

# THE REGIONAL GREENHOUSE GAS INITIATIVE

An Initiative of the Northeast and Mid-Atlantic States of the U.S.

## Regional Investment of RGGI CO<sub>2</sub> Allowance Proceeds, 2012

February 2014

[www.rggi.org](http://www.rggi.org)



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## Executive Summary

Investments of Regional Greenhouse Gas Initiative (RGGI) auction proceeds to date<sup>1</sup> are projected to return more than \$2 billion in lifetime energy bill savings to more than 3 million participating households and more than 12,000 businesses in the region. These programs are projected to offset the need for approximately 8.5 million megawatt hours (MWh)<sup>2</sup> of electricity generation, save more than 37 million mmBTU of fossil fuels, and avoid the release of approximately 8 million short tons of carbon dioxide (CO<sub>2</sub>) pollution into the atmosphere over their lifetime.

RGGI is making a difference for New England and Mid-Atlantic households, businesses, farms, and industry. The program has powered a \$700 million investment in the region's energy future: reducing energy bills, helping businesses become more competitive, accelerating the development of local clean and renewable energy sources, and limiting the release of harmful pollutants into the air and atmosphere, while spurring the creation of jobs in the region. An independent 2011 study by the Analysis Group reported over 16,000 new job-years are being created as a result of investments made during the first three years of the program.<sup>3</sup>

Figure 1

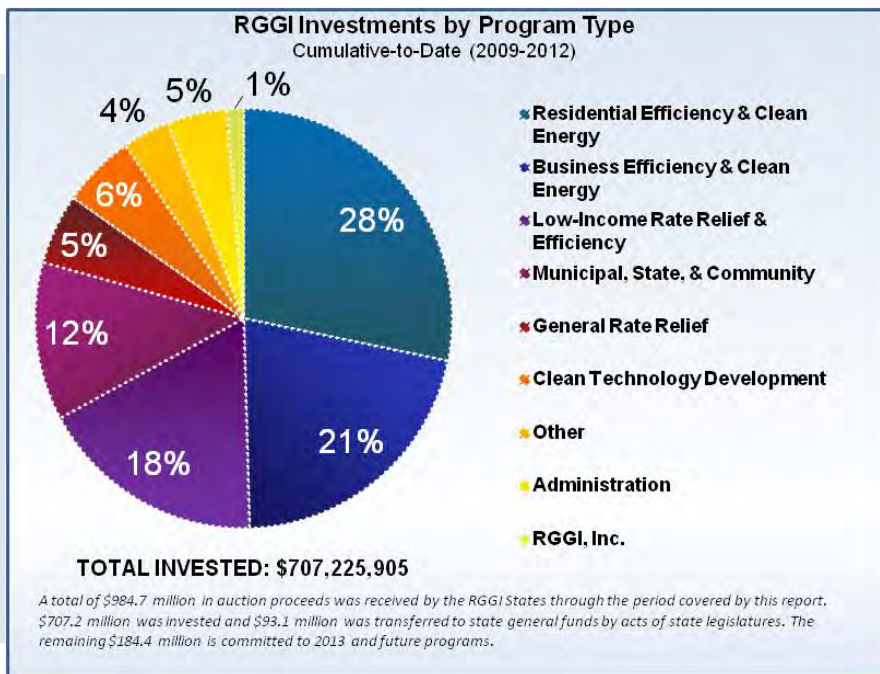
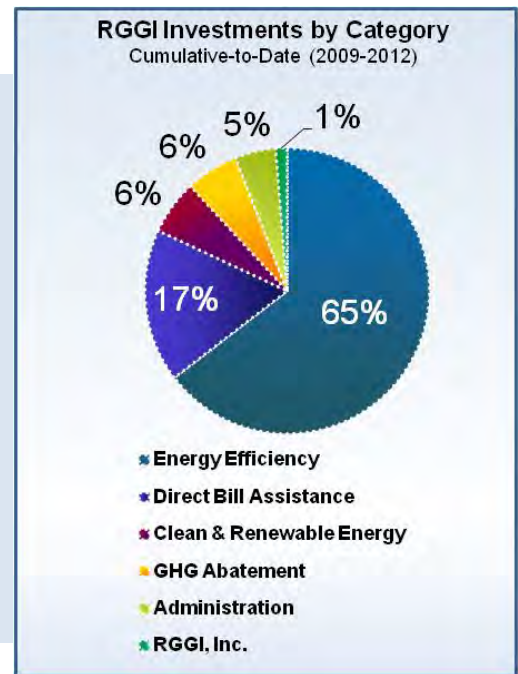


Figure 2



<sup>1</sup> "RGGI Investments" are proceeds generated by RGGI auctions that have been invested by the RGGI states in the programs discussed in this report. These investments do not include New Jersey proceeds or investments, transfers to state general funds, or funds committed to 2013 or future programs, but not yet encumbered or spent.

<sup>2</sup> For this report each RGGI state projected cumulative and lifetime benefits of RGGI investments. In compiling this data, a RGGI state identified a unit conversion error that was previously used to project avoided MWh in the *Regional Investment of RGGI CO<sub>2</sub> Allowance Proceeds, 2011* report. This error has been corrected in the regional avoided MWh and regional avoided CO<sub>2</sub> emissions in this report.

<sup>3</sup> Analysis Group. *The Economic Impacts of the Regional Greenhouse Gas Initiative*. Nov. 2011.

[http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic\\_Impact\\_RGGI\\_Report.pdf](http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf)

These investments, in concert with the broader energy policies of each RGGI state, are making the region a national leader in energy efficiency, clean and renewable energy, and greenhouse gas (GHG) emissions abatement. For example, [six RGGI states](#) were ranked among the top ten states nationwide for energy efficiency investments by the American Council for an Energy Efficient Economy in 2012.<sup>4</sup>

RGGI investments fall into four primary program categories: energy efficiency, clean and renewable energy, GHG abatement, and direct bill assistance programs.

### Energy Efficiency

More than 73 percent of 2012 RGGI investments, and approximately 65 percent of cumulative RGGI investments to date, fund energy efficiency programs in the region. Broadly, energy efficiency programs improve the way consumers use energy, allowing them to literally “do more with less energy.” For example, an energy efficient appliance allows a homeowner to enjoy the benefits of a new appliance, while using less electricity — and paying less on their electricity bill. Businesses can generate the same kind of savings through a number of measures, from basic insulation and HVAC upgrades at an office, to more efficient lighting in a store or warehouse, to industrial processes like using excess heat produced to dry and cure wood to help generate power at a wood processing plant.

**RGGI investments in Energy Efficiency are expected to return more than \$1.8 billion in lifetime energy bill savings to consumers in the region.**

#### Vermont: Efficiency Vermont



Photo Credit DRA Architects

*“Working with Efficiency Vermont allowed us to incorporate electrical and air quality upgrades along with air sealing and insulation, to create a building that the community can afford to operate well into the future.”*

*—Paul ZaBriskie, Contractor at EnergySmart of Vermont*









### Clean & Renewable Energy

More than 6 percent of 2012 RGGI investments, and more than 6 percent of cumulative RGGI investments to date, fund clean and renewable energy programs in the region. Clean and renewable energy programs accelerate the deployment of local, clean, and renewable energy technologies. Many RGGI-funded programs provide grants or low-interest financing to businesses and homeowners seeking to install on-site renewable or clean energy systems (e.g. rooftop solar panels, farm-based wind turbines, or fuel-cell systems). These programs allow participants to minimize up-front expenses and use the savings generated by the installed measure each month to pay for the system.

**RGGI investments in Clean and Renewable Energy are expected to return more than \$73 million in lifetime energy bill savings to consumers in the region.**

<sup>4</sup> American Council for an Energy-Efficient Economy, *The 2012 State Energy Efficiency Scorecard*, Oct. 2012. <http://www.aceee.org/research-report/e12c>

**Table 1: All Programs Funded by RGGI**

 <p><b>Participating Households</b> To-Date: 3.2 million</p>	 <p><b>Energy Bill Savings</b> To-Date: \$240 million Lifetime: \$2 billion</p>	 <p><b>CO<sub>2</sub> Emissions Avoided</b> To-Date: 792,000 short tons Lifetime: 8 million short tons</p>
 <p><b>Participating Businesses</b> To-Date: 12,000</p>	 <p><b>Megawatt Hours Saved</b> To-Date: 928,000 Lifetime: 8.5 million</p>	 <p><b>Equiv. Cars Taken Off the Road</b> To-Date: 149,000 Lifetime: 1.4 million</p>
 <p><b>Workers Trained</b> To-Date: 3,600</p>	 <p><b>Million BTU Saved</b> To-Date: 2.5 million Lifetime: 37 million</p>	

**Connecticut: Connecticut Clean Energy Finance and Investment Authority (CEFIA)**



*“This project, which is expected to generate roughly half of the electricity needs of two schools, is not only an important ecological step but will generate significant savings for Cromwell’s taxpayers.”*

*— Cromwell’s former first selectman, John Flanders*

**GHG Abatement**

More than 4 percent of 2012 RGGI investments, and approximately 6 percent of cumulative RGGI investments to date, fund GHG abatement programs in the region. GHG abatement programs promote the research and development of advanced energy technologies, the reduction of vehicle miles traveled, and the reduction of GHG emissions in multiple sectors. These programs typically identify and target local needs and opportunities, such as: fuel-cell-powered municipal buses; grants for industrial process improvements that reduce emissions from local industry; and forestry projects that enhance wildlife habitats while increasing carbon sequestration.

**RGGI investments in GHG Abatement are expected to avoid the release of 260,000 short tons of harmful CO<sub>2</sub> pollution into the atmosphere.**

**Direct Bill Assistance**

More than 9 percent of 2012 RGGI investments, and more than 17 percent of cumulative RGGI investments to date, fund direct bill assistance programs in the region. Direct bill assistance programs provide rate relief to electricity consumers in the RGGI region. Many programs provide specific assistance to low-income families and qualifying small businesses, while other programs provide small on-bill credits to all consumers. Direct bill assistance typically appears as a credit on a consumer’s electricity bill.

**RGGI investments in Direct Bill Assistance have returned more than \$122 million in bill credits to more than 2 million participating households.**

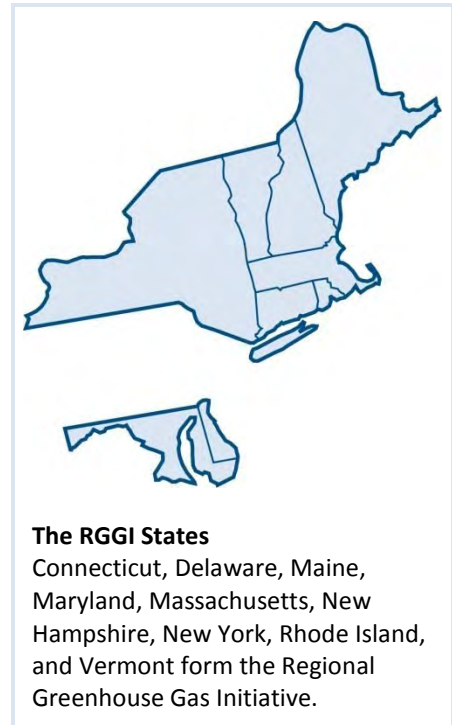
## Introduction

### The Regional Greenhouse Gas Initiative

RGGI is the nation's first mandatory GHG pollution reduction program for power sector CO<sub>2</sub> emissions. Composed of individual CO<sub>2</sub> budget trading programs in each RGGI state, the program creates a regional market for the purchase and sale of CO<sub>2</sub> allowances, each of which permits a power plant to emit one short ton of CO<sub>2</sub>. Through independent regulations, based on the RGGI Model Rule, each state limits emissions of CO<sub>2</sub> from electric power plants to a pre-defined cap, issues CO<sub>2</sub> allowances, and establishes participation in regional CO<sub>2</sub> allowance auctions.

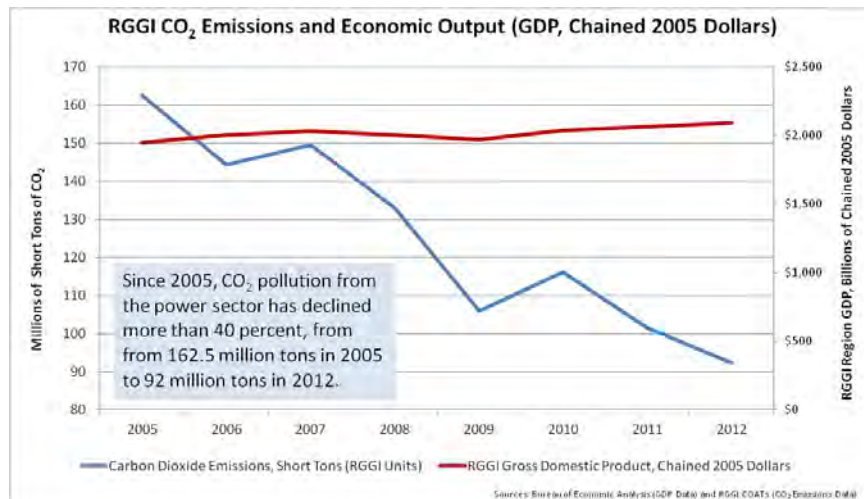
From September of 2008 to December of 2013, more than 650 million CO<sub>2</sub> allowances were sold at auction by the RGGI states through quarterly regional allowance auctions administered by RGGI, Inc. Over this period, the RGGI states held 22 auctions, with first control period allowances selling at a weighted average price of \$2.31, with prices ranging from \$3.51 to \$1.86 and second control period allowance prices ranging from \$3.21 to \$1.86 and selling at a weighted average price of \$2.52. The first control period ran from January 1, 2009 to December 31, 2011 and the second control period runs from January 1, 2012 to December 31, 2014.

