

New York State Energy Research and Development Authority

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# New York's RGGI-Funded Programs Status Report

Quarter Ending March 31, 2013

September 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 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 – including programs to support product research, development, and demonstrations; clean-energy business development; and the knowledge-based community at the Saratoga Technology + Energy Park®.

### Energy Education and Workforce Development

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

### Energy and the Environment

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

### Energy Data, Planning and Policy

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



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# 1 Introduction

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To implement the Regional Greenhouse Gas Initiative (RGGI), New York State established its Carbon Dioxide (CO<sub>2</sub>) Budget Trading Program through regulations promulgated by the Department of Environmental Conservation (DEC) and the CO<sub>2</sub> Allowance Auction Program through regulations promulgated by the New York State Energy Research and Development Authority (NYSERDA).<sup>1</sup> This report is prepared pursuant to the “Operating Plan for Investments in New York under the CO<sub>2</sub> Budget Trading Program and the CO<sub>2</sub> Allowance Auction Program” (Operating Plan),<sup>2</sup> and provides an update on the progress of programs through the quarter ending March 31, 2013. It contains an accounting of program spending, an estimate of program benefits, and a summary description of program activities and implementation. An amendment providing updated program descriptions and funding levels for the 2013 version of the Plan was approved by NYSERDA’s Board of Directors on June 17, 2013.<sup>3</sup>

New York State invests RGGI proceeds to support comprehensive strategies that best achieve the RGGI CO<sub>2</sub> 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 realistic, low-emitting technologies.

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<sup>1</sup> For the DEC adopted regulations, see 6 NYCRR Part 242: CO<sub>2</sub> Allowance Auction Program Regulations.

<sup>2</sup> On June 21, 2010, NYSERDA Part 242: CO<sub>2</sub> Budget Trading Program Regulations; for the NYSERDA 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.nyserra.ny.gov/BusinessAreas/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx?sc\\_database=web](http://www.nyserra.ny.gov/BusinessAreas/Energy-and-the-Environment/Regional-Greenhouse-Gas-Initiative/Auction-Proceeds.aspx?sc_database=web)) for ongoing developments.

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

## 1.1 New York's RGGI Funds<sup>4</sup>

As of March 31, 2013, New York State sold more than 197.5 million CO<sub>2</sub> allowances and received nearly \$450.5 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.

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

**Table 1-1. New York State's RGGI Auction Results<sup>5</sup>**

<b>Auction Date</b>	<b>Control Period</b>	<b>Clearing Price</b>	<b>New York State Allowances Sold</b>	<b>New York State Auction</b>
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	-	-
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
First Control Period Total			142,786,651	\$331,821,129
Second Control Period Total			54,715,803	\$118,673,381
TOTAL			197,502,454	\$450,494,510

Source: RGGI Inc.

<sup>5</sup> 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 1-2. New York State's RGGI Funds through March 31, 2013**

<b>Fund Category</b>	<b>Cumulative Funds</b>
RGGI Auction Proceeds	<b>\$450,494,510</b>
Interest Allocated to the RGGI Portfolio	\$3,026,525
Interest Allocated to the GJGNY Program	\$770,000
<b>TOTAL</b>	<b>\$454,291,035</b>

## 2 Budget and Spending Status

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This section presents financial data for the approved RGGI programs through March 31, 2013. Table 2-1 reflects how the nearly \$454.3 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 March 31, 2013 (\$ million)**

	Budgeted Funds <sup>a</sup>	Expended Funds <sup>b</sup>	Open Encumbrances <sup>c</sup>	Pre-Encumbrances <sup>d</sup>	Committed Funds <sup>e</sup>
<b>Residential/Commercial/Industrial/Municipal</b>					
Residential Efficiency Services	38.3	17.7	10.5	5.6	33.7
Municipal Water and Wastewater	1.9	1.1	0.5	0.0	1.6
Industrial Process Improvement	11.3	1.6	2.9	2.5	7.0
<b>Total Residential/Commercial/Industrial/Municipal</b>	<b>51.5</b>	<b>20.4</b>	<b>13.8</b>	<b>8.1</b>	<b>42.3</b>
<b>Transportation</b>					
Transportation Research	2.0	1.2	0.3	0.5	2.0
<b>Total Transportation</b>	<b>2.0</b>	<b>1.2</b>	<b>0.3</b>	<b>0.5</b>	<b>2.0</b>
<b>Power Supply and Delivery</b>					
Statewide Photovoltaic Initiative	24.1	11.3	0.1	-	11.3
Advanced Power Technology	3.9	3.5	0.4	-	3.8
Competitive Greenhouse Gas Reduction Pilot	14.5	-	-	-	-
<b>Total Electric Power Supply and Delivery</b>	<b>42.5</b>	<b>14.7</b>	<b>0.4</b>	<b>-</b>	<b>15.2</b>
<b>Multi-Sector</b>					
Climate Research and Analysis	7.1	2.3	2.2	1.4	5.9
Clean Energy Business Development	20.7	4.7	5.7	1.5	11.9
			1.0		
Regional Economic Development and GHG Reduction	12.4	-	-	11.0	12.0
Cleaner Greener Communities	53.9	7.7	6.1	5.7	19.5
Green Bank	8.4	-	-	-	-
<b>Total Multi-Sector</b>	<b>102.5</b>	<b>14.7</b>	<b>15.0</b>	<b>19.6</b>	<b>49.3</b>
<b>Other Costs<sup>f</sup></b>					
Deficit Reduction Plan (DRP) Transfer <sup>g</sup>	90.0	90.0	-	-	90.0
Con Edison Smart Grid Program <sup>h</sup>	13.2	13.2	-	-	13.2
Program Administration <sup>i</sup>	18.9	8.3	-	-	8.3
Metrics and Evaluation	11.5	0.3	1.8	2.0	4.1
RGGI Inc. Costs <sup>j</sup>	5.0	4.1	-	-	4.1
New York State Cost Recovery Fee	4.3	1.8	-	-	1.8
<b>OTHER COSTS TOTAL</b>	<b>143.0</b>	<b>117.7</b>	<b>1.8</b>	<b>2.0</b>	<b>121.5</b>
<b>SUBTOTAL</b>	<b>341.5</b>	<b>168.8</b>	<b>31.3</b>	<b>30.2</b>	<b>230.3</b>
<b>Green Jobs - Green NY</b>					
Green Jobs - Green NY	112.8	58.8	12.8	14.0	85.7
<b>TOTAL<sup>k</sup></b>	<b>454.3</b>	<b>227.6</b>	<b>44.2</b>	<b>44.3</b>	<b>316.0</b>

