assistance, and development of advanced research centers.

NYSERDA contracted with four companies for awards through the Renewable, Clean Energy and Energy-Efficiency Product Manufacturing Incentive Program (PON 1176). The program provided a total of \$6.0 million, with the majority of funding tied to manufacturing the defined products in New York State. In addition, NYSERDA selected nine companies to receive targeted business development funds, a total of \$750,000, to support activities

such as business plan development, go-to-market strategy, freedom-to-operate analysis, capital raising, supply chain development, quality management system development, or channel development. Also, a small project was contracted to provide linkages between the global investment community and early-stage clean energy technology companies in New York State.

4.4.2 Climate Research and Analysis

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.

In the second quarter of 2013, NYSERDA continued to conduct outreach activities related to the “Responding to Climate Change in New York State” (a.k.a. ClimAID¹²) project. A third well-attended webinar on steps New York State communities are taking to increase their resilience to future storms, under the current climate as well as into the future, was conducted.

The development of the New York Climate Change Science Clearinghouse (NYCCSC) is about to commence. The NYCCSC will access the extensive knowledge base of New York State’s public and private academic institutions and provide user-friendly, web-based public access to data and literature related to climate change science that is relevant to New York State. Competitive solicitation targeting research needs related to greenhouse gas reduction strategies and additional climate adaptation strategies are being planned.

Climate-related research also continues in support of New York State initiatives, including the New York State Energy Plan, the Cleaner, Greener Communities program, and the State’s Climate Action Plan.¹³

4.4.3 Regional Economic Development and Greenhouse Gas Reductions

The Regional Economic Development and Greenhouse Gas Reductions (REDGHG) Program is designed to support the Governor’s transformative plan to improve New York’s business climate and stimulate economic growth. For this purpose, 10 Regional Economic Development Councils (REDCs) were established in 2011. Through a performance based, community-driven approach, each REDC has designed and approved a strategic economic development plan for its region. To facilitate the delivery of State support, a Consolidated Funding Application (CFA) was created as the primary mechanism for eligible applicants to submit projects that advance the vision of each strategic plan. Within each of the REDC plans, clean energy strategies and opportunities have been identified as priority needs.

¹² Visit <http://www.nyserda.ny.gov/climaid> to read the ClimAid report.

¹³ Visit <http://www.dec.ny.gov/energy/80930.html> to see the New York State Climate Action Plan Interim Report.

The REDGHG program supports projects that are identified as priority initiatives consistent with a Regional Economic Development Council Strategic Plan and that are not otherwise provided financial support by other authority programs or initiatives. 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. Projects selected are capable of moving forward in the near term, while positioning the region for long-term economic growth. REDGHG complements other funding available through NYSERDA, but does not duplicate funds that are otherwise available from NYSERDA programs. Project funds can be used for implementation of measures and equipment including project design and engineering costs, infrastructure investments, and for demonstrations of new and emerging technologies and approaches. Given the focus on near-term benefits, funds were not made available for research and development projects or for product development. Eligible sectors include businesses, agri-businesses, municipalities (counties, towns, cities, or villages), local development corporations, business or municipal improvement districts, public and private institutions (e.g., universities, colleges, hospitals, schools), and not-for-profits. REDGHG focuses on several end uses including: transportation, manufacturing and industrial process, buildings, agriculture, municipal process, renewable electric generation, and district energy.

Through June 30, 2013, REDGHG has awarded \$12 million for 17 projects (out of 94 eligible projects submitted) as the result of a competitive solicitation conducted in 2012 through the Consolidated Funding Application. These projects are expected to save 3,687 MWh and 5,812 MMBtu annually. Projects are located in eight of the 10 REDC regions.

Case Study 2: RGGI Funds Help Skaneateles Reduce Emissions With a New Net-Zero Energy Building

RGGI funding is being used by the Village of Skaneateles to develop the first municipal net-zero energy building in New York State, as the village turns a vacant fire station into new village offices and police station. Achieving net-zero energy means the building will produce at least as much energy through renewable sources as it consumes on an annual basis. The project is expected to reduce energy usage from the electric grid by more than 62,000 kilowatt-hours annually and result in the avoidance of 46 metric tons of greenhouse gas emissions annually.

Renewable energy and energy efficiency measures include a 54-kW solar PV system and geothermal well field and heat pump system to provide on-site energy extracted from underground, LED lighting and green exterior upgrades such as increased insulation and energy efficient windows. The building will also have an educational energy display in the lobby so visitors can see how the building is performing.