Figure 3



The RGGI states have witnessed a significant reduction in power sector CO<sub>2</sub> pollution, even as the regional economy has continued to grow, as shown in Figure 3.

Figure 3



Average 2012 CO<sub>2</sub> emissions from RGGI regulated power plants were more than 40 percent lower than emissions in 2005. A [2010 analysis](#) by the New York State Energy Research and Development Authority (NYSERDA) found that a number of factors contributed to the then

observable drop in emissions, with energy efficiency accounting for nearly 12 percent of emissions reductions.

97 percent of power plants under the RGGI program achieved compliance during the first three-year control period.

## This Report

This report is designed to provide information to the public regarding the use of funds generated by the sale of CO<sub>2</sub> allowances through RGGI CO<sub>2</sub> allowance auctions for the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. This report does not contain data on New Jersey's RGGI auction proceed expenditures or investments. The investment of RGGI program proceeds is wholly at the discretion of the states participating in the program and all investment programs are independently administered and operated by the states.

**Table 2: Reporting-Year Basis and Cumulative Proceeds by State**

State	Reporting Basis	Cumulative Auction Proceeds Received through 2012 Reporting Period
Connecticut	Calendar Year	\$65,167,703
Delaware	Calendar Year	\$29,690,897
Maine	Calendar Year	\$34,246,622
Maryland	Fiscal Year	\$197,434,494
Massachusetts	Calendar Year	\$178,921,781
New Hampshire	Calendar Year	\$42,452,629
New York	Calendar Year	\$410,586,620
Rhode Island	Calendar Year	\$17,977,845
Vermont	Calendar Year	\$8,284,461
<b>Total 9-State RGGI Region</b>		<b>\$984,763,052</b>

Each program receiving RGGI funds is unique, and is designed by the state to specifically address the state's policy objectives, needs, and circumstances. As a result, the data collected and compiled regarding these programs is varied, and based on specific program objectives. For example, a program designed to encourage

**Table 3: RGGI Auction Proceeds and Investments**

Description	Funds
Total Auction Proceeds through Dec. 31, 2012	\$1,119,788,759
- New Jersey Proceeds	\$113,344,551
- Adjustment for Fiscal Reporting Basis (MD)	\$21,681,155
- Transfers to General Funds	\$93,100,000
- Funds Committed to 2013 and Future Programs	\$184,437,147
<b>Cumulative RGGI Investments to Date</b>	<b>\$707,225,905</b>

homeowners to use compact fluorescent light bulbs through discounts on the bulbs at local grocery stores operates much differently than a competitive-bid industrial program which provides grants and low-interest financing to factories installing a range of measures from solar panels to variable-speed motors. The data collected and recorded regarding these programs are, therefore, necessarily different and are calculated using different methods.

As a result of these and other differences, the data presented in this report is compiled using the output of state- and program-based calculated estimates of actual and projected energy savings and benefits. While significant analysis is conducted to produce estimates in each program, the

methods used in these analyses may vary across programs and states. In addition, states report data on different time schedules, with one state reporting program data on a fiscal-year basis (July 1 – June 30) and others reporting on a calendar-year basis (January 1 – December 31) (see Table 2).

Data presented in each category (e.g. “Participating Households”, or “MWh Saved”) generally follows the definitions provided in the Appendix of this document. Variations within these reporting guidelines are generally discussed in each definition. Footnotes throughout the report provide clarity on specific variations.



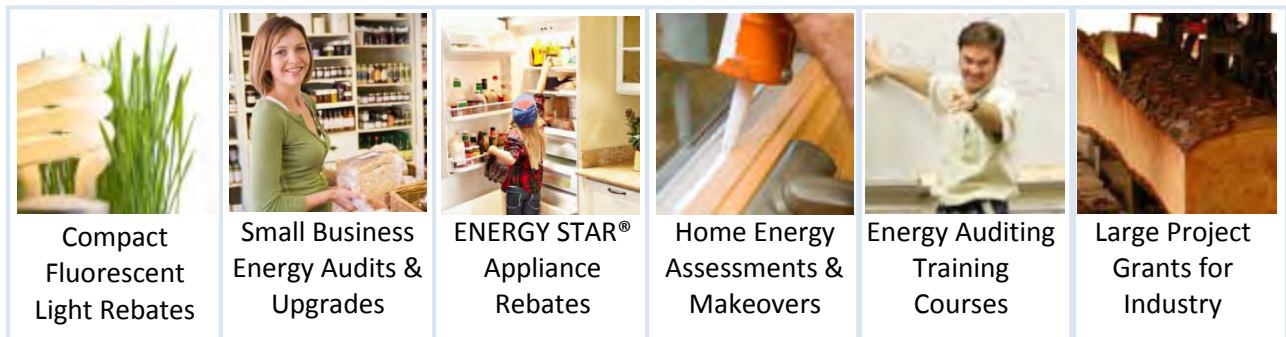
## RGGI Investments

### Energy Efficiency

More than 73 percent of 2012 RGGI investments, and approximately 65 percent of cumulative RGGI investments to date, fund energy efficiency programs in the region. These investments are projected to save the programs' 800,000 household participants and 12,000 business participants more than \$1.8 billion on their energy bills over the lifetime of the installed measures. These efficiency measures are also projected to avoid the release of more than 7 million short tons of CO<sub>2</sub> pollution into the atmosphere over their lifetime, the equivalent of taking more than 1.3 million cars off the road for a year.









Broadly, energy efficiency programs improve the way consumers use energy, allowing them to literally “do more with less energy.” For example, an energy efficient appliance allows a homeowner to enjoy the benefits of a new appliance, while using less electricity — and paying less on their electricity bill. Businesses can generate the same kind of savings through a number of measures, from basic insulation and HVAC upgrades at an office, to more efficient lighting in a store or warehouse, to industrial processes like using excess heat produced to dry and cure wood to help generate power at a wood processing plant.

**Figure 4** Energy Efficiency Programs Funded by RGGI



Energy efficiency programs receiving RGGI funding span the gamut — from the [Delaware Weatherization Assistance Program](#) for low-income households, to [Efficiency Maine's Business Incentive Program](#) for businesses of all sizes, to the Massachusetts [Green Communities](#) initiative for cities and towns.

**Table 4: Energy Efficiency Programs Funded by RGGI**

	<b>Participating Households</b> To-Date: 815,000		<b>Energy Bill Savings</b> To-Date: \$111 million Lifetime: \$1.8 billion		<b>CO<sub>2</sub> Emissions Avoided</b> To-Date: 742,000 short tons Lifetime: 7.1 million short tons
	<b>Participating Businesses</b> To-Date: 12,000		<b>Megawatt Hours Saved</b> To-Date: 897,000 Lifetime: 8 million		<b>Equiv. Cars Taken Off the Road</b> To-Date: 140,000 Lifetime: 1.3 million
	<b>Workers Trained</b> To-Date: 3,600		<b>Million BTU Saved</b> To-Date: 2.5 million Lifetime: 37 million		

Ultimately, all electricity consumers, not only those who make upgrades, benefit from energy efficiency programs. Lower overall demand for electricity results in lower wholesale electricity rates — as power plants with the highest costs do not run as often and expensive transmission upgrades can, in some cases, be deferred.

Lowered energy costs create numerous benefits across the economy as families are able to invest savings in other priorities and businesses are able to grow. Thousands of jobs are estimated to have been sustained through increased business competitiveness across the region<sup>5</sup>. Home retrofit programs, in particular, spur significant local employment gains in the housing and construction sector.<sup>6</sup>

RGGI funds contribute to broad investments in energy efficiency made by the RGGI states with funding drawn from private investment, foundations, system benefit charges, federal grants, and corporate contributions. As a result, six RGGI states were ranked among the [top ten states nationwide](#) for energy efficiency investments by the American Council for an Energy Efficient Economy in 2012.

### Success Story: In Vermont, RGGI Supports Ultra-Efficient Habitat for Humanity Passive House

Since buildings are one of the largest sources of CO<sub>2</sub> emissions that are contributing to climate change, Vermont's Comprehensive Energy Plan has committed to reaching a goal of 30 percent of new homes built to net-zero design standards by 2020. So when Green Mountain Habitat for Humanity secured a building lot in Northern Vermont, it partnered with Efficiency Vermont, High Meadows Fund, and Preferred Building Systems to build the first Habitat for Humanity home in the United States to meet the Passive House standard. This ultra-efficient Passive House works toward meeting this statewide goal while reducing long term living expenses by minimizing heating and cooling costs.

Passive Houses are built on the premise that they maintain temperature using insulation rather than by using energy (think Thermos® rather than hot plate). These homes use about one sixth of the energy use of a comparable home built to the state energy code. In addition, these homes offer superior indoor air quality, occupant comfort, and more durable construction details.

While Passive Houses are very cost-effective over time, they cost more to build than standard homes built to code. Funds from RGGI incentivized the design and building of this Passive House to offset the initial expense of this home to provide long term comfort, affordability, and a reduction in GHG emissions.



<sup>5</sup> Analysis Group. *The Economic Impacts of the Regional Greenhouse Gas Initiative*. Nov. 2011. [http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic\\_Impact\\_RGGI\\_Report.pdf](http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf)

<sup>6</sup> Ibid.

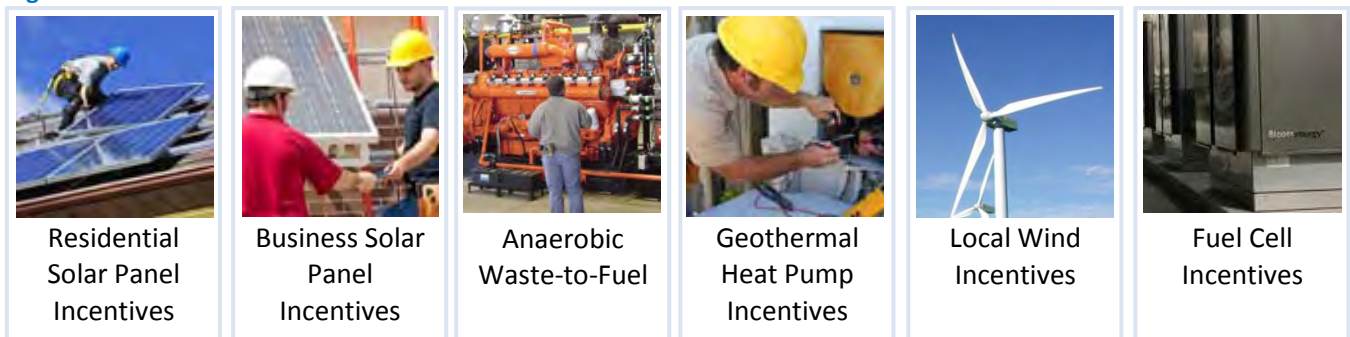
## Clean & Renewable Energy

More than 6 percent of 2012 RGGI investments, and more than 6 percent of cumulative RGGI investments to date, fund clean and renewable energy programs in the region. These investments are projected to enable these programs' 3,600 household participants to offset more than \$73 million in electricity expenses over the lifetime of the installed measures. These clean and renewable energy measures are projected to avoid the release of more than 390,000 short tons of CO<sub>2</sub> pollution into the atmosphere over their lifetime, the equivalent of taking more than 73,000 cars off the road.

Clean and renewable energy programs accelerate the deployment of local, clean, and renewable energy technologies across the region. Many RGGI-funded programs provide grants or low-interest financing to businesses and homeowners seeking to install on-site renewable or clean energy systems (e.g. rooftop solar panels, farm-based wind turbines, or fuel-cell systems). These programs allow participants to minimize up-front expenses and use the monthly savings generated by the installed measure to pay for the system.







Clean & Renewable Energy Programs Funded by RGGI

Figure 5



RGGI-funded clean and renewable energy programs include the Connecticut CEFIA Solar Incentive Program, the New York Advanced Renewable Energy Program, and the Delaware Dover SUNPark Program.