<sup>a</sup> 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.

<sup>b</sup> Invoices processed for payment by NYSERDA.

<sup>c</sup> Remaining funding obligated under a contract, purchase order or incentive award.

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

<sup>e</sup> The sum of Expended, Encumbered and Pre-Encumbered funds.

<sup>f</sup> 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.

<sup>g</sup> 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.

<sup>h</sup> On December 22, 2009, NYSERDA's Board approved a proposed consent decree that resolves the legal challenge to the State's RGGI program. The parties to the consent decree estimate that the total commensurate benefit for years 2009 - 2014 is \$12.3 million and agreed to dedicate such funds for the development of smart grid technologies in the Con Edison territory. 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.

<sup>i</sup> Includes NYSERDA's upfront administrative expenses related to the development and implementation of the CO<sub>2</sub> Budget Trading Program, the CO<sub>2</sub> Allowance Auction program, and the Operating Plan.

<sup>j</sup> 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 CO<sub>2</sub> Budget Trading Program.

<sup>k</sup> Totals may not sum exactly due to rounding.

Source: NYSERDA

### 3 Summary of Portfolio and Program Benefits

Table 3-1 and Table 3-2 show the estimated cumulative annual benefits as of March 31, 2013 at the portfolio and program levels, respectively.<sup>6</sup> 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 Cumulative Portfolio Benefits through March 31, 2013**

Cumulative Annual through March 31, 2013	Installed Savings <sup>1</sup>	Pipeline Savings <sup>2</sup>	Total Savings <sup>3</sup>
Net Greenhouse Gas Emission Savings <sup>4</sup> (Annual Tons CO <sub>2</sub> e <sup>5</sup> )	60,349	52,397	112,746
Net Electricity Savings (Annual MWh)	18,206	11,812	30,019
Renewable Energy Generation (Annual MWh <sup>6</sup> )	4,305	-	4,305
Net Natural Gas Savings (Annual MMBtu)	231,225	90,488	321,713
Net Fuel Oil Savings (Annual MMBtu)	378,533	317,149	695,682
Net Propane Savings (Annual MMBtu)	18,848	7,747	26,595
Net Steam Savings (Annual MMBtu)	15,969	37,123	53,092
Net Wood Savings (Annual MMBtu)	5,129	1,338	6,467
Net Kerosene Savings (Annual MMBtu)	1,359	353	1,713
Net Gasoline Savings (Annual MMBtu)	-	-	-
Net Residual Oil Savings (Annual MMBtu)	144	27	172
Net Diesel Savings (Annual MMBtu)	-	-	-
Net Coal Savings (Annual MMBtu)	357	-	357
Total Fuel Savings (Annual MMBtu <sup>7</sup> )	651,564	454,225	1,105,790
Annual Energy Bill Savings to Participating Customers (\$ Million <sup>8</sup> )	16.3	11.4	27.7

<sup>a</sup> Inclusive of savings from all currently operational projects installed since program inception.

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

<sup>c</sup> The sum of Installed Savings and Pipeline Savings.

<sup>d</sup> 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.

<sup>e</sup> CO<sub>2</sub>e stands for carbon dioxide equivalent and describes the amount of CO<sub>2</sub> that would have the same global.

<sup>f</sup> Installed renewable energy generation decreased from the previous quarter due to reprogramming of funds.

<sup>g</sup> 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.

<sup>h</sup> 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.