Support for net-zero energy building construction is one aspect of New York State's comprehensive strategy to achieve RGGI carbon dioxide emission reduction goals through energy efficiency measures and renewable energy.

4.4.4 Cleaner, Greener Communities

The Cleaner, Greener Communities Program was announced by Governor Cuomo in his 2011 State of the State address. It builds on the Climate Smart Communities Program, which provides enhanced support for development and implementation of regional sustainability plans. This ensures that the State's ongoing and substantial investments in infrastructure help to move New York State as a whole toward a more environmentally sustainable future. The program encourages communities to use public-private partnerships and develop regional sustainable growth strategies in areas such as emissions control, energy-efficiency, renewable energy, low-carbon transportation, and other carbon reductions. The program emphasizes activities such as revitalizing urban areas through smart growth, creating green jobs, building green infrastructure, and strengthening environmental justice and protection.

The program has two primary components: (1) planning and updating regional sustainable growth plans and (2) implementation of the sustainability plans.

4.4.4.1 Planning

Ten region-specific planning teams were competitively selected to develop Regional Sustainability Plans, one for each of the ten Regional Economic Development Council regions. Seven regions received awards in the first round of planning grant funding in December 2011 and the remaining three regions received awards in the second round of funding in May 2012. Nine of the plans were completed in June 2013 and the final plan, a report that explores expanding the scope of New York City's existing sustainability plan, PlaNYC, will be completed by late fall 2013. Each team worked closely with their corresponding Regional Economic Development Council to ensure that the region's sustainability goals are coordinated with their Regional Economic Development Plans. All of the completed plans have been endorsed by their Regional Economic Development Councils.

4.4.4.2 Implementation

The implementation component of the program was launched on June 17, 2013 and proposals were received through the Consolidated Funding Application on August 12, 2013. Support will be provided for competitively selected project proposals that address specific items within the regions' sustainability plan. Projects that have garnered community buy-in, as well as those that include public-private partnerships, will be encouraged. Consideration will be given to support implementation projects in multiple types of communities (rural, suburban, and urban communities). RGGI proceeds can be used for the implementation of plan elements that fall within the scope of the permissible use of RGGI proceeds (energy efficiency, renewable energy, and innovative carbon reduction programs). Approximately 90 percent of the incentive budget will be used to support the implementation component of the program.

4.4.4.3 Outreach and Community Support

Outreach and community support for the overall Cleaner, Greener Communities program will be provided in part through Climate Smart Communities and the Economic Development Growth Extension program.

Climate Smart Communities. The Climate Smart Communities (CSC) program was established in 2009 by the Department of Environmental Conservation (DEC), the Department of State (DOS), the Public Service Commission (PSC), and NYSERDA. It operates under the joint management of DEC and NYSERDA. The CSC program was designed to strengthen and enhance the participating agencies' outreach to local governments (counties, towns, villages, and cities). NYSERDA has six firms under contract to provide technical assistance services through the CSC Regional Coordinators Pilot Program. These firms engage local communities in climate action planning, greenhouse gas emissions inventories, energy conservation, use and encouragement of low-carbon energy, improved waste management, reduction of transportation emissions, and adaptation to climate change through land-use and other planning. Regional greenhouse gas inventories were completed in the fourth quarter of 2012. In-person consultations with individual communities have been ongoing since the last quarter of 2012.

The first round of technical assistance services that resulted from consultations has been completed. In the second year of the program, each community will receive additional technical assistance, either to expand upon the previous year's activities or to start new initiatives. These services are providing direct support to communities, helping them respond to climate change and become more resilient to its effects, while also creating capacity for communities to do more on their own going forward.

Economic Development Growth Extension Program. The Economic Development Growth Extension (EDGE) Program, facilitated by Regional Outreach Contractors (ROCs), performs outreach, education, and promotion of NYSERDA program opportunities to residents, businesses, institutions and local governments across the State. The program includes support for Governor Andrew M. Cuomo's Regional Economic Development Council (REDC) initiative by aligning the program territories geographically and providing direct support to advance the strategic priorities and regionally significant projects identified in each region. Through this new alignment with the REDCs, NYSERDA can provide a greater level of education and adoption of energy-efficiency and renewable energy practices at the community level. Through June 2013, a customer relationship management (CRM) system has been developed and implemented, and CRM and program trainings have been conducted. Additionally, EDGE Program ROCs have established 165 new partnerships that have lead to 112 referrals from these new relationships. The ROCs have also participated in more than 100 public outreach events including the Consolidated Funding Application Workshop held in various locations across the State to support the efforts of the REDC initiative.