Table 5: Clean & Renewable Energy Programs Funded by RGGI

	<b>Participating Households</b> To-Date: 3,600		<b>Million BTU Avoided</b> To-Date: 4,200 Lifetime: 73,000		<b>CO<sub>2</sub> Emissions Avoided</b> To-Date: 23,000 short tons Lifetime: 390,000 short tons
	<b>Megawatt Hours Avoided</b> To-Date: 31,000 Lifetime: 500,000		<b>Energy Bill Savings</b> To-Date: \$5.8 million Lifetime: \$73 million		<b>Equiv. Cars Taken Off the Road</b> To-Date: 4,400 Lifetime: 73,000

Clean and renewable energy programs stimulate local economic activity by requiring installed components to be manufactured in the state, and/or to be installed by local approved contractors. Both of these activities create jobs at the same time as they save homeowners and businesses money that can be re-invested in other areas.

Just like energy efficiency, “behind-the-meter” programs also contribute to lowering wholesale electricity prices by effectively lowering the demand for electricity at the wholesale level. As demand for electricity decreases, the most expensive power plants run less often, driving prices down for all consumers in the long run.

At the same time as they reduce costs, these programs provide significant environmental benefits by offsetting fossil-fueled generation and supporting energy independence. Not only does this directly reduce emissions created by existing plants, it also defers the need to build additional fossil-fueled plants and transmission lines.

RGGI proceeds represent only a small portion of the overall investment in clean and renewable energy in the region. When coupled with renewable portfolio standards and other clean energy programs, RGGI proceeds investments are driving increases in wind and solar electricity generation.

### Success Story: New York RGGI Funds Help Clean-Energy Companies Attract Investment

RGGI funding supports Green Capital Empire (GCE), a project that helps early-stage clean energy and energy-efficiency companies in New York State attract private investment so they can commercialize products that help decrease GHG emissions. In October 2012, Green Capital Empire launched the New York Green Tech 50, a list of top private cleantech companies, and promoted the list to the investor community. Since then, 11 of the 50 have succeeded in raising capital. Among them are the following:

- Sweetwater Energy raised \$3.1 million to commercialize a process that uses renewable, non-food plant materials to produce low-cost, concentrated sugars for use in biofuels and biochemicals. The company’s plant-based process significantly reduces GHG emissions compared to petroleum-based sugar-production technologies.
- Urban Electric Power raised \$2.17 million to commercialize advanced rechargeable zinc anode battery technology using environmentally sustainable materials. Among other applications, this technology integrates renewable energy into the electric grid, helping avoid GHG emissions by increasing the practicality of renewable technologies.
- Vnomics raised \$2.5 million to commercialize products that improve fuel efficiency to help trucking fleet owners and managers operate more economical and cleaner fleets.
- WATT Fuel Cell raised \$1.8 million to develop solid oxide fuel cell systems that will operate on renewable and other fuels, providing efficient, environmentally responsible energy solutions for the portable power and distributed-generation energy markets.

Support for efforts like Green Capital Empire are part of New York State’s strategic approach to use RGGI funds to bring to market advanced energy-efficient and renewable technologies with a long-term benefit to the environment.



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## GHG Abatement

More than 4 percent of 2012 RGGI investments, and approximately 6 percent of cumulative RGGI investments to date, fund GHG abatement programs in the region. Over their lifetime these investments are projected to avoid the release of more than 260,000 short tons of CO<sub>2</sub> pollution into the atmosphere, the equivalent of taking more than 49,000 cars off the road for a year. The measures are also projected to help these programs' more than 30,000 participants avoid more than \$5 million in electricity expenses over the programs' lifetime.

GHG abatement programs promote the research and development of advanced energy technologies, the reduction of vehicle miles traveled, and the reduction of GHG emissions in multiple sectors. These programs typically identify and target local needs and opportunities, such as: fuel-cell-powered municipal buses; grants for industrial process improvements that reduce emissions from local industry; and forestry projects that enhance wildlife habitats while increasing carbon sequestration. Programs are designed to support and align with state climate plans and objectives. Each program is designed to select and support specific projects that will significantly reduce GHG emissions.

GHG Abatement Funded by RGGI

Figure 6

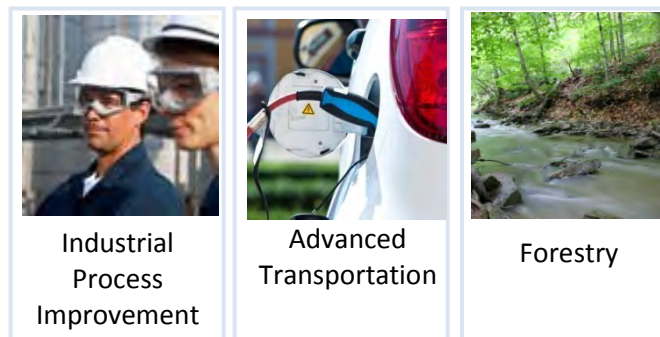








Table 7: Greenhouse Gas Abatement Programs Funded by RGGI

	<b>Participating Households</b> To-Date: 30,000		<b>Megawatt Hours Saved</b> To-Date: 60 Lifetime: 535		<b>CO<sub>2</sub> Emissions Avoided</b> To-Date: 26,000 short tons Lifetime: 260,000 short tons
	<b>Energy Bill Savings</b> To-Date: \$742,000 Lifetime: \$5.3 million		<b>Million BTU Saved</b> To-Date: 21,000 Lifetime: 171,000		<b>Equiv. Cars Taken Off the Road</b> To-Date: 5,000 Lifetime: 49,000

GHG abatement programs vary in the types of economic benefit they provide. Many competitive projects reduce electricity and fossil fuel use as part of their efforts to reduce overall emissions. Certain programs generate economic benefits similar to those realized through energy efficiency and clean and renewable energy programs.

GHG abatement projects are generally optimized to reduce emissions, which may actually increase electricity use at a facility if it is determined that this energy source is less carbon-intensive than the current alternative (e.g. oil or propane) for certain industrial or HVAC processes.

## Direct Bill Assistance

More than 9 percent of 2012 RGGI investments, and more than 17 percent of cumulative RGGI investments to date, fund direct bill assistance programs in the region. These investments have directly reduced these programs' more than 2 million recipients' energy bills by \$122 million, an average of more than \$50 for each recipient.

Direct bill assistance programs provide rate relief to electricity consumers in the RGGI region. Many programs provide specific assistance to low-income families and qualifying small businesses, while other programs provide small on-bill credits to all consumers. Direct bill assistance typically appears as a credit on a consumer's electricity bill.

Direct bill assistance programs can provide an important resource to families struggling to afford rising fuel costs during the winter months. Particularly in the northern states, consumers reliant on fuel oil for heat are significantly affected by fluctuations in fuel oil prices from year to year, a challenge that is only exacerbated for individuals and seniors living on a fixed income.

Direct bill assistance programs support economic activity by providing funds directly to consumers who can then spend those funds on other priorities. As they only provide benefits for the length of the bill-assistance program, and do not provide the ongoing benefits associated with energy efficiency improvements or renewable energy installations, bill-assistance programs have significantly lower lifetime economic benefit than other programs. They also do not lower or affect wholesale electricity prices.

Direct bill assistance programs are not designed to provide environmental benefits, as they do not directly reduce or offset fossil-fueled electricity use.

RGGI proceeds provide only a small percentage of low-income direct bill assistance programs across the states. Other sources of funds come from on-bill system benefit charges and federal funds, in the case of LIHEAP programs.

**Table 6: Direct Bill Assistance Programs Funded by RGGI**



**Participating Households**

To-Date: 2.3 million



**Energy Bill Savings**

To-Date: \$122 million

## RGGI States



### Connecticut

Connecticut invests 69.5 percent of its RGGI proceeds in energy efficiency programs, including programs administered by the [Connecticut Energy Efficiency Fund \(CEEF\)](#) (which receives more than 65 percent of the state's RGGI proceeds), and by the [Connecticut Municipal Energy Cooperative \(CMEEC\)](#) (which receives about 4 percent of proceeds).

CEEF's energy efficiency programs provide services and incentives for Connecticut homes and businesses to lower their energy bills. These programs range from the [Home Energy Solutions](#) program, which provides households with energy audits, to its [Energy Opportunities](#) program, which funds large commercial and industrial efficiency projects. Through the investment of RGGI proceeds and additional ratepayer funds, these CEEF programs reached more than 31,000 homes and over 4,500 businesses in 2012. The energy efficiency measures installed in 2012, as a result of these programs, are expected to deliver nearly \$500 million in lifetime savings and avoid more than 150,000 short tons of CO<sub>2</sub> annually.

Through the Connecticut Municipal Electric Energy Cooperative (CMEEC), Member Electric Utilities (MEU) deliver a complete portfolio of energy efficiency and renewable energy programs. In 2012, these efforts centered on the flagship Home Energy Savings program, which provides whole-house retrofit services with a number of consumer incentives to residential and limited income customers. The MEUs serviced more than 2,296 homes or residential units in 2012.

In addition to these energy efficiency investments, another 23 percent of Connecticut's RGGI proceeds have been invested in renewable energy programs supported by the [Connecticut Clean Energy Finance and Investment Authority \(CEFIA\)](#). CEFIA was established in 2011 as the nation's first "Green Bank," designed to provide low-cost financing to clean energy and energy efficiency projects. CEFIA leverages public funds, including RGGI proceeds, to attract private investment in clean and renewable resources in the state.

Figure 7

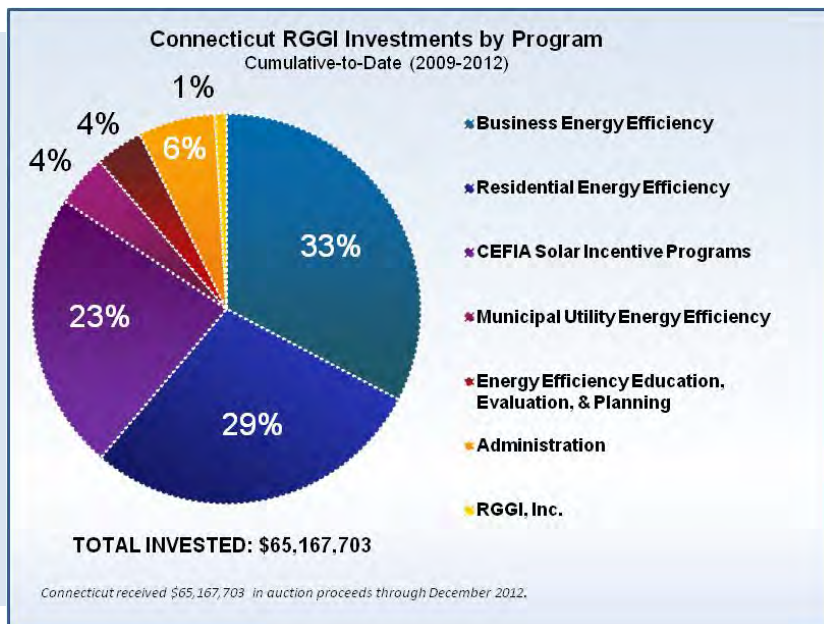
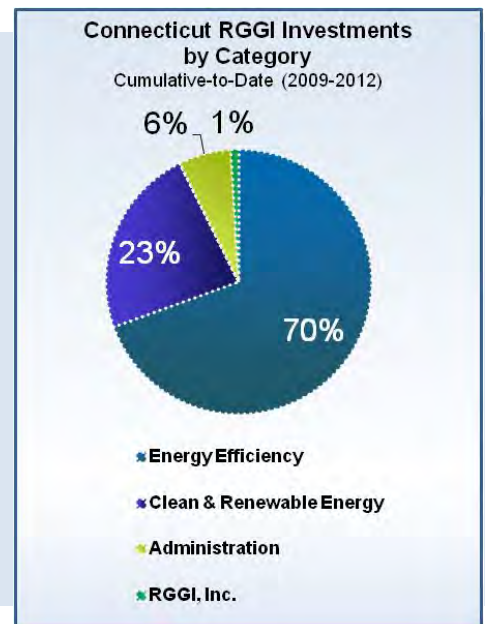


Figure 8



CEFIA's investment of 2012 proceeds resulted in the development of 51 solar photovoltaic (PV) and three (3) fuel cell installations in commercial, municipal, non-profit, and educational settings and the installation of 328 residential solar PV systems. Together these installations are projected to avoid the emission of approximately 74,300 short tons of CO<sub>2</sub> over their lifetimes.

Together, the CEEF, CMEEC, and CEFIA programs have attracted recognition from the American Council for an Energy Efficient Economy, which ranked Connecticut [sixth in the nation](#) on its 2012 State Energy Efficiency Scorecard. Information about CEEF and CEFIA programs is now available on [www.energizect.com](http://www.energizect.com), a website launched in 2013 to provide homeowners and renters, small and large businesses, and state and local governments with a portal to access the information they need to use energy more efficiently and build a clean energy future for everyone in the state.