Source: NYSERDA

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

**Table 3-2. Summary of Cumulative Program Benefits through March 31, 2013**

Program	Net Energy Savings (Annual MMBtu)			Net Electricity Savings or Renewable Energy Generation (Annual MWh)			Net Greenhouse Gas Emission Savings <sup>1</sup> (Annual Tons CO <sub>2</sub> e <sup>2</sup> )		
	Installed Savings <sup>3</sup>	Pipeline Savings <sup>4</sup>	Total Savings <sup>5</sup>	Installed Savings <sup>3</sup>	Pipeline Savings <sup>4</sup>	Total Savings <sup>5</sup>	Installed Savings <sup>3</sup>	Pipeline Savings <sup>4</sup>	Total Savings <sup>5</sup>
<b>Residential, Commercial, Industrial &amp; Municipal Sectors</b>									
<i>Green Jobs - Green New York</i>									
GJGNY - Single-Family Residential Audit Component <sup>6</sup>	289,266	124,920	414,186	3,759	1,624	5,383	20,646	8,923	29,569
GJGNY - Single-Family Residential Loan Component <sup>6</sup>	156,907	20,889	177,796	2,311	308	2,619	11,371	1,513	12,884
GJGNY - Multifamily Residential Audit Component <sup>6</sup>	118,936	38,690	157,626	9,444	3,008	12,452	12,212	3,942	16,154
<i>Residential Efficiency Services</i>									
Multifamily Performance Program	172,633	275,511	448,144	3,692	5,971	9,663	15,552	24,850	40,402
Multifamily Carbon Emissions Reduction Program <sup>7</sup>	-	-	-	-	-	-	6,124	14,497	20,621
EmPower New York	20,674	10,200	30,874	-	-	-	1,615	797	2,412
Home Performance with ENERGY STAR <sup>®</sup>	67,981	13,889	81,870	385	191	577	6,027	1,282	7,308
Green Residential Building Program <sup>6</sup>	14,489	22,869	37,358	744	1,365	2,109	1,170	1,912	3,082
Solar Thermal Incentive Program	2,341	695	3,035	-	-	-	166	56	222
<b>Power Supply &amp; Delivery</b>									
Statewide Photovoltaic Program <sup>8</sup>	-	-	-	4,305	-	4,305	1,778	-	1,778
Cross-Program Overlap <sup>9</sup>	191,663	53,437	245,100	2,129	654	2,783	16,312	5,374	21,686
<b>TOTAL</b>	<b>651,564</b>	<b>454,225</b>	<b>1,105,790</b>	<b>22,511</b>	<b>11,812</b>	<b>34,324</b>	<b>60,349</b>	<b>52,397</b>	<b>112,746</b>

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

<sup>b</sup> CO<sub>2</sub>e stands for carbon dioxide equivalent and describes the amount of CO<sub>2</sub> 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.

<sup>c</sup> Inclusive of savings from all currently operational projects installed since program inception.

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

<sup>e</sup> The sum of Installed Savings and Pipeline Savings.

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

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

<sup>h</sup> Installed Renewable energy generation and emission savings decreased from the previous quarter due to reprogramming of funds.

<sup>i</sup> 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<sup>®</sup> Program.

Source: NYSERDA

## 4 Program Activities and Implementation<sup>7</sup>

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### 4.1 Residential, Commercial, Industrial, and Municipal Sectors

#### 4.1.1 Green Jobs – Green New York (GJGNY)

GJGNY is a statewide program created to promote energy efficiency, the installation of clean technologies, to reduce energy costs, and reduce greenhouse gas emissions. GJGNY provides free and reduced cost energy audits to single family, multifamily, small business, and not-for-profit building owners as well as reduced cost financing options for completing the energy efficiency services. GJGNY is also designed to support sustainable community development and create opportunities for green jobs. The GJGNY Annual Report was issued on September 30, 2012<sup>8</sup>. Table 4-1 presents financial data for the approved GJGNY programs through March 31, 2013.

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<sup>7</sup> 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.

<sup>8</sup> For more information, see the [Green Jobs-Green New York Annual Report](http://www.nysersda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Green-Jobs-Green-New-York-Planning/Reports-and-Operating-Plans.aspx) (<http://www.nysersda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Green-Jobs-Green-New-York-Planning/Reports-and-Operating-Plans.aspx>)