4.4.5 NY Green Bank

In his 2013 State of the State address, Governor Cuomo announced several initiatives to further advance New York State's clean energy successes. Central to his energy policies is a green bank that will focus on attracting private sector capital to spur investment in clean energy technologies. The mission of the NY Green Bank is to address financial market barriers that are impeding the flow of private capital into the clean energy sector. The NY Green Bank's vision is to foster an innovative and flexible energy marketplace that is able to react and adapt to evolving environmental and customer demand patterns. Products and services that the bank will likely provide include risk mitigation, credit enhancement, project aggregation for rooftop solar and energy efficiency projects, contract standardization, and data collection. NYSERDA's Green Jobs-Green New York program will provide a good foundation for the NY Green Bank. Guiding principles for NY Green Bank activities will focus on strategies to address sectors or technologies where insufficient capital exists for energy efficiency and renewables, or where the terms of available capital are not attractive to drive demand.

The NY Green Bank is a cost-effective, powerful and complementary addition to New York State's existing portfolio of clean energy support programs. It will provide unique value that current programs alone cannot deliver. The NY Green Bank will enable private sector financing to reach currently underserved markets, thus further increasing the penetration of proven clean energy technologies. By focusing on market gaps and following its operating principles, the NY Green Bank will be able to leverage multiples of private capital investment for each public dollar contributed, thereby substantially increasing the total funding available to the clean energy sector. Unlike incentive payments, when ratepayer funds are used for the financing products proposed for the NY Green Bank, those funds are not permanently expended. Instead, the funds invested by the NY Green Bank will be returned to the NY Green Bank and will be available to deploy again to achieve additional energy and environmental benefits. This recycling effect permits New York State to maintain a minimum level of financial commitment to the clean energy economy without having to return to the ratepayers for one-time expendable grant or incentive funding. In sum, the NY Green Bank will allow New Yorkers to transition away from their primary reliance on an exhaustible grant and incentive model to generate the environmental and economic benefits of clean energy deployment.

Table 4-3. NY Green Bank Available Funding and Financial Status through June 30, 2013 (millions of dollars)

	Budgeted Funds ^a	Expended Funds ^b	Open Encumbrances ^c	Pre-Encumbrances ^d	Committed Funds ^e
Program Costs					
NY Green Bank	22.3	-	-	-	-
SUBTOTAL	22.3	-	-	-	-
Other Costs					
Program Administration	1.9	-	-	-	-
Program Evaluation	-	-	-	-	-
New York State Cost Recovery Fee	0.04	-	-	-	-
OTHER COSTS TOTAL	2.0	-	-	-	-
TOTAL	24.3	-	-	-	-

^a Includes auction proceeds and allocated interest on the Green Jobs-Green New York (GJGNY) funds. The allocation is consistent with the three-year budget presented in the 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.

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

4.5 Program Evaluation

Several RGGI evaluation studies are underway or in the planning stages as of the second quarter of 2013. The study objectives and timing are discussed in the following sections.

4.5.1 Impact Evaluation

Impact evaluation measures the outcomes and co-benefits attributable to a program, calculates the cost-effectiveness of a program, and compares the outcomes to the goals set forth for the program. Impact evaluations underway or planned for the current cycle include:

- Multifamily Performance Program - A major, in-progress impact evaluation of the SBC/EEPS-funded MPP is being leveraged to assess the impacts of RGGI fuel efficiency incentives. The study, conducted by ERS (NYSERDA's Impact Evaluation contractor for deployment programs), will include measurement and verification of energy savings, and attribution analysis of projects completed from 2009 through 2011. The study is currently in the field and is expected to be completed in early 2014.
- Multifamily Carbon Emission Reduction Program - NYSEERDA is currently working with ERS to plan an impact evaluation to measure and verify the fuel use and emission impacts attributable to the program. The evaluation is expected to begin with data collection in late 2013 and be completed in mid- to late-2014.
- Home Performance with ENERGY STAR Program - NYSEERDA is currently working with ERS to plan an assessment of energy and emission impacts from Green Jobs-Green New York "audit only" participants who may have installed measures on their own in the absence of incentives. NYSEERDA will also undertake an evaluation to measure and verify impacts attributable to RGGI fuel incentives. These studies will leverage major, in-progress evaluation of the SBC/EEPS-funded HPwES Program. The completion date for this study has yet to be determined.