### **Program Highlight: Business Energy Solutions**

Also partially funded by RGGI, Connecticut's Business Energy Solutions program helps businesses, municipalities, and non-profit organizations invest in energy efficiency measures (beyond lighting projects) that provide substantial energy savings and value. In 2012, the [Small Business Energy Advantage Program](#), new construction/equipment programs like the Energy Conscious Blueprint, and several programs focusing on facility lifecycle and the behavior of facility owners/operators reached more than 4,500 businesses, reducing projected CO<sub>2</sub> emissions by more than 107,000 short tons and saving a projected 185.5 million kilowatt hours (kWh) and \$25.9 million annually.

### **Success Story: Cromwell Elementary and Middle Schools Now Powered By the Sun**

Thanks in part to an investment from the Connecticut Clean Energy Finance Investment Authority (CEFIA), the town of Cromwell has installed over 300 kilowatts (kW) of photovoltaic (PV) solar capacity at its elementary and middle schools — a 181 kW system at Edna C. Stevens Elementary School and a 166 kW system at Cromwell Middle School. The town of Cromwell used a CEFIA grant of \$850,000, partially funded by RGGI proceeds, to pay for the \$1,882,061 required to purchase and install the PV solar systems.

Installed by Silktown Roofing, based in nearby Manchester, Connecticut, the two PV solar systems are projected to generate 375,000 kWh of electricity a year, meeting half of the two schools' electricity needs. The PV solar systems will help lower the schools' annual electricity bills by an estimated \$60,000 — while also helping avoid the emission of 124 projected short tons of CO<sub>2</sub> emissions per year. In addition, teachers at the school are using online monitors that track the PV solar systems' energy production and thirty solar panel lab kits donated by the solar panel building committee to integrate real world solar generation into the school's science curriculum.

"This project, which is expected to generate roughly half of the electricity needs of two schools, is not only an important ecological step but will generate significant savings for Cromwell's taxpayers," says Cromwell's former first selectman, John Flanders.

"We are very grateful for the support and funding of the Clean Energy Finance and Investment authority, supplementing the money raised in our 2008 bond issue."



Photo Credit DRA Architects

### **Resources**

[Connecticut Energy Efficiency Fund 2012 Report](#)

[EnergizeCT](#)

[Connecticut Clean Energy Finance and Investment Authority \(CEFIA\)](#)





## Delaware

Delaware has invested the majority of its CO<sub>2</sub> allowance proceeds in energy efficiency and renewable energy programs administered by the [Sustainable Energy Utility \(SEU\)](#). The SEU is a nonprofit organization created to help Delawareans and Delaware businesses save money through clean energy and energy efficiency.

SEU programs include incentives for energy efficient new construction through their Green 4 Green Program, energy efficient measures for existing construction, consumer [rebates](#) for ENERGY STAR<sup>®</sup> approved appliances; and subsidized energy auditing and rebates for whole-house energy saving retrofits through the Home Performance with ENERGY STAR<sup>®</sup> program. In 2012, the SEU also sponsored a LED lighting pilot program for 26 poultry farms — a major agriculture sector throughout the state. SEU estimates that the installation of these LED bulbs will provide Delaware poultry farmers with approximately 890 MWh of projected annual electricity savings.

Delaware has invested approximately 21 percent of its cumulative-to-date investments in low-income home weatherization and low-income heating assistance, implemented by the [Delaware Division of Energy and Climate](#) housed in the [Department of Natural Resources and Environmental Control \(DNREC\)](#). DNREC also administers a GHG reduction grant program which supports a variety of emission reduction projects with businesses, schools, non-profits, and local governments across the state.

Delaware is also investing funds to further develop its climate policy and program capabilities in its [Division of Energy and Climate](#). The Division works on a variety of climate change mitigation, adaptation, and land use related projects and policies. Recently, the Division completed Delaware specific climate projections and an impact assessment, which will help direct future climate decisions throughout the state.

Figure 9

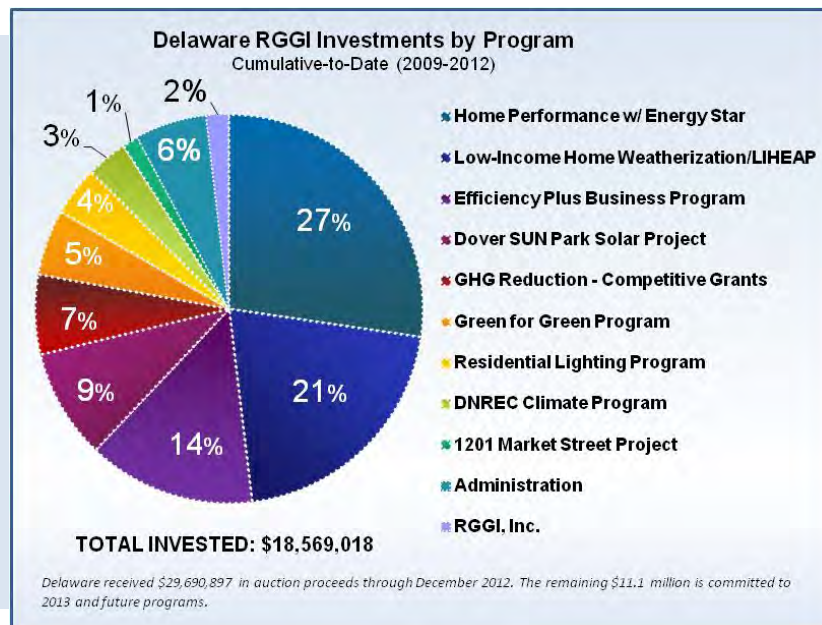
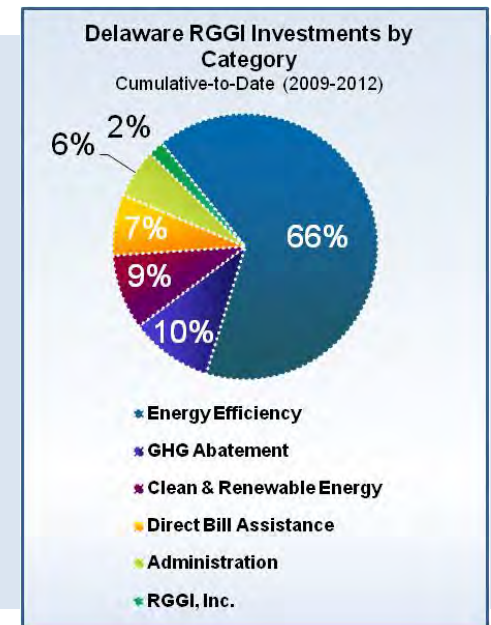


Figure 10



## Program Highlight: The Delaware Weatherization Assistance Program

The [Delaware Weatherization Assistance Program](#) (WAP) is dedicated to assisting low income Delawareans reduce energy costs and increase comfort and safety in their homes through energy efficiency measures. Ensuring the health and safety of WAP clients is also a major part of the Program. The RGGI proceeds are integral to Delaware's Weatherization Assistance Program by providing direct resources for increasing residential energy efficiency across the State, reducing the carbon footprint of Delaware's housing stock, and ensuring that homes in Delaware are safe and affordable. The RGGI proceeds have allowed 104 homes in Delaware to be weatherized since 2010.

### Success Story: Delaware Builds State's First Utility-Scale Solar PV Facility with RGGI

The Dover SUNPark is Delaware's first utility-scale photovoltaic (PV) facility. The PV facility is located on 103 acres in Dover, Delaware and has a nameplate capacity of 10 MW. The SUNPark creates enough energy to power 1,500 Delaware homes. The construction of the Dover SUNPark employed 42 people a week over a 30 week construction project schedule, with the majority of jobs being filled by local Delawareans. The project uses state-of-the-art SunPower E20 solar panels, one of the most efficient panels on the market today. To further increase the efficiency of the project SunPower tracker technology was also installed on each of the panels. SunPower tracker technology allows the panels to follow the sun's movement, thereby increasing sunlight captured by 25 percent.

The Sustainable Energy Utility (SEU) played a critical role in helping Dover SUNPark secure the financing it needed for construction. In return for SEU investing \$1.7 million of the state's RGGI CO<sub>2</sub> allowance proceeds in Dover SUNPark, the SEU will secure the first two years of Solar Renewable Energy Certificates (SRECs) generated by the facility. An SREC is generated for every MWh of electricity generated by a PV facility. SRECs can be used by utilities in Delaware to comply with the state's Renewable Portfolio Standard, which requires that utilities source a certain percentage of their electricity from solar power projects. By agreeing to purchase the Dover SUNPark's SRECs upfront, and then selling them to utilities in Delaware over time, the SEU helped the facility secure the financing it needed to be built, yet will be able to reinvest funds from the future sale of these SRECs in other Delaware clean energy projects.

"The construction of the Dover SUNPark marked a milestone in the development of the Delaware solar power industry, from 2 MW of total in-state capacity when the Dover SUNPark was first proposed to 50 MW of total capacity today. RGGI funds and the project's innovative financing will serve to reduce projected CO<sub>2</sub> emissions by 8,000 tons a year for a generation to come," said Collin O'Mara, Secretary of the Delaware Department of Natural Resources and Environmental Control.



Photo Credit Joanna Wilson, DNREC

## Resources

[Energize Delaware](#)

[Delaware's Green Energy Program](#)

[Delaware's Weatherization Assistance Program](#)

[Delaware State Regulations](#)



## Maine

Efficiency Maine is the independent, third-party administrator for all programs in Maine that help to promote all-fuels energy efficiency for Maine residents and businesses. In aggregate, 2012 investments in electric efficiency programs are projected to conserve 1.85 billion kWh of electric consumption and lower projected present and future electric costs in Maine by more than \$128 million. 2012 programs funded by RGGI include a highly-successful retail lighting and appliance rebate program and industrial and large commercial competitive bid programs that are helping Maine businesses sustain jobs and stay competitive. Most Efficiency Maine programs are funded by a combination of system benefit charges and RGGI proceeds.

Figure 11

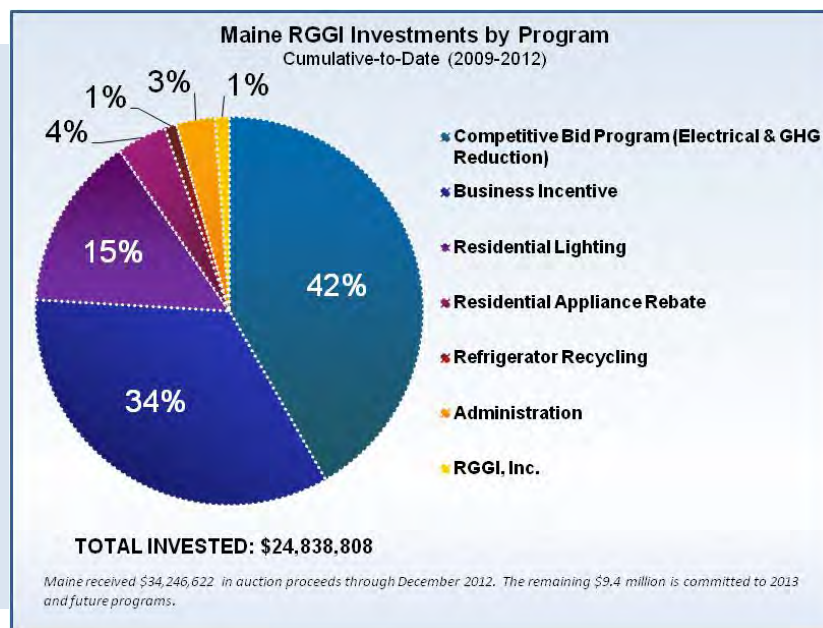
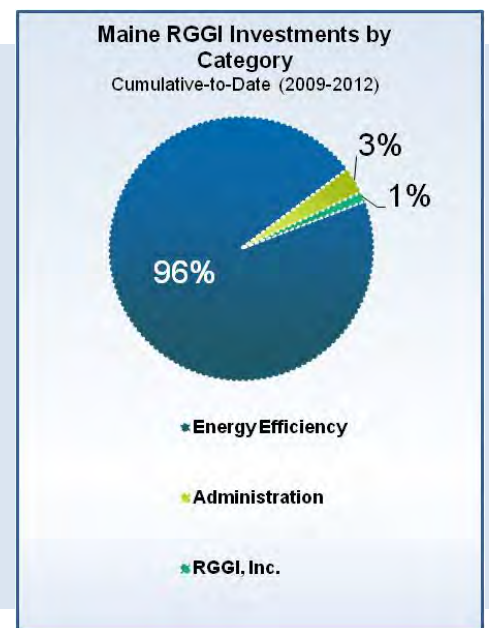


Figure 12



### Program Highlight: Business Incentive Program

Partially funded by RGGI, Efficiency Maine's Business Incentive Program provides education, technical assistance, quality control, and financial incentives for energy upgrades to businesses of all sizes. The prescriptive program provides rebates for a published list of the most common efficient electric equipment that can be used in nearly every business: lighting, lighting controls, refrigeration, HVAC units, variable speed drives, compressors, pumps, and equipment related to the agricultural industry. Efficiency Maine's custom program also provides incentives as well as technical assistance for the purchase and installation of premium-efficiency electrical equipment specific to a site's use and needs. Custom program incentives may be used for new construction projects, renovation projects, or for the replacement of functioning, but less efficient, equipment.