**Table 4-1. Green Jobs – Green New York Available Funding and Financial Status through March 31, 2013 (\$ million)**

	Budgeted Funds <sup>a</sup>	Expended Funds <sup>b</sup>	Open Encumbrances <sup>c</sup>	Pre-Encumbrances <sup>d</sup>	Committed Funds <sup>e</sup>
<b>Workforce Development, Outreach and Marketing</b>					
Workforce Development	8.0	2.4	3.1	0.4	6.0
Outreach and Marketing	10.5	5.8	4.4	0.1	10.3
<b>Total Workforce Development, Outreach and Marketing</b>	<b>18.5</b>	<b>8.3</b>	<b>7.5</b>	<b>0.5</b>	<b>16.3</b>
<b>Residential</b>					
Energy Audit Incentive	14.6	8.2	-	1.4	9.7
Implementation Costs	1.0	0.6	0.3	0.0	0.9
Financing: Loans	26.7	29.5	(0.0)	4.2	33.7
Financing: Loan Repayments	-	(3.2)	-	-	(3.2)
Financing: Implementation Costs	-	1.7	0.3	0.7	2.7
<b>Total Financing</b>	<b>26.7</b>	<b>28.0</b>	<b>0.3</b>	<b>4.9</b>	<b>33.3</b>
<b>Total Residential</b>	<b>42.2</b>	<b>36.8</b>	<b>0.7</b>	<b>6.4</b>	<b>43.9</b>
<b>Multifamily</b>					
Energy Audits	5.4	2.8	0.7	0.2	3.7
Implementation Costs	-	-	-	-	-
Financing: Loans	10.3	1.6	0.1	0.04	1.8
Financing: Loan Repayments	-	(0.1)	-	-	(0.1)
Financing: Implementation Costs	0.3	0.1	0.2	-	0.3
<b>Total Financing</b>	<b>10.6</b>	<b>1.6</b>	<b>0.2</b>	<b>0.0</b>	<b>1.9</b>
<b>Total Multifamily</b>	<b>16.0</b>	<b>4.5</b>	<b>0.9</b>	<b>0.2</b>	<b>5.6</b>
<b>Small Commercial</b>					
Energy Audits	5.6	2.3	1.5	4.8	8.7
Implementation Costs	4.8	0.2	0.2	2.1	2.5
<b>Total Financing</b>	<b>10.3</b>	<b>0.2</b>	<b>0.3</b>	<b>0.0</b>	<b>0.5</b>
<b>Total Small Commercial</b>	<b>20.7</b>	<b>2.8</b>	<b>2.0</b>	<b>7.0</b>	<b>11.8</b>
<b>SUBTOTAL</b>	<b>97.4</b>	<b>52.4</b>	<b>11.1</b>	<b>14.0</b>	<b>77.5</b>
<b>Other Costs</b>					
Program Administration	7.8	4.7	-	-	4.7
Program Evaluation	5.6	0.9	1.8	-	2.7
New York State Cost Recovery Fee	1.9	0.8	-	-	0.8
<b>OTHER COSTS TOTAL</b>	<b>15.3</b>	<b>6.4</b>	<b>1.8</b>	<b>-</b>	<b>8.2</b>
<b>TOTAL</b>	<b>112.8</b>	<b>58.8</b>	<b>12.8</b>	<b>14.0</b>	<b>85.7</b>

<sup>a</sup> 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.

<sup>b</sup> Invoices processed for payment by NYSERDA.

<sup>c</sup> Remaining funding obligated under a contract, purchase order or incentive award.

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

<sup>e</sup> The sum of Expended, Encumbered and Pre-Encumbered funds.

#### **4.1.1.1 Financing**

*Single-Family Residential.* Plans for a solution to invite additional lenders to originate On-Bill-Recovery (OBR) and Smart Energy Loans have been put on hold. Due to the complexity of the financing program and the shift toward systems integration through the Optix platform, NYSERDA has opted to continue working with Energy Finance Solutions (EFS) as the sole originator of residential GJGNY loans.

The target date for NYSERDA's bond issuance to replenish the residential Revolving Loan Fund is now the second quarter of 2013. A temporary re-allocation of funds was authorized to bridge the gap, including \$6 million from the Small Business/Not-for-Profit financing program and \$4 million from Multifamily.

NYSERDA allocated \$900,000 to New York State's electric utilities participating in On-Bill Recovery 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. Payments to the remaining utilities are pending the receipt of invoices.

GJGNY financing, a vital component of the GJGNY program, continues to expand and offer additional services to participants. Through March 31, 2013, a total of 3,103 Residential loans have been closed. These loans provided \$23.7 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 2,619 MWh and 177,796 MMBtu per year.

*Multifamily Residential.* NYSERDA's GJGNY loan servicer partnered with M&T Bank and First Niagara bank to establish and operate a pre- and post-loan validation process for GJGNY Multifamily financing. M&T Bank held a teleconference with NYSERDA to review the loan process. In addition, NYSERDA scheduled a presentation on GJGNY financing for First Niagara loan officers.

In March 2013, two new Multifamily Partners were added to the Multifamily Performance Program (MPP) partner network. An additional 13 applications were received between January 1, 2013 and March 31, 2013.

Through March 2013, five agreements have been approved for GJGNY Multifamily Financing, totaling \$1,720,470. Four additional building owners have begun the process of securing GJGNY financing for their multifamily energy efficiency projects.

*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% of the loan principal, up to \$50,000, at 0% 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 financing for small business and not-for-profit customers. Through On-Bill Recovery, small business and not-for-profit customers can receive a NYSERDA loan of up to \$50,000 at 2.5% interest to finance recommended energy efficiency improvements. Customers can then repay their loan through a charge on their utility bill.

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 March 31, 2013, 15 customer applications have been approved for Participation Loans and nine have been approved for On-Bill Recovery 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. NYSERDA staff has been invited to present two sessions to lenders at a LIPA-sponsored conference on Long Island in April. In May, staff will present the program at the SBDC annual conference. In addition, in collaboration with PUSH Buffalo, a CBO, staff will host a lender breakfast and presentation. NYSERDA staff is seeking to engage contractor assistance in marketing the program across the State.

#### **4.1.1.2 Audits**

*Single-Family Residential.* Through March 31, 2013, the Single Family Residential Program has received 45,468 free/reduced-cost home audit applications. Of the received audit applications, 42,603 have been approved. From those approved applications, 33,669 audits have been completed. Of the 15,498 completed units served through Home Performance with ENERGY STAR<sup>®</sup>, 10,173 units are associated with market rate customers and 5,325 units served are associated with assisted customers. The conversion rate from audit to energy retrofit remains strong at 35%. The average cycle time between audit completion and project completion is 110 days.

Demand for free or reduced cost audits remains strong and 78% of the audit budget has been encumbered, including both paid invoices and commitments from the audit reservation number system. It is expected that the balance of audit funds will be committed by mid-year.