- Municipal Water and Wastewater Program - NYSERDA is currently working with ERS to plan an impact evaluation to measure and verify energy savings and emission impacts attributable to the program. The study will begin in 2014.
- Cost-Effectiveness Assessment Methods Study - A study is currently underway by ICF Consulting (NYSERDA's Economic/Environmental Evaluation contractor) to identify and recommend best practices for assessing cost effectiveness of research, development, demonstration and market-based programs. This study is jointly funded with RGGI and other NYSERDA funds. The study is expected to be completed in early 2014 and will help inform future cost-effectiveness analysis of RGGI research, development, demonstration, and market-based programs.
- Residential Non-Energy Impact Study - A study is currently underway by ICF Consulting to identify and begin to quantify measurable non-energy impacts from residential programs, including possibly HPwES and the Green Residential Building Program. This study is jointly supported with RGGI and other NYSERDA funds. The study is expected to be completed in early 2014 and is expected to help inform future non-energy impact analysis and reporting for RGGI programs.
- Green Jobs-Green New York Jobs Quantification Study - This study is conducted by NMR Group and ICF Consulting to quantify the direct, indirect and induced jobs created/retained from the GJGNY program, including those in disadvantaged communities. The study also examines changes in worker skill level and wages resulting from the GJGNY program. The job impacts assessment is using a two-phased approach. Phase 1 (by NMR Group) involves primary data collection via telephone surveys of various GJGNY market actors. Phase 2 (by ICF Consulting) involves a macroeconomic assessment of indirect jobs. NYSERDA expects to issue a final report that includes results of both phases in late 2013.

4.5.2 Process Evaluation/Market Characterization and Assessment

Process evaluation reviews oversight and operations, gauges customer satisfaction and recommends process and efficiency improvements. Market characterization and assessment develops an understanding of markets and market actors; provides information to support program design and delivery; and tracks changes in markets over time.

Process and market evaluations underway or planned for the current cycle include:

- Multifamily Performance Program - A major, in-progress process/market evaluation of the SBC/EEPS funded MPP is being leveraged to assess the RGGI fuel efficiency incentive activity and GJGNY audit/loan activity. The study, conducted by Research Into Action (NYSERDA's Process/Market Evaluation contractor), is currently underway to assess program experience, identify program improvements, and characterize and assess the market for supported technologies and services. The study is expected to be completed in the first part of 2014.
- Home Performance with ENERGY STAR Program - A major, in-progress process/market evaluation of the SBC/EEPS-funded HPwES is being leveraged to assess the RGGI fuel efficiency incentive activity and GJGNY audit/loan activity. The study is currently being planned with Research Into Action to assess program experience, identify program improvements, and characterize and assess the market for supported technologies and services. The study is expected to be completed in late 2014.

- GJGNY Constituency Based Organization (CBO) Program - The CBO initiative evaluation, conducted by Research Into Action, is using case studies and in-depth interviews of CBOs to explore various program objectives and to understand the success and barriers experienced by CBOs. The interviews commenced in late April 2013, and were completed in June 2013. NYSERDA is working toward having preliminary results in September 2013. In addition to the case studies and in-depth interviews, the CBO-related activities will be evaluated as a part of the HPwES process evaluation planned for later in 2013. Data collection through the HPwES evaluation will allow CBOs additional time to generate retrofit projects and will limit the survey burden on HPwES participants and contractors.
- GJGNY Small Business/Not-for-Profit Program - Research Into Action is currently conducting a study to examine program operations, characterize, and understand small commercial and not-for-profit offerings in New York and other areas through benchmarking best practices, identify reasons for participation and measure implementation, and provide recommendations for program improvement. The evaluation is using a phased approach. Phase 1 is underway. Primary data collection via interviews of participating lenders is complete and analysis has begun. Telephone surveys of participants commenced in early June 2013 and are expected to continue through July 2013. Secondary research to characterize the small commercial and not-for-profit programs offered in New York and other jurisdictions continues. Phase 1 will conclude in late 2013. The scope of Phase 2 is under development and is planned to include research with non-participating small commercial and not-for-profit organizations, lenders, and loan originators.

4.5.3 Baseline Studies

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

The Residential baseline study is currently well underway, with telephone and web-based surveys beginning in the fourth quarter of 2013, and on-site data collection beginning shortly thereafter. The Residential study is expected to conclude in early 2014.