In 2012, more than 2,500 Maine businesses participated in the program — which will save a collective \$44.2 million in projected energy costs and 529,753 projected MWh over the lifetime of the measures.

## Success Story: A More Efficient Cold Storage System at Wyman's of Maine

Wyman's of Maine is a family-owned company with expertise in growing and marketing wild blueberries. Over the course of four generations, the company has perfected the science of fresh freezing fruit to maintain optimum flavor and nutritional benefits.

During harvest, Wyman's processes 1.2 million pounds of blueberries a day. Using RGGI funds through Efficiency Maine's Large Customer Program, Wyman's upgraded its cold storage refrigeration system with a nearly \$260,000 incentive toward the total project cost of \$1.4 million. The new high-efficiency system consists of two compressors, one fitted with a variable frequency drive for more efficient part-time operation, and oversized condensers and evaporators which lower system pressure. An automated system now controls the equipment remotely, and the existing roll-up doors were replaced with more efficient air curtains that allow employees to move freely in and out of the cold-storage area. The air curtains help maintain optimum cold storage temperatures.

Wyman's expects to save more than 1 million kWh a year. Bob Stanley, Director of Engineering at Wyman's, explains that in August when the bagging operation runs 24/7 and the company's equipment is running at capacity, it puts quite a load on the electric grid. "When we fire up all these freezers in August here in Cherryfield and at our other nearby facilities, it's a huge load," says Stanley. "Our cold storage system is as energy-efficient as anyone can design."



Starting in July 2013, Maine will be investing 85 percent of its CO<sub>2</sub> allowance proceeds in residential and commercial energy efficiency programs and grants for large-scale industrial energy efficiency and conservation projects. The Maine [Department of Environmental Protection \(DEP\)](#) and [Efficiency Maine](#) are authorized to use a portion of proceeds to support program administration, as well as carbon offsets research.

Maine's statutory 10- and 20-year energy savings targets include:

- Capturing all cost-effective energy efficiency resources available for electric and natural gas utility ratepayers
- Achieving electricity, natural gas and heating oil savings of 20 percent within a decade
- Substantial weatherization of all homes by 2030

### Resources

[Efficiency Maine 2012 Annual Report](#)

[Efficiency Maine Residential Programs](#)

[Efficiency Maine Business Programs](#)



## Maryland

Maryland invests all auction revenues from the sale of CO<sub>2</sub> allowances into the State's Strategic Energy Investment Fund (SEIF), a special, non-lapsing fund administered by the [Maryland Energy Administration](#) (MEA). SEIF funds are used to promote affordable, reliable and clean energy. As part of Governor O'Malley's "[Smart, Green and Growing](#)" initiative, these programs have helped reduce household bills, create new "green collar" jobs, address global climate change, and promote energy independence.

Maryland's energy efficiency investments have:

- Supported energy efficiency upgrades at 4,320 low-income apartments
- Funded technical assistance, energy assessments, and/or rebates for energy efficiency equipment at 360 farms
- Provided energy efficiency job training to 900 workers
- Saved Marylanders nearly \$107 million in projected lifetime energy savings.

RGGI allowance proceeds have also helped 3,100 families and 106 businesses in Maryland install solar, wind, and geothermal systems, thereby offsetting the need for more than 350,000 projected MWh of electricity generation over their lifetime. These new clean distributed renewable energy systems will also help to defer expensive transmission upgrades.

Finally, RGGI allowance proceeds have been used to help more than 104,000 low-income Maryland families pay their energy bills.

Figure 13

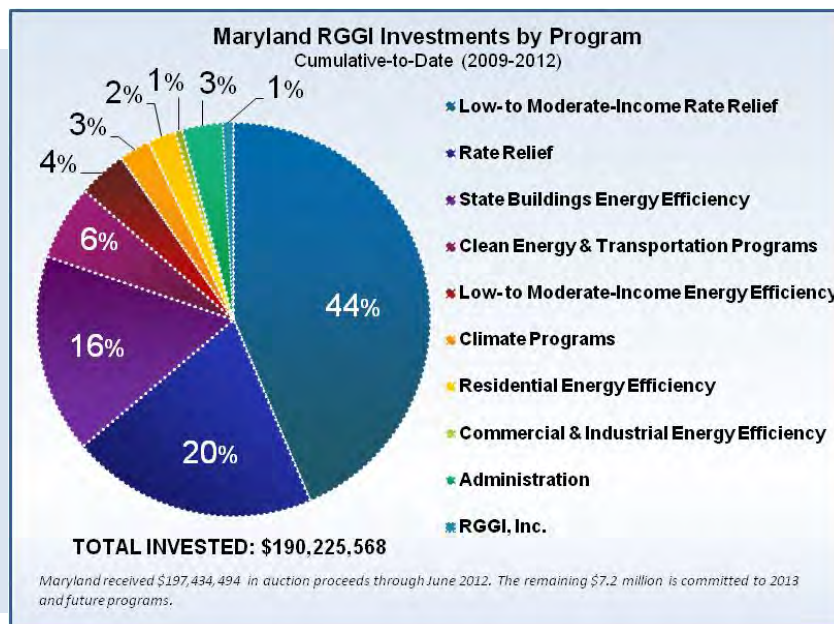
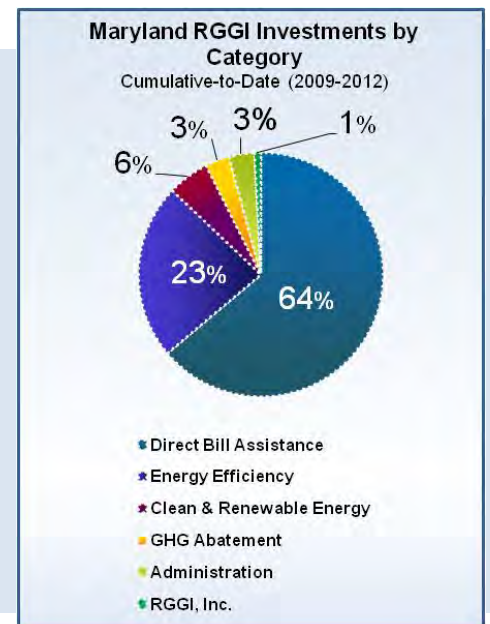


Figure 14



### Program Highlight: EmPOWERing Clean Communities Program

Since its inception in 2009, Maryland's RGGI-funded [EmPOWERing Clean Communities](#) program has provided energy efficiency grants to 10,400 low-to-moderate income families and 160 local governments and non-profits. As part of Governor O'Malley's [EmPOWER Maryland](#) initiative, which seeks to reduce the state's energy consumption 15 percent by 2015, the program has enabled organizations ranging from Habitat for Humanity, to the Boys and Girls Club, to the National Aquarium in Baltimore Harbor to implement energy efficiency initiatives that save money and reduce GHG emissions.

In all, the EmPOWER Clean Communities program will help avoid the generation of 158,235 MWh, providing program participants with \$38.15 million in projected lifetime energy savings. MEA estimates that more than 100 Maryland jobs have been created or sustained by the program.

### Success Story: More Than A Million Dollars Saved Through RGGI-Funded Program

Since 2009, nearly 2,000 households have received energy efficiency upgrade services from Civic Works, an urban service corps dedicated to strengthening communities in and around Baltimore. The non-profit used EmPOWER Clean Energy Communities grant funding, provided by RGGI proceeds, to help finance the projects. Estimates suggest that these energy and cost-saving projects are likely to save more than 700 MWh annually, which is the equivalent of more than \$1.5 million dollars saved over the life of the measures. This tremendous savings would not have been possible without Civic Works.

"The greatest part of the partnership with the MEA-administered Regional Greenhouse Gas Initiative funds is that the desired energy savings and money savings is very quickly administered to low-income homeowners such that the results are seen on their monthly bills," said Earl Millett, COO of Civic Works. "The items are installed by our youth trainees, so we know our communities are more energy efficient by 10 homes every day we send our teams out."

Over the years, MEA's grant funding has primarily paid for the labor costs associated with Civic Works Project Lightbulb and EnergyReady programs. Project Lightbulb uses AmeriCorp members, who themselves are low or moderate income, to install low-cost energy efficiency measures like compact fluorescent lights (CFLs), low flow showerheads, and pipe insulation in low and moderate income homes. A subset of the Project Lightbulb recipients are then selected for participation in EnergyReady, a program that provides whole home energy retrofits that include measures like air sealing and insulation upgrades.



### Resources

[Maryland Energy Administration](#)

[Maryland Energy Administration 2012 Year in Review](#)

[Maryland Energy Administration Success Stories](#)



## Massachusetts

Massachusetts has used its CO<sub>2</sub> allowance proceeds to advance the Commonwealth's clean energy vision by directing more than 90 percent into clean energy programs and initiatives, primarily its nation-leading Energy Efficiency Investment Plans that are delivered statewide through **Mass Save<sup>®</sup>**, and the **Green Communities Designation and Grant Program** for cities and towns that have met ambitious criteria. These programs are fueling a cleaner energy future for the Commonwealth by reducing GHG emissions, building the clean energy economy, and increasing the predictability of energy costs.

Since 2008, Massachusetts has received more than \$178 million in RGGI proceeds, which it has used to implement programs that improve building performance, comfort, durability, health, and affordability for individuals, businesses, and state and local governments.

In 2012, the electric and natural gas utilities and energy efficiency providers that deliver Mass Save<sup>®</sup> statewide energy efficiency programs to low income, residential, institutional and business customers served more than 70,000 Massachusetts residential participants and more than 1,300 business participants. These programs receive the vast majority of the RGGI auction proceeds and are also funded by the state's Energy Efficiency Reconciliation Factor (EERF), system benefit charges, and regional forward capacity market auction proceeds. Mass Save<sup>®</sup> programs provide energy assessments, air sealing and weatherization, rebates for highly efficient lighting, boilers, furnaces and air conditioning, as well as industrial process improvements and combined heat and power. In addition, there are incentives to promote the development of markets for energy-efficient technologies, building code consultations, community based initiatives, public education and outreach, and other programs that support the development and commercialization of energy-efficient products and practices.

Massachusetts' energy policies and programs, like those funded in part by RGGI auction proceeds, earned Massachusetts the **number one** energy efficiency ranking in the U.S. in the American Council for an Energy Efficient Economy's 2012 Scorecard.

Figure 15

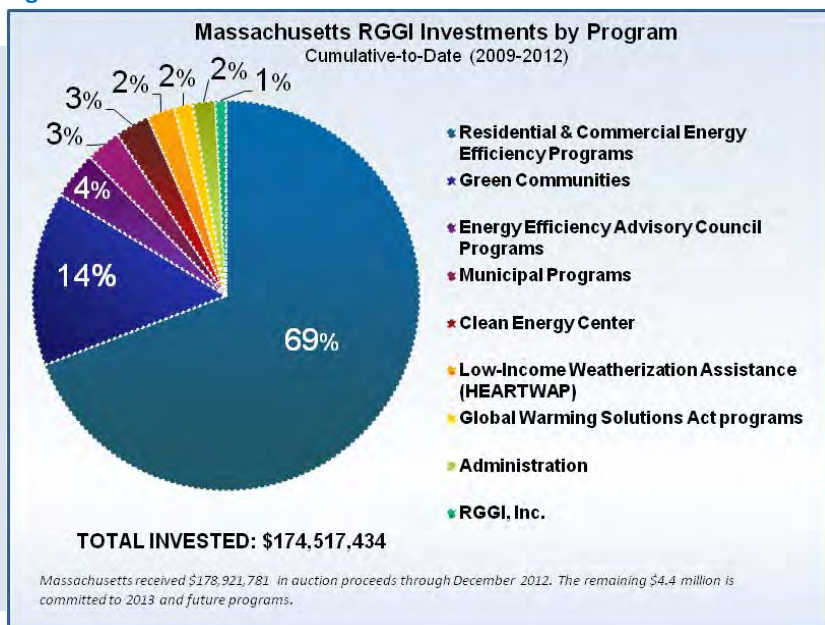
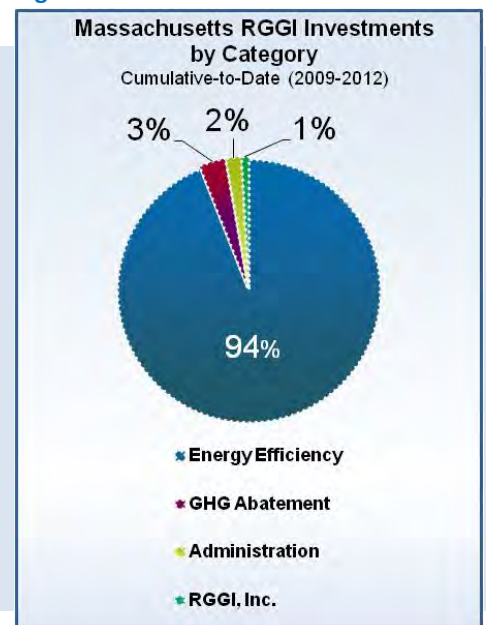


Figure 16



## Program Highlight: Green Communities

The Massachusetts Department of Energy Resources' Green Communities Division provides energy expertise and tools to all 351 Massachusetts municipalities to help them maximize energy efficiency in public buildings, including schools, water and wastewater facilities, and public works and public safety buildings; generate clean energy from renewable sources; and manage rising energy costs. Through 2012, 110 cities and towns from Cape Cod to the Berkshires have earned the Commonwealth's Green Communities designation, making them eligible to receive RGGI-funded grants to pursue additional efficiency and renewable energy improvements. To date, the 110 Green Communities have committed to a total energy reduction equivalent to the annual energy consumption of over 13,600 homes. In GHG reduction terms, this commitment equates to taking nearly 31,000 cars off the road.