An additional \$3 million in funds have been identified to allow free or reduced cost audits to remain part of the program through 2013. A focus group will be established to evaluate the impact free or reduced cost has had on the Program and to identify potential strategies for incentivizing audits beyond 2013.

GJGNY audits have lead to 8,121 GJGNY Home Performance with ENERGY STAR® project completions through March 31, 2013. The installed and pipeline projects are anticipated to save 5,383 MWh and 414,186 MMBtu annually.

*Multifamily Residential.* As of March 31, 2013, the Multifamily Program has received 213 audit applications; of these, 106 were associated with affordable housing and 107 with market-rate housing. The Multifamily Program has completed 162 audits, of which half were associated with affordable housing and half with market-rate housing. There are currently 100 projects contracted to have measures installed. Of those 100 projects, 56 are associated with affordable housing and 44 are associated with market-rate housing.

Through March 31, 2013, the MPP GJGNY audit program completed 146 audits. Forty-nine projects are under contract to have measures installed. Energy savings associated with measures installed and pipeline measures through March 31, 2013 total 12,452 MWh and 157,626 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 100kW or less and 10 employees or less. As of March 31, 2013, 1530 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 program 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.

*Workforce Development.* The Workforce Development team continues to further the goals of GJGNY: to connect individuals to certification-based training and to connect businesses with the skilled individuals that they need to advance the clean-energy economy.

NYSERDA's on-the-job training program continues to provide financial opportunities for energy efficiency and solar thermal companies seeking to hire and train new workers. Through the first quarter of 2013, the workforce team contracted with 35 businesses throughout New York State to hire 108 new technical field staff.

The Workforce team also expanded classroom training opportunities under open enrollment for the GJGNY Training, Expanding Field Certification Exam Capacity and Development of Oil/Gas Furnace Installation Technical Standards (PON 2032) and the Clean Energy On-the-Job Training (PON 2033). PON 2032 offered funding for technical training workshops. Projects funded during the reporting period include:

- The Institute for Building Technology and Safety offering a range of energy efficiency courses including Building Performance Institute (BPI) certifications and infrared thermal imaging.
- Northeast Parent and Child Society offering BPI Basic Air Sealing and Insulation training as well as Targeted Retrofit Energy Analysis Tool (TREAT) energy modeling software training.
- The New York State Weatherization Director's Association offering skill enhancement training for existing residential contractors.

The Clean Energy On-the-Job Training (PON 2033) offered funding for curriculum enhancement for New York State Registered Apprenticeship programs and third-party accredited building trades programs. Contracts have included:

- LaGuardia Community College will translate Green Professional Building Skills Training (GPRO) training into Spanish.
- The Urban League of Rochester added the Basics of Building Science to its pre-apprenticeship construction trades program.
- The Urban Green Council is now offering GPRO training to the United Association of Plumbers union.

Under the Energy Efficiency Career Pathways Training and Technical Training (PON 1817), the City University of New York (CUNY) Institute for Urban Systems is under contract to develop curriculum for small commercial energy auditing. In February, CUNY convened two stakeholder focus groups to review the draft curriculum outline and several sample training modules. CUNY's program is designed to address gaps in skills, knowledge, and understanding with respect to specific needs and requirements for working with small businesses and nonprofit organizations in the kinds of facilities they typically occupy. The curriculum will be finalized and ready for delivery in June 2013.

Under the Workforce Development Training Partnerships for Energy Efficiency (PON 1816), NYSERDA funded training providers around the state to construct lab houses for the purpose of increasing capacity for BPI field testing. Projects include:

- The Green Jobs Training Center of Long Island began construction on their proposed lab house on March 12, 2012 and plans to conduct a grand opening in spring 2013.
- Northeast Parent Child and Society of Schenectady began renovation work the first week of February and are scheduled for completion in May.
- Champlain Valley Career & Technical Education (CV-TEC), based in Plattsburgh, continues to communicate with Earth Science Engineering (ESE)/Zebra-Tech as they complete project blueprints on a pro-bono basis. ESE/Zebra-Tech has submitted the pressure house blueprints to the New York State Education Department's Office of Facilities Planning for initial review.
- Construction for the fourth field house, located at State University of New York (SUNY) Ulster, is well underway. The excavation, installation of all new windows, exterior framing for access ramp, foundation masonry repair and insulation of lower level slab for solar thermal/radiant floor heating is completed.

NYSERDA has executed on-the-job training agreements with 35 businesses seeking to hire new employees or advance incumbent workers. As of March 31, 2013, 108 people have been hired from New York State Department of Labor's (NYSDOL) One-Stop Lists, and nine incumbent workers have been advanced.

*Outreach and Marketing.* The numbers of retrofits resulting from the CBO Outreach effort steadily increased during the first quarter of 2013. As of March 31, 2013, CBOs were responsible for 1,773 audits and 368 retrofits.

The GJGNY Outreach team worked with the NYSERDA Home Performance (HP) program staff on the new EmPower/Assisted HP Program Coordination effort. This new effort allows households with incomes at or below 60% of state median (i.e., Home Energy Assistance Program (HEAP) eligible) to be served by both EmPower New York and Assisted Home Performance with ENERGY STAR® programs. Staff created guidance documents to help CBOs understand the screening process when referring customers to the proper program for services. A webinar was held to further discuss the coordination effort.

