

The Regional Greenhouse Gas Initiative

An Initiative of the New England and Mid-Atlantic States of the US

The Investment of RGGI Proceeds in 2016

Published September 2018

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Executive Summary

Proceeds from the Regional Greenhouse Gas Initiative (RGGI) have powered a major investment in the energy future of the New England and Mid-Atlantic states. This report reviews the benefits of programs funded in 2016 by \$436.4 million in RGGI investments, which have reduced harmful carbon dioxide (CO₂) pollution while spurring local economic growth and job creation. The lifetime effects of these RGGI investments are projected to save 30.4 million MMBtu of fossil fuel energy and 7.0 million MWh of electricity, avoiding the release of 6.4 million short tons of carbon pollution.

The benefits tracked in this report arise from RGGI investments in energy efficiency, clean and renewable energy, direct bill assistance, and greenhouse gas abatement. Any benefits associated with other types of funds (such as future committed funds or transfers to general funds) are outside the scope of this report.

As a whole, the RGGI states have reduced power sector CO₂ pollution over 50 percent since 2005, while the region's gross domestic product has continued to grow. RGGI-funded programs also save consumers money and help support businesses. RGGI investments in 2016 are estimated to return \$1.7 billion in lifetime energy bill savings to more than 182,000 households and 2,680 businesses which participated in programs funded by RGGI investments, and to more than 800,000 households and 100,000 businesses which received direct bill assistance.

RGGI states have individual discretion as to how they invest RGGI proceeds. RGGI investments fall into four major categories:

Energy efficiency makes up 55 percent of 2016 RGGI investments and 58 percent of cumulative investments. Programs funded by these investments in 2016 are expected to return \$822.8 million in lifetime energy bill savings to over 176,000 participating households and 2,430 businesses in the region.

Clean and renewable energy makes up 17 percent of 2016 RGGI investments and 14 percent of cumulative investments. RGGI investments in these technologies in 2016 are expected to return \$465.1 million in lifetime energy bill savings to 3,182 participating households and 91 businesses in the region.

Greenhouse gas abatement makes up 11 percent of 2016 RGGI investments and 8 percent of cumulative investments. RGGI investments in greenhouse gas (GHG) abatement in 2016 are expected to avoid the release of 1.4 million short tons of harmful CO₂ pollution into the atmosphere.

Direct bill assistance makes up 11 percent of 2016 RGGI investments and 14 percent of cumulative investments. Direct bill assistance programs funded through RGGI in 2016 have returned \$48.6 million in bill credits and assistance to consumers.

These investments, in concert with the broader energy policies in each RGGI state, have enabled the region to continue to set a national example in reducing harmful GHG pollution and improving energy efficiency.

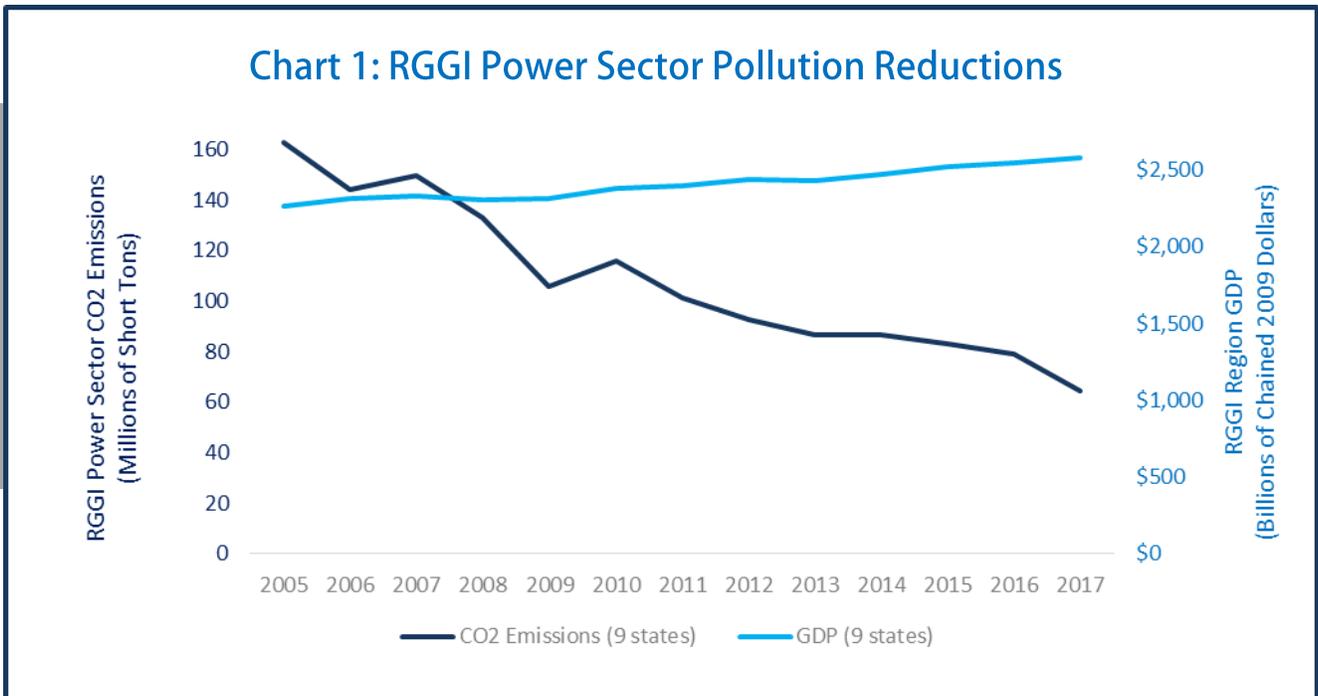
Introduction

The Regional Greenhouse Gas Initiative

RGGI is the nation's first multi-state program to reduce power sector CO₂ emissions. The RGGI states (Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont) establish a regional cap on the amount of CO₂ pollution that power plants can emit, by issuing a limited number of tradable CO₂ allowances. Each allowance represents an authorization for a regulated power plant to emit one short ton of CO₂. Individual CO₂ budget trading programs in each RGGI state together create a regional market for CO₂ allowances. This allows market forces to determine the most cost-effective means of reducing emissions, and creates market certainty needed to drive long-term investments in clean energy. Each state's regulations are independent, and are based on the RGGI Model Rule.

The RGGI states have distributed approximately 90 percent of CO₂ allowances through quarterly regional auctions, generating proceeds for reinvestment