### Success Story: Combined Heat and Power at the University of Massachusetts Medical School

The University of Massachusetts Medical School (UMMS) now meets a majority of its Worcester campus' electrical heating and cooling demands through its onsite power plant. In 2012, the University expanded its existing Combined Heat and Power (CHP) plant by installing an additional 7.5 MW "Topping Cycle" solar combustion gas turbine/generator. This high-efficiency CHP system includes a Heat Recovery Steam Generator (HRSG) that converts waste heat from the combustion turbine exhaust into steam, which is then used to generate additional electricity and heating. The steam is also used to generate chilled water from steam driven chillers for cooling. As a result, the expansion of the central utility plant has increased the university's electrical generation capacity from 10 MW to 17.5 MW, and the efficiency of the expanded plant has increased about 15 percent.

Because the plant displaces grid supplied electricity and uses recovered heat, the updated CHP system is projected to reduce net source GHG emissions by more than 400,000 short tons over a 20 year lifespan — equivalent to removing more than 75,000 passenger vehicles from the road for an entire year. The CHP system is projected to displace more than 1,700,000 MWh of grid-supplied power, enough electricity to power approximately 225,000 average homes for one year.

The expansion of UMMS' combined heat and power plant was made possible partly through a \$5.6 million Mass Save<sup>®</sup> incentive for CHP provided through National Grid, the largest CHP program incentive to date. Mass Save<sup>®</sup> efficiency incentives, including those for CHP, are funded in part by RGGI auction proceeds, which help make it possible for UMMS to reduce its need for grid-supplied electricity, increase its energy efficiency and resiliency, while reducing net source GHG emissions.



## Resources

[Massachusetts Department of Energy Resources](#)

[Massachusetts Dept. of Energy Resources' Green Communities Program](#)

[Mass Save<sup>®</sup>](#)





## New Hampshire

On June 23, 2012, New Hampshire enacted House Bill 1490, which revised the state's investment plan for its RGGI CO<sub>2</sub> allowance proceeds, effective January 1, 2013. Under the bill, New Hampshire's proceeds from the sale of RGGI CO<sub>2</sub> allowances will now supplement the electric distribution company CORE energy efficiency programs, funded by the System Benefits Charge (SBC) funds. Commission Order No. 25,425 authorized approximately \$3.2 million in RGGI funds for energy efficiency programs in 2012. Approximately \$1.4 million was spent, with the remaining \$1.8 million carried over to programs in 2013. In 2012, residential programs accounted for approximately 44 percent of the spending; and commercial and industrial programs accounted for approximately 56 percent of the spending. Projected cumulative lifetime energy savings due to 2012 spending are expected to be \$6 million, or \$4.35 per dollar spent.

Prior to this legislative change, New Hampshire directed more than 90 percent of its RGGI proceed clean energy investments to energy efficiency programs, such as the Stay Warm NH and the [Greenhouse Gas Emissions Reduction Fund](#) (GHGERF) managed by the New Hampshire [Public Utilities Commission](#).

Examples of programs funded by the GHGERF include a multi-family housing program implemented by the [New Hampshire Housing Finance Authority](#), the [Pay for Performance \(P4P\)](#) program that takes a comprehensive, whole-building approach to saving energy in large commercial/industrial facilities and a highly-successful workforce training program implemented by [Lakes Region Community College](#) in partnership with the [Plymouth Area Renewable Energy Initiative \(PAREI\)](#).

Figure 17

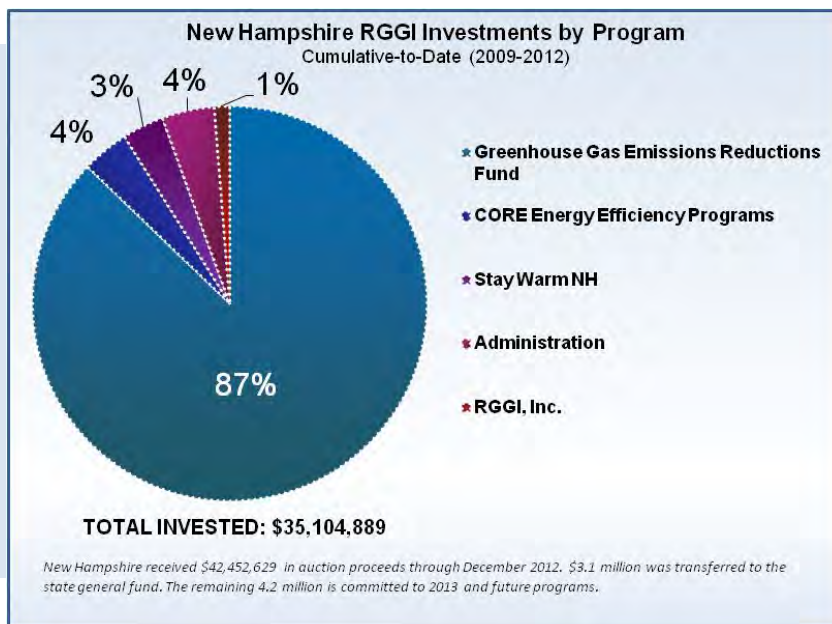
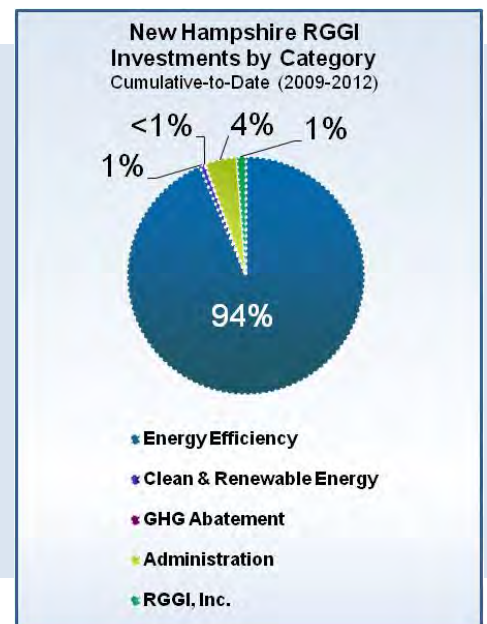


Figure 18



Analysis conducted by the [University of New Hampshire Carbon Solutions New England](#) program found that as of June 2012, projected cumulative energy savings due to GHGERF funded projects (\$21.8 million spent) are expected to be \$107.8 million through 2030 based on current energy prices. For every dollar spent as of June 2012, the projected expected return is \$4.95 in energy savings.

### **Program Highlight: New Hampshire Pay for Performance Program (NH P4P)**

Currently in its third year, the New Hampshire Pay for Performance Program (NH P4P), has not only met, but is surpassing the energy savings goals that were set forth when the program launched. With funding from the GHGERF, TRC Energy Services designed and manages the NH P4P Program which has delivered comprehensive energy efficiency solutions to 47 commercial, industrial, and municipal facilities across the state, totaling more than \$12 million in construction (see map at <http://nhp4p.com/program-impact>).

Through a network of approved Partner firms, energy reduction plans are developed for each project to meet at least a 15 percent reduction goal in total facility source energy consumption, using EPA's Portfolio Manager benchmarking tool to set the baseline. Eligible participants are paid incentives based on energy savings, up to \$300,000 and capped at 50 percent of project cost.

With a whole-building approach to energy savings, NH P4P estimates that it has saved more than 10.6 million kWh of electricity and 71,000 mmBTU of fossil fuels – resulting in projected GHG reductions of more than 12,000 short tons.

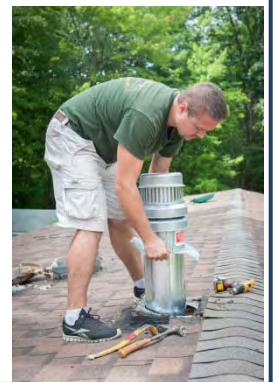
### **Success Story: More Efficient Weatherization of Manufactured Homes Save Time and Money**

It's a simple goal: Make weatherization more like an assembly line and less like an artisan's workshop. The NH Community Loan Fund and the state's five Community Action Agencies achieved that goal by weatherizing 382 homes in 37 resident-owned manufactured housing communities.

A \$2 million grant from New Hampshire's Regional Greenhouse Gas Emissions Reduction Fund leveraged a \$600,000 U.S. Department of Energy Weatherization Innovation Pilot Program grant and about \$1 million in state Systems Benefit Charge funds. Using these funds, the Community Action Agencies trained crews statewide in how to weatherize manufactured homes while taking advantage of "close proximity production": moving from home to home within a single manufactured-housing community until all of the eligible homes were improved.

For example, at the Freedom Hill manufactured home community in Loudon, two four-man crews completed nine homes in 12 days, a process that saved on travel time between homes and down-time between jobs, thereby reducing production costs. The work they completed will save homeowners 25 to 50 percent on their energy costs.

In all, this first-of-its-kind project will improve the economic stability and health of some of N.H.'s poorest households, while demonstrating how more homes can be weatherized with fewer dollars.



[2012 RGGI Annual Report to NH Legislature](#)

[New Hampshire Public Utilities Commission Greenhouse Gas Emissions Reduction Fund](#)



## New York

New York's investment of RGGI proceeds is based on a comprehensive and strategic assessment of the most effective practices to support continued achievements in carbon abatement, energy efficiency improvements and renewable energy development. This approach includes innovative initiatives that span the entire green energy economy. In addition to funding for energy audits and installation of energy efficiency measures and cleaner energy sources in residential, commercial and industrial buildings, RGGI funds are invested in transformative programs that remove barriers and enhance adoption of carbon reduction practices.

Among New York's transformative approaches to the use of RGGI proceeds is the **Cleaner, Greener Communities** program. Launched in 2012 by Governor Andrew M. Cuomo, this is a \$100 million statewide initiative to invest in reducing GHG pollution through smart growth planning and sustainability.

RGGI proceeds are also driving GHG pollution reductions through support for 16 large-scale, cost-shared, energy efficiency, renewable energy and carbon abatement projects under the state's **Regional Economic Development and Greenhouse Gas Reduction Program**. These projects will address regional priorities and position each region to reduce GHG emissions while stimulating long-term economic growth and environmental stewardship. They include approaches such as:

- Construction of a net zero energy building at the State University of New York College of Nanoscale Science and Engineering in Albany
- Conversion from heating oil to lower-emission natural gas at an International Paper plant in Ticonderoga
- Transition to low-emission, compressed natural gas, heavy-duty trucks for Willow Run Foods that will travel throughout metro New York

Figure 19

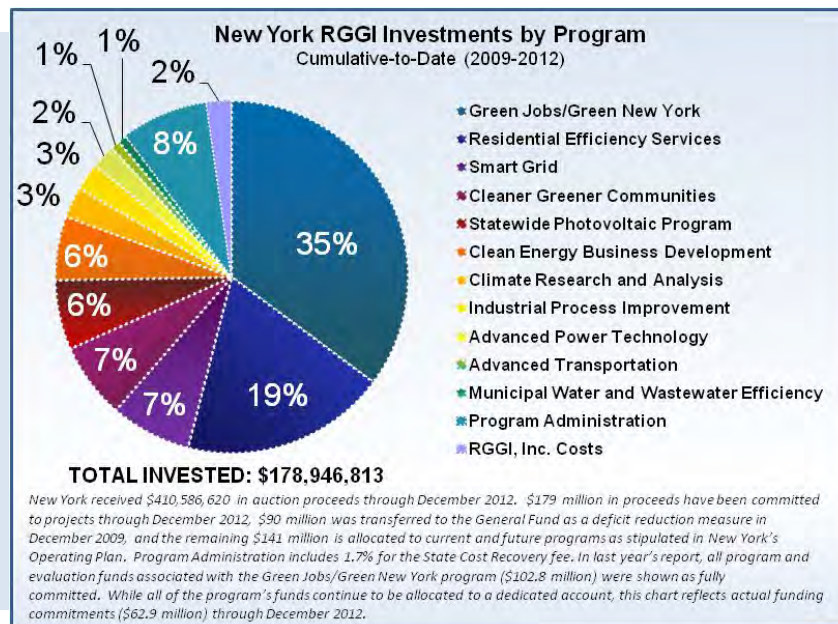
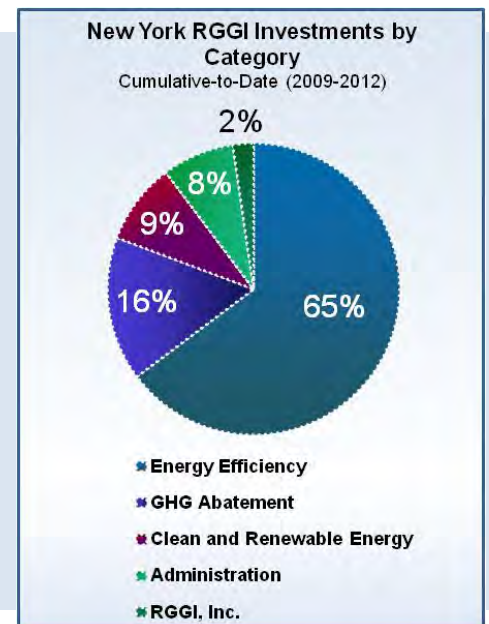