A new round of CBO site visits was initiated in March 2013. The focus of the in-person meetings was to review work to date, contract deliverables and achievement toward retrofit goals, monthly reporting, CBO use of SharePoint as a customer relationship management (CRM) system, CBO use of NYSERDA's Comprehensive Residential Information System (CRIS) data to prioritize customers, and customer tracking and follow up practices.

NYSERDA continues to provide ongoing CBO training through monthly webinars, and has updated the CBO SharePoint site to provide more streamlined ways for NYSERDA staff to provide oversight of the Outreach program.<sup>9</sup>

CBOs that are implementing Aggregation Pilots gave a presentation at the 2013 Low-Income Forum on Energy (LIFE) Regional Meetings.

In February, NYSERDA began allowing CBOs in New York City (NYC) to make direct referrals of contractors to their clients. This process is not the normal practice throughout the remainder of the State, where customers are provided a list of contractors from which to choose. NYSERDA is allowing this exception in NYC because it is viewed as a developing market for the Home Performance program, and the network of participating contractors is not very extensive in some neighborhoods. The process outlines the procedures for referring customers to a shorter list of participating Home Performance contractors and explains the accountability concerns that come with directing customers to specific contractors.<sup>10</sup> The protocol allows CBOs to select from three processes:

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<sup>9</sup> More information and assistance locating a CBO in your area can be found at <http://www.nyserda.ny.gov/mycbo>.

<sup>10</sup> Further information on the CBO Direct Referral Process can be found in the Green Jobs – Green New York Monthly Update for March 2013 located on NYSERDA's website at

- Vetted List and Contractor Profile.
- Round-Robin.
- CBO Developed Referral Process.

A new CBO locator web page replaced the geographic map on the NYSERDA site, making it easier for people to connect with their local CBO using their ZIP code. The new page has lead generating capabilities. Customers visiting the site enter their ZIP code and other information to connect with the CBO that services their area.

Staff worked with CBOs to develop several new case studies including one on the contractor/CBO relationship and one on workforce development.

The following brochures and fact sheets were produced and distributed:

- CBO “What to Expect” fact sheet - The fact sheet provides a step-by-step information on participation in the residential energy efficiency program, Home Performance with ENERGY STAR, and helps the homeowner become well-informed and confident of their next steps. The fact sheet is branded by the individual CBO.
- New CBO Workforce brochures - These brochures provide information on energy-related careers and NYSERDA’s workforce development program; they were printed in English and Spanish and have been delivered to CBOs requesting them.
- Small Business Energy Audit Fact Sheet.

*Evaluation.* NYSERDA Evaluation staff and consultants finalized the work plan to assess the GJGNY jobs impacts and continue to work with the various GJGNY programs to gather information to inform sample and instrument design. Efforts to leverage and coordinate with existing evaluation activities continue. The job impacts assessment, as planned, will deploy in a two-phased approach. Telephone survey questions are in final stages of development and are included in surveys already being conducted for ongoing evaluation efforts or are administered separately, as needed. The first survey activity for the jobs assessment will commence in April and is planned to continue through May. NYSERDA will work toward having preliminary results of the job impact assessment in late 2013, pending data collection and analysis in the near term.

In addition to the job impact assessment effort, the NYSERDA Evaluation staff and consultants continue to develop the work plans to evaluate the GJGNY Small Business/Not for Profit and CBO-related activities. The Small Business/Not for Profit evaluation, as planned, will deploy in a two-phased approach. The first phase will include surveys of program participants and lenders. The first phase of research will also include secondary research to characterize the small commercial and not-for-profit programs offered in New York and other jurisdictions. The scope of the second phase is under development and is planned to include research with non-participants to fully investigate market issues. The survey activity for this effort is planned to commence in late-May and continue through early June 2013.

The work plan to evaluate CBO-related activities is under development and will include primary research, via surveys and case studies, to understand the experiences and lessons learned and to document planned activities underway that promote energy efficiency and workforce development. Through case studies and in-depth interviews, the effort will explore various program objectives, seeking to understand the success and barriers experienced by CBOs. The survey activity for this effort is planned to commence in late May and continue through early June 2013.

#### **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 allows 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. The Residential Efficiency Services program seeks to address environmental justice issues by directly targeting outreach to environmental justice communities and by referring CBOs that address environmental justice issues to appropriate programs.

*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 March 31, 2013, RGGI funds supported 33 completed and installed energy-efficiency projects. The installed and pipeline projects are expected to save a total of 9,663 MWh and 448,144 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 renewables (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 (Int. 194-2010), 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 over 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 March 31, 2013, MCERP funds helped to offset 206,210 tons of CO<sub>2</sub> 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 March 31, 2013, 738 energy efficiency projects were completed. The installed and pipeline projects are projected to save a total of 30,874 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. 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.

The HPwES Program uses RGGI funds for cost-effective oil and propane efficiency measures, such as replacing inefficient oil and propane heating equipment and other measures that have a direct impact on reducing oil and propane consumption. Electric and gas efficiency measures are funded with EEPS funds. Through March 31, 2013, 2,231 energy efficiency projects were completed. The installed and pipeline projects are projected to save approximately 577 MWh and 81,870 MMBtu per year.