The Commercial baseline is currently being scoped. In the third quarter of 2013, NYSERDA Evaluation staff will seek management approval to issue a Request for Proposals to hire a contractor to conduct the study. Study planning and implementation is expected to begin in early 2014.

Appendix A

This appendix describes the general methods and assumptions that are used to calculate the energy savings, emission reductions, bill savings, and cost-effectiveness metrics presented in the New York's Regional Greenhouse Gas Initiative Investment Plan (2013 Operating Plan).

A.1 Energy Savings

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

A.2 CO₂e Reductions

Emissions factors are used to translate the energy savings data into annual GHG emissions reduction values. The GHGs evaluated in the report include carbon dioxide, methane, and nitrous oxide. Because each of these gases has a different global warming potential,¹⁴ emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO₂e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,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 ₂ O)	310

¹⁴ A global warming potential is a measure that estimates how much a given mass of a GHG contributes to global warming. It is calculated over a specific time interval, which is 100 years for the IPCC Second Assessment Report values.

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. New York DEC regulation Part 242.1.2 (49) uses the Third Assessment values. Reconciliation between these two methodologies will be investigated as part of the program implementation and evaluation process.

Table A-2 shows the emission factors used in the Plan to calculate emissions from on-site fuel combustion, which are derived from U.S. Environmental Protection Agency (EPA) emission coefficients. The CO₂e values represent aggregate CO₂, CH₄, and N₂O emissions. If a program in the Plan covers more than one sector (e.g., the Commercial and Industrial Program) then the estimated reduction is based on a straight average emission factor.

Table A-2. Fuel Combustion Emission Factors by Sector

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

	Transport (lb CO₂e/MMBtu)	Residential (lb CO₂e/MMBtu)	Commercial (lb CO₂e/MMBtu)	Industrial (lb CO₂e/MMBtu)
Coal	0.00	224.89	211.43	207.58
Natural Gas	117.25	117.14	117.14	113.38
#2 Oil/Distillate/Diesel	163.22	163.78	163.78	161.80
#6 Oil/Residual	-	-	166.28	174.20
Kerosene	-	162.10	162.10	159.89
Propane	140.51	136.94	136.94	139.45
Gasoline	159.09	-	-	-
Aviation Fuel	160.86	-	-	-
Wood	-	15.79	15.79	3.92
Steam		139.30	139.30	

An average emission factor of 826 lb CO₂e/MWh is used to estimate emission reductions associated with electricity use reductions for all sectors. This value includes emissions from in-state electricity generation as well as emissions associated with net-imports of electricity.¹⁶ Although electricity savings may not lead to near-term emission reductions under the RGGI CO₂ cap, savings will potentially reduce imports of electricity to New York; the demand for CO₂ allowances, leading to a possible future reduction in the cap; and the carbon-footprint of end-users, as they will be responsible for a smaller percent of the emissions associated with electricity production.

¹⁶ The emission factor for electricity is based on data from Patterns & Trends- New York State Energy Profiles: 1997 – 2011 (NYSERDA 2013) and methodology from the GHG Inventory and Forecast prepared for the 2009 New York State Energy Plan (August 2009).

A.3 Bill Savings

Annual bill savings values for each program are estimated by multiplying the energy savings by sector-specific fuel price data. Table A-3 shows fuel prices by sector. Electricity and natural gas prices represent average values for six service territories weighted by the percentage of RGGI projects located in each utility area; basic service charges have been excluded.

Table A-3. Fuel Prices by Sector¹⁷

Sector	Electricity (\$/kWh)	Natural Gas (\$/MMBtu)	Fuel Oil / Distillate (\$/MMBtu)	Propane (\$/MMBtu)
Residential	0.19	10.17	25.59	34.21
Commercial	0.22	7.26	24.51	26.04
Industrial	0.12	7.25	23.39	30.32
Transportation	0.05	N/A	27.58	N/A
C&I	0.17	7.26	23.95	28.18

Sector	Residual			
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

¹⁷ For electricity and natural gas, prices are an average of January and July 2011 prices as reported by the NYS Department of Public Service billing data, available at: <http://www3.dps.ny.gov/W/PSCWeb.nsf/All/C56A606DB183531F852576A50069A75D?OpenDocument>. For all other fuel types, prices reflect 2011 retail prices as reported in NYSERDA's *Patterns and Trends- New York State Energy Profiles: 1997-2011*

Appendix B

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

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State of New York
Andrew M. Cuomo, Governor

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