Figure 20



## Program Highlight: Cleaner, Greener Communities

[Governor Cuomo's Cleaner, Greener Communities](#) initiative provided funding from RGGI proceeds for the development of regional sustainability plans that commit communities to a transition to more energy efficiency and clean energy in buildings, transportation, land use, waste management, water management and agriculture/forestry, while supporting sustainable economic development and fostering livable communities. Each regional planning consortium conducted a GHG emissions study that calculated current GHG emissions and projected GHG reductions that would result from implementing the sustainability plan. A few examples of emission reduction goals from the ten regional plans include:

- The Capital Region seeks to realize a 25 percent per capita reduction in GHG emissions over the next 20 years
- Western New York seeks to reduce GHG emissions by 30 percent by 2020
- The Southern Tier seeks to reduce GHG emissions in the residential and commercial sectors by 39 percent

Building on existing regional assets, each plan takes a comprehensive, tailored approach to outline the region's vision, goals and objectives for a sustainable future and identify specific ideas leading to plan implementation. The plans set up the regions for phase 2 of Cleaner, Greener Communities, during which \$90 million in RGGI funding will be committed to projects that have the most impact on carbon abatement in the regions and that best move plans to fruition.

### Success Story: Homegrown Hydrogen Gas Recycling Technology Helps Reduce GHG Emissions

New York State is using RGGI proceeds to help H2Pump LLC, based in Latham, New York, commercialize high-tech, energy-saving equipment that recycles hydrogen used in industrial processes, thus significantly reducing the use of petroleum and subsequent GHG emissions from hydrogen production and transport. In many industrial processes, including metal heat-treating and semiconductor fabrication, hydrogen is used to create a specialized atmosphere for chemical processes and is released into the atmosphere after a single use. The hydrogen provides an oxygen-free atmosphere that enhances productivity and product quality. The manufacturing of that hydrogen, however, requires petroleum products, as does the transportation of the hydrogen to manufacturing facilities.

RGGI funds are supporting the installation of H2Pump products at five sites across New York to gather data and experience that will accelerate market adoption of this energy saving equipment. These installations demonstrate the energy-savings, as well as cost-savings, that can be achieved through the capture, purification and recirculation of hydrogen used during industrial processes. With H2Pump's technology, up to 90 percent of the hydrogen used will be recovered, purified, pressurized and returned for reuse. Tens of thousands of manufacturing furnaces are currently in operation in New York that use at least a 20 percent hydrogen atmosphere — all potential H2Pump customers that would help decrease GHG emissions.



## Resources

[2012 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](#)

[New York's RGGI-Funded Programs Status Report, Quarter Ending December 31, 2012](#)



## Rhode Island

Rhode Island primarily invests CO<sub>2</sub> allowance proceeds in energy efficiency and conservation, and may also invest in renewable non-carbon emitting energy technologies, cost-effective direct rate relief for consumers and direct rate relief for low-income consumers. As of December 2012 the Rhode Island Office of Energy Resources has worked in conjunction with the state's primary electric utility, [National Grid](#), to expand energy efficiency programs to deliver maximum benefits to residential, commercial, and industrial consumers; low-income households; local governments; and also to provide education programs.

In 2012 RGGI funds were invested in the Small Business Revolving Loan Fund which helps businesses reduce their energy costs with energy efficient equipment such as lighting upgrades, lighting occupancy sensors, walk-in cooler efficiency measures, and site-specific custom projects. National Grid offers incentives for up to 70 percent of the cost of the installation of qualified equipment and then finances the customers' share of the cost with interest-free financing up to 24 months. The customer then repays this financing through their monthly electric bills. In 2012 approximately 490 small businesses participated in the program, helping these customers save more than 6,500 MWh that year and approximately 120,000 projected MWh over the lifetime of the energy efficiency investments.

RGGI funds were also invested in the Large Business Revolving Loan Fund. This fund helps large commercial and industrial (LC&I) customers invest in energy efficiency by financing their portion of the project cost, then allowing them to repay this financing on their electricity bill over the next two years. In 2012 approximately 64 large businesses participated in the program, which helped them save more than 6,000 MWh that year and save approximately 75,000 projected MWh over the lifetime of these investments.

These and other energy efficiency programs helped to make Rhode Island [seventh in the nation](#) in energy efficiency investments in 2012, according to the American Council for an Energy Efficient Economy.

Figure 21

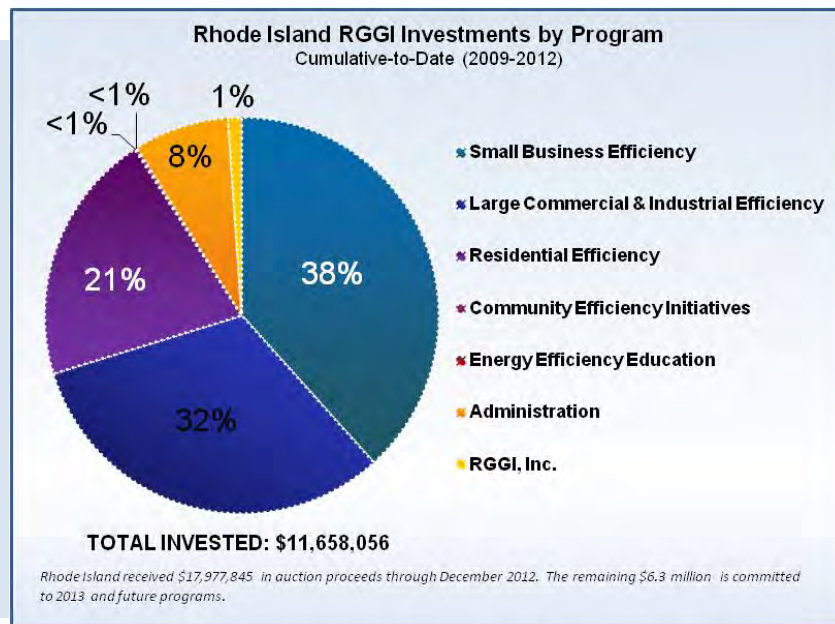
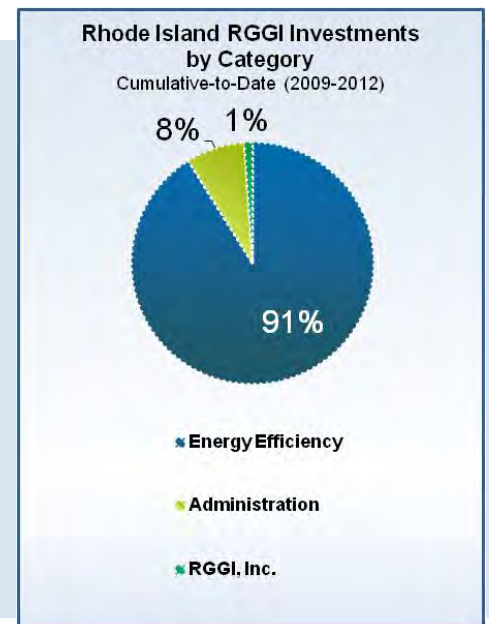


Figure 22



### Program Highlight: Large Business Revolving Loan Fund

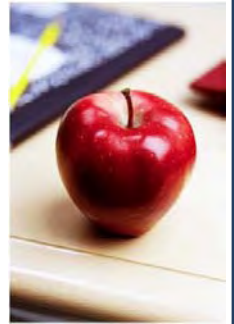
In 2012, roughly 64 large businesses and other organizations in Rhode Island have combined rebates with on-bill financing to make smart investments in energy efficiency through National Grid's large business revolving loan fund, made possible by RGGI. The fund allows these organizations to finance the customer's share of energy efficiency upgrades (after deducting utility rebates) with zero percent interest for up to 24 months. The program makes it easier for large businesses to avoid what can be a prohibitively high up-front charge associated with efficiency improvements, and instead pay for the measure with the energy savings they realize on their bills.

Efficiency measures covered by the program range from lighting upgrades to walk-in cooler measures to occupancy sensors, and are helping many businesses save big on their energy bills. So far, efficiency measures installed with the help of the program have generated approximately 6,442 annual MWh and 78,339 lifetime MWh in energy savings, and will save participants a projected \$6.8 million on their energy bills over their lifetime.

#### Success Story: Rhode Island School and Fitness Center Save Energy with Efficiency Upgrades

In 2012, a public school signed up for National Grid's lighting and controls energy efficiency program in order to implement several lighting energy efficiency upgrades. When installed, these lighting upgrades resulted in a 15,000,000 kWh of electricity energy savings for the school. The total cost of upgrades was \$680,606 of which \$225,681 was paid for through National Grid's energy efficiency incentives program. The remaining \$454,925 were loaned to the school under the RGGI supported Large Business Revolving Loan Fund. The school is scheduled to pay back this loan using a zero percent On Bill Financing mechanism within a period of 24 months.

In addition, in 2012 a chain fitness center in Rhode Island signed up for National Grid's Heating, Ventilation, and Air Conditioning (HVAC) retrofit program. The program helped the fitness center complete HVAC upgrades that will reduce its annual electricity usage by 210,000 kWh. The total cost of the upgrade was \$47,293, of which the customer received \$18,450 through National Grid's energy efficiency incentive program. The fitness center secured the remaining \$28,843 necessary for the upgrades through Rhode Island's Large Business Revolving Loan Fund, and is currently paying back the loan using a zero percent On Bill Financing mechanism.



#### Resources

[National Grid Residential Energy Efficiency Resources](#)

[National Grid Small Business Energy Efficiency Resources](#)

[National Grid Large Business Energy Efficiency Resources](#)

[Rhode Island 2012 RGGI Annual Report](#)

[2011 Plan for the Allocation and Distribution of Regional Greenhouse Gas Initiative Auction Proceeds](#)



## Vermont

Vermont currently invests the majority of its CO<sub>2</sub> allowance proceeds to enable [Efficiency Vermont](#) and [Burlington Electric Department](#) to expand their electrical energy efficiency programs to include thermal energy and process fuel efficiency programs. Efficiency Vermont, the nation's first ratepayer-funded energy efficiency utility is overseen by the Vermont [Public Service Board](#). Vermont's Efficiency programs have a proven track record of implementing cost-effective energy efficiency programs for commercial and residential energy consumer.

Efficiency Vermont's and Burlington Electric's thermal energy and process fuel efficiency programs are funded through a combination of Vermont's participation in RGGI and Efficiency Vermont's participation in the regional grid's forward capacity market. In 2012, Vermont's thermal energy and process fuel efficiency programs funded by RGGI are projected to result in incremental energy savings of more than 26,000 mmBTUs and avoid the emission of an estimated 1,800 short tons of CO<sub>2</sub>. RGGI programs contributed to heating and process fuel efficiency programs that served more than 2,400 households and 130 businesses.

Programs currently supported by CO<sub>2</sub> allowance proceeds include the [Home Performance with ENERGY STAR®](#) service, a program to provide incentives of up to \$2,500 for comprehensive retrofits that address both electric and non-electric energy efficiency needs, and the Building Performance service that provides incentives of up to \$5,100 for comprehensive thermal efficiency services to small business customers.

These and other energy efficiency programs helped to make Vermont [fifth in the nation](#) in energy efficiency investments in 2012, according to the American Council for an Energy Efficient Economy.