*Green Residential Building Program.* The Green Residential Building Program (GRBP)<sup>11</sup> 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 March 31, 2013, the GRBP has received a total of 402 incentive applications for 402 residential buildings; 231 of these buildings received incentives paid with RGGI funds. 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 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 2,109 MWh of electricity and 37,358 MMBtu through March 31, 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 March 31, 2013, 19 Technicians have been approved for program participation to verify GRBP building eligibility.

*Solar Thermal Incentive Program.* RGGI funds will support incentives for the installation of solar thermal systems to replace fossil-fuel domestic hot water systems. Incentives will be available for new and existing multifamily and single-family buildings. Incentives also will be fully coordinated with the MPP, HPwES, the New York ENERGY STAR<sup>®</sup> 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 109 project applications, seven of which have since been cancelled. The remaining 102 projects represent RGGI-funded incentives totaling \$842,658.

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

As of March 31, 2013, 85 of the 102 solar thermal projects had been installed. The installed and pipeline projects are anticipated to save a total of 3,035 MMBtu annually. The current PON 2149 incentive budget is more than \$860,000, all of which has been committed to Solar Thermal projects. The PON 2149 budget is an increase from the previous total of almost \$781,000 due to the addition of more than \$79,000 in funding from canceled or reduced (photovoltaic) PV projects. This funding will be used for solar thermal systems that can displace between 50% and 80% of the fossil fuels used to produce domestic hot water.

### **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 CO<sub>2</sub> 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 March 31, 2013, NYSERDA and EFC continued to initiate outreach to municipalities in order 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 Process Improvement Program**

The Industrial Process Improvement program is a longer-term initiative that will support development and demonstration of technologies with substantial greenhouse gas (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 Process Improvements, 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 of 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 by the marketing place. 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 CO<sub>2</sub> 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. Two rounds of due dates, in mid- and late- 2013, will occur.

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 System, development of energy efficient power distribution system for Data Centers, a solid state disk based energy-efficient storage system for servers, and the demonstration of performance of fisonic devices for steam customers. All four projects were contracted. The AC residential solar system project successfully demonstrated the reduced cost of a PV solar 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. These projects include electric vehicle infrastructure, vehicle components and new fuels, as well as transportation optimization systems for both roadways and airports. A new software system helps control airport surfaces and optimize aircraft movement and sequencing for increased efficiency and fuel savings. Anti-idling systems for NYC ferry boats are also under development which use mechanical linkages to replace engine drive power and will also save fuel. Six plug-in vehicles are now available in rental agencies around the New York City Metro area. A project exploring self-organizing traffic light systems is nearly complete. In this project, traffic lights can communicate to each other and dynamically adopt changes in a transportation network, reducing traffic and vehicle idling. Work also continues on a regenerative shock absorber, which will convert roadway vibration into usable electric energy for vehicles. In total, \$1.2 million out of \$1.5 million has been invoiced in the Transportation area.

## **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 March 31, 2013, the Statewide Photovoltaic Program supported the installation of 366 solar photovoltaic systems with a total capacity of approximately 3,446 kW. It is estimated these systems will produce 4,305 MWh of electricity annually.<sup>12</sup>

Recognizing the continued benefit of investing in PV in the Long Island region, an additional \$11 million was allocated to support the continuation of LIPA's Solar Pioneer program during this timeframe, and another \$3.6 million is planned to be allocated through June 2013.

### **4.3.2 Advanced Power Technology Program**

The Advanced Power Technology Program (APTP) 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.

*Advanced Renewable Energy.* The Advanced Renewable Energy component of the APTP 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 off-shore 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 has begun operation. There is also collaborative activity with the U.S. Department of Energy and new business incubators to try to advance solar technology.

Five smaller research contracts are exploring other areas of renewable energy, such as anti-reflective coatings and nano-graphene conductors for photovoltaic sources and energy storage devices. This application also includes solar thermal generation, and a commercial wind plant analyzer that will help increase the effectiveness and power output of large-scale wind turbines. A completed study has taken stock of small scale hydro sites for New York State with recommendations for further development. In total, \$1.5 of the \$1.7 million allocated to these 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 NY Bight). These studies are

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<sup>12</sup> Statewide Photovoltaic numbers decreased from the previous quarter due to the re-programming of funds.

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.

*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 the U.S. Department of Energy, 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. The project continued to work on permitting for a second characterization well to be drilled at Lamont-Doherty Earth Observatory.

### **4.3.3 Competitive Greenhouse Gas Reduction (CGGR) Pilot**

Under this 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 benefits described below:

- Provide a framework for marketplace participants to compete for funding to support large GHG reduction projects primarily on a cost-per-ton of CO<sub>2</sub> equivalent basis.
- Reduce the costs of achieving the reduction goals of the CO<sub>2</sub> budget trading program by achieving CO<sub>2</sub> 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 3,000,000 tons of CO<sub>2</sub> reductions.

## **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 first quarter of 2013, NYSERDA continued to conduct outreach activities related to the “Responding to Climate Change in New York State” (a.k.a. ClimAID<sup>13</sup>) project. A second well-attended webinar on community response and reaction to Hurricane Irene/Tropical Storm Lee was also conducted in the first quarter.

A contractor team has been selected to design, develop, implement, manage and maintain the web-based New York Climate Change Science Clearinghouse (NYCCSC). 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.