Figure 23

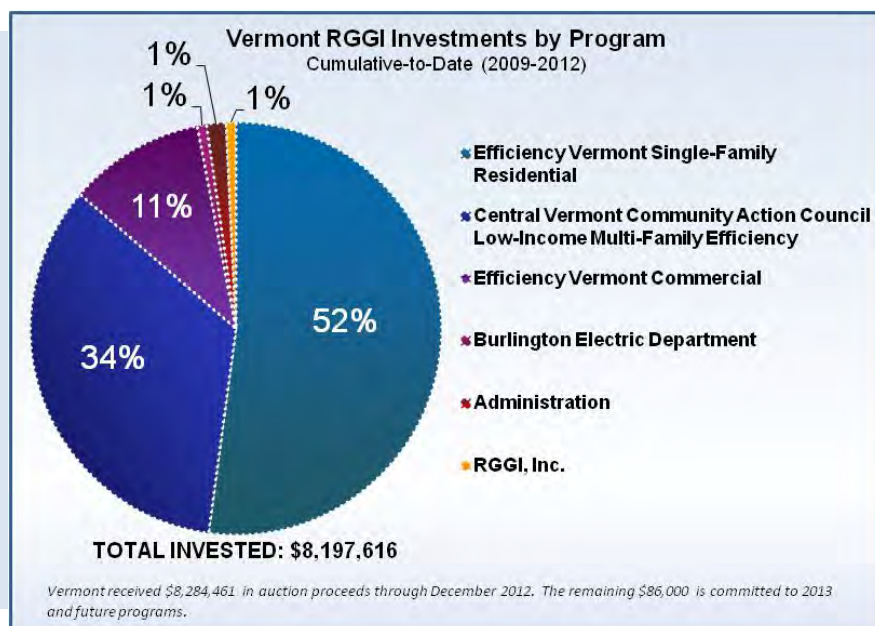
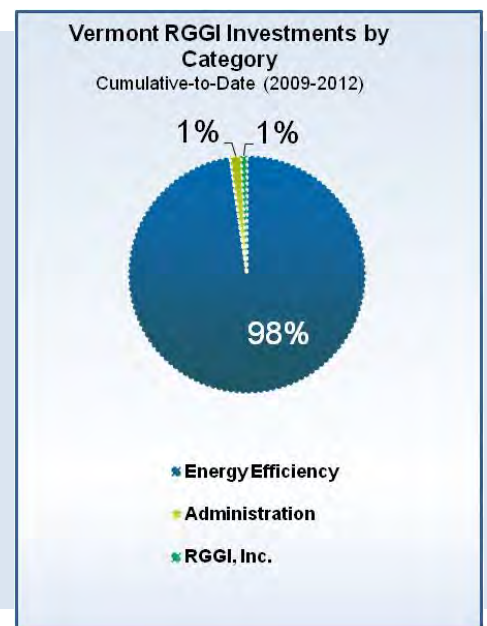


Figure 24



### Program Highlight: Efficiency Vermont's Home Performance with ENERGY STAR®

Efficiency Vermont's [Home Performance with ENERGY STAR®](#) program is delivered to customers through a network of private service providers and other partners. In 2012, 74 building contractors supported the program, completing 1050 projects. A typical Home Performance with ENERGY STAR® home improvement project begins with a comprehensive energy audit of the home, conducted by a certified Home Performance with ENERGY STAR® contractor. The audit identifies recommended energy-saving home improvements specific to the home, along with associated energy savings. The homeowner can then make informed decisions about which efficiency improvements to prioritize, and work with their contractor to complete specific improvements. RGGI proceeds contribute about one-third of the funding used to run Efficiency Vermont's Home Performance with ENERGY STAR® program.

In residential new construction, Efficiency Vermont launched a significant initiative to accommodate improvements to the state energy code and the ENERGY STAR® Homes standard. For existing homes, Efficiency Vermont's comprehensive Home Performance with ENERGY STAR® service grew in 2012, with the number of projects expanded to approximately 1050, a 30 percent increase over 2011.

#### Success Story: Roxbury turns adversity into opportunity

In 2011, the historic Roxbury Community Hall suffered extensive damage in Tropical Storm Irene. Rather than simply restoring the hall to its original state, the town's energy committee decided to take advantage of the opportunity to rebuild, and renovate the building in a way that would ensure maximum energy efficiency and financial sustainability for years to come.

From air sealing and insulation to moisture remediation throughout, no corner of the building was left untouched. The most notable improvements came from separating the second floor, used only for storage, from the conditioned spaces below. Efficiency Vermont worked with the Roxbury Energy Committee and EnergySmart of Vermont, providing technical expertise and overseeing quality control throughout the rebuilding process.

Said Paul ZaBriskie, a contractor at EnergySmart of Vermont, "Working with Efficiency Vermont allowed us to incorporate electrical and air quality upgrades along with air sealing and insulation, to create a building that the community can afford to operate well into the future."

Today, the Roxbury Community Hall remains an important gathering place, and is one of the most-used and most-loved buildings in the town.



#### Resources

[Efficiency Vermont Residential Programs](#)

[Efficiency Vermont Business Programs](#)

[Efficiency Vermont 2012 Highlights](#)

[Vermont CO<sub>2</sub> Budget Trading Regulations](#)



## Appendix

### Glossary of Terms

#### Program Categories

##### **Administration**

Funds directed to administrative overhead expense associated with all RGGI-funded programs, including outsourced and in-house overhead expenses.

##### **Clean and Renewable Energy**

Programs directed at accelerating the deployment of renewable or other non-carbon emitting energy technologies. Program costs include evaluation and measurement. Examples: wind, solar, fuel cell, biomass, and hydroelectric power.

##### **Direct Bill Assistance**

Programs providing energy bill payment assistance, including direct bill assistance to low-income ratepayers. Program costs include evaluation and measurement.

##### **Energy Efficiency**

Programs designed to improve energy efficiency by reducing overall energy use without degrading functionality. This includes programs directed at assisting low-income families and small business. Program costs include evaluation and measurement. Examples: Home Energy Audit Programs, Home and Building Weatherization, Energy Efficient Appliance or Industrial Equipment Rebate Programs, Compact Fluorescent Light Bulb Programs, and Energy Efficiency Workforce Training Programs.

##### **Greenhouse Gas Abatement**

Programs promoting the research and development of advanced energy technologies, the reduction of vehicle miles traveled, the reduction of emissions in the power generation sector, forestry projects designed to increase carbon sequestration, and other initiatives to reduce greenhouse gases. Program costs include evaluation and measurement.

##### **RGGI, Inc.**

Funds provided to RGGI, Inc. to support and implement state CO<sub>2</sub> Budget Trading programs.

#### General Terms

##### **RGGI Investments**

RGGI Investments are the proceeds generated by RGGI CO<sub>2</sub> allowance auctions that have been invested by the RGGI states in the programs discussed in this report. These investments do not include New Jersey proceeds or investments, transfers to state general funds, or Future Committed funds.

##### **Future Committed**

Future Committed are the proceeds generated by RGGI CO<sub>2</sub> allowance auctions that have not yet been invested by the RGGI states. Future Committed proceeds represent funds that could be invested by the state in 2013 and beyond.

### **Current Period (2012)**

The twelve-month period being reported, which may be either the fiscal year or calendar year 2012, as defined by each state. See table 2 on page 8 for state-by-state reporting periods.

### **Cumulative-to-Date (To-Date)**

The elapsed time from the inception of the RGGI auctions (Sept. 2008) through the end of the Current Period (i.e. past and present).

### **Lifetime**

The full length of time (past, present, and future) over which effects from each Receiving Program will be realized. Varies by program.

## **Benefits and Statistics**

### **Funds Invested – Current Period (2012)**

Total dollar amount of RGGI proceeds invested in each program for the Current Period (e.g. Calendar year 2012). For programs that are partially funded by RGGI, only the amount provided by RGGI funds is included. Remaining data on these programs is prorated based on the percentage of the program funded by RGGI. For example, if 30 percent of a program's total funding comes from RGGI, 30 percent of the households served by the program are reported under "Participating Households" in this report.

### **Funds Invested – Cumulative-to-Date (To-Date)**

Total dollar amount of RGGI proceeds invested in each program from RGGI's inception through the Current Period. For programs that are partially funded by RGGI, only the amount provided by RGGI funds is included. Remaining data on these programs is prorated based on the percentage of the program funded by RGGI. For example, if 30 percent of a program's total funding comes from RGGI, 30 percent of the households served by the program are reported under "Participating Households" in this report.

### **Participating Households – Cumulative-to-Date (To-Date)**

*Measured in: Number of Households*

Number of households that have directly received assistance as a result of each program (e.g. number of homes weatherized, number of families receiving direct bill assistance, number of households receiving home energy audits, etc...) from inception through the Current Period. Households participating in more than one program may be counted under each program they have participated in (e.g. a completed home energy audit constitutes a participating household even if the household may elect to further participate in programs to install recommended measures). For multi-family dwellings, each unit within the multi-family home is considered to be a household. "Participating Households" may include households whose services have been approved and confirmed, but not yet completed in some states.

### **Participating Businesses – Cumulative-to-Date (To-Date)**

*Measured in: Number of Businesses*

Number of "end-user" businesses and government entities who have directly received assistance as a result of the program (e.g. number of businesses whose offices were weatherized, number of businesses receiving grant assistance to install energy efficiency measures, etc... via a grant, loan, or rebate) from inception through the Current Period. Businesses participating in more than one program will be counted under each program they have participated in (e.g. a completed audit constitutes a Participating Business even if the business may elect to further participate in programs to install recommended measures).

“Participating Businesses” may include businesses whose services have been approved and confirmed, but not yet completed in some states.

**Workers Trained – Cumulative-to-Date (To-Date)**

*Measured in: Number of Workers*

Total number of training seats filled directly by the program from inception through the Current Period. This measure accounts for the fact that some workers may have attended more than one training course as they seek to expand their skills.

**MWh Avoided – Cumulative-to-Date (To-Date)**

*Measured in: MWh*

Estimated total MWh avoided cumulatively from inception through the Current Period as a direct result of Funds Invested from inception through the Current Period (i.e. the total past and present MWh avoided by all Funds Invested to date). Calculated using program-specific savings, as defined by each state.

**MWh Avoided – Lifetime**

*Measured in: MWh*

Estimated total MWh projected to be avoided over the total lifetime of the program as a direct result of cumulative Funds Invested from inception through the Current Period (i.e. the total past, present, and future MWh avoided by all Funds Invested to date). This does not include projected effects from funds not yet expended. Calculated using program-specific savings, as defined by each state.

**mmBTU Avoided – Cumulative-to-Date (To-Date)**

*Measured in: mmBTU*

Estimated total mmBTU avoided from inception through the Current Period as a direct result of Funds Invested from inception through the Current Period (i.e. the total past and present mmBTU avoided by all Funds Invested to date). Calculated using program-specific savings, as defined by each state.

**mmBTU Avoided – Lifetime**

*Measured in: mmBTU*

Estimated total mmBTU projected to be avoided over the total lifetime of the program as a direct result of cumulative Funds Invested from inception through the Current Period (i.e. the total past, present, and future mmBTU avoided by all Funds Invested to date). This does not include projected effects from funds not yet expended. Calculated using program-specific savings as defined by each state.

**Energy Bill Savings – Cumulative-to-Date (To-Date)**

*Measured in: Current Year Dollars*

Estimated gross amount saved from inception through the Current Period by the total number of households and/or businesses participating in the program as a result of cumulative Funds Invested from inception through the Current Period (i.e. the total past and present savings by all program participants to date). Calculated using program-specific savings, as defined by each state. Initial investment in installed measures is not deducted.

**Energy Bill Savings – Lifetime**

*Measured in: Current Year Dollars*

Estimated gross amount projected to be saved over the total lifetime of the program by the households and/or businesses participating in the program as a result of cumulative Funds

Invested from inception through the Current Period (i.e. the total past, present, and future savings by all program participants to date). This does not include projected effects from funds not yet invested. Calculated using program-specific savings, as defined by each state. Initial investment in installed measures is not deducted.

**CO<sub>2</sub> Emissions Avoided – Cumulative-to-Date (To-Date)**

*Measured in: Tons of CO<sub>2</sub>*

Estimated total number of short tons of CO<sub>2</sub> avoided cumulatively from inception through the Current Period as a direct result of cumulative Funds Invested from inception through the Current Period (i.e. the total past and present CO<sub>2</sub> emissions avoided by all Funds Invested to date). Calculated using a program-specific formula, as defined by each state.

**CO<sub>2</sub> Emissions Avoided – Lifetime**

*Measured in: Tons of CO<sub>2</sub>*

Estimated total number of short tons of CO<sub>2</sub> projected to be avoided over the total lifetime of the program as a direct result of cumulative Funds Invested from inception through the Current Period (i.e. the total past, present, and future CO<sub>2</sub> emissions avoided by all Funds Invested to date). This does not include projected effects from funds not yet expended. Calculated using a program-specific formula, as defined by each state.

**Cars Taken Off the Road**

*Measured in: Cars*

Estimated number of cars that would need to be taken “off the road” for one year to reduce CO<sub>2</sub> emissions by the same amount as the RGGI-funded measures. Calculated using average annual CO<sub>2</sub> emissions for passenger cars (10,582 pounds or 5.29 short tons of CO<sub>2</sub>), as published by the U.S. Environmental Protection Agency. View conversion rates at:

<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

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