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<sup>13</sup> The full ClimAID report can be found at <http://www.nyserderda.ny.gov/climaid>

Climate-related research also continues in support of the New York State Energy Plan, and the State's Climate Action Plan.<sup>14</sup>

#### **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. To do this, 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.

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 which are otherwise available from NYSERDA programs. Project funds can be used for implementation of measures and equipment including project design and engineering costs, infrastructure investments, and for demonstrations of new and emerging technologies and approaches. Given the focus on near-term benefits, funds were not made available for research and development projects or for product development. Eligible sectors include businesses, agri-businesses, municipalities (counties, towns, cities, or villages), local development corporations, business or municipal improvement districts, public and private institutions (e.g. universities, colleges, hospitals, schools), and not-for-profits. REDGHG focuses on several end-uses including: Transportation, Manufacturing and Industrial Process, Buildings, Agriculture, Municipal process, Renewable Electric Generation, and District Energy.

Through March 31, 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. Projects are located in nine of the 10 REDC regions. The Project Managers assigned to each project are working on the contract packages and Statements of Work that will guide the proposers throughout the completion of the projects. Most contracts are expected to be executed in the 2<sup>nd</sup> and 3<sup>rd</sup> quarters of 2013.

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<sup>14</sup> For more information, see the New York State Climate Action Plan Interim Report (<http://www.dec.ny.gov/energy/80930.html>)

#### **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) development of, and updating to, 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 August 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 Council.

##### **4.4.4.2 Implementation**

The implementation component of the program was launched on June 17, 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 initiative 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) and 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), perform outreach, education, and promotion of NYSERDA program opportunities to residents, businesses, institutions and local governments across the State. Formerly the Energy Smart Communities Program, EDGE will educate New Yorkers about the role that energy efficiency and renewable power can play in reducing energy costs and providing clean, reliable energy for homes, schools and workplaces. The EDGE Program was designed to include support for Governor Andrew M. Cuomo's Regional Economic Development Council 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 Regional Councils, NYSERDA can provide a greater level of education and adoption of energy-efficiency practices at the community level. NYSERDA has contracted with the New York State Economic Development Council and Solar One whose team includes regionally based economic development organizations to provide on-the-ground outreach support. A statewide training for Regional Outreach Contractors was held. ROCs are finalizing regional outreach plans to strategically target and interact with stakeholders in their communities.

#### **4.4.5 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 Green Bank is to address financial market barriers that are impeding the flow of private capital into the clean energy sector. The 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 Green Bank. Guiding principles for 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 Green Bank is a cost-effective, powerful and complementary addition to New York's existing portfolio of clean energy support programs. It will provide unique value that current programs alone cannot deliver. The 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 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 Green Bank, those funds are not permanently expended. Instead, the funds invested by the Green Bank will be returned to the Green Bank and will be available to deploy again to achieve additional energy and environmental benefits. This recycling effect permits New York 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 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.

# Appendix A

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This appendix describes the general methods and assumptions that are used to calculate the energy savings, emission reductions, bill savings and cost-effectiveness metrics presented in the Operating Plan (Plan) for Investments in New York under the CO<sub>2</sub> Budget Trading Program and the CO<sub>2</sub> Allowance Auction Program.

## 1.1 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.

## 1.2 CO<sub>2</sub>e 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,<sup>15</sup> emissions for gases other than carbon dioxide are converted into carbon dioxide equivalent units (CO<sub>2</sub>e) through multiplication with their appropriate Intergovernmental Panel on Climate Change (IPCC) global warming potential value,<sup>16</sup> shown in Table TA - 1.

**Table A-1. Global Warming Potentials**

Gas	Global Warming Potential
Carbon dioxide (CO <sub>2</sub> )	1
Methane (CH <sub>4</sub> )	21
Nitrous Oxide (N <sub>2</sub> O)	310

NOTE: These values represent a 100-year time horizon.

Source: Intergovernmental Panel on Climate Change (IPCC) Second Assessment Report: Climate Change 1995.

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<sup>15</sup> 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.

<sup>16</sup> 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 CO<sub>2</sub>e values represent aggregate CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O 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**

	<b>Transport (lb CO<sub>2</sub>e/MMBtu)</b>	<b>Residential (lb CO<sub>2</sub>e/MMBtu)</b>	<b>Commercial (lb CO<sub>2</sub>e/MMBtu)</b>	<b>Industrial (lb CO<sub>2</sub>e/MMBtu)</b>
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	

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

An average emission factor of 826 lb CO<sub>2</sub>e/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.<sup>17</sup> While electricity savings may not lead to near-term emission reductions under the RGGI CO<sub>2</sub> cap, savings will potentially reduce imports of electricity to New York; the demand for CO<sub>2</sub> 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.

<sup>17</sup> The emission factor for electricity is based on data from Patterns & Trends- New York State Energy Profiles: 1997 – 2011 (NYSERDA, June 2011) and methodology from the GHG Inventory and Forecast prepared for the 2009 New York State Energy Plan (August 2009).

### 1.3 Bill Savings

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

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

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

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

*Visit [nyserderda.ny.gov](http://nyserderda.ny.gov) to learn more about NYSERDA programs and funding opportunities.*

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

## New York's RGGI-Funded Programs Status Report Quarter Ending March 31, 2013

September 2013

**New York State Energy Research and Development Authority**  
Richard L. Kauffman, Chairman | Francis J. Murray, Jr., President and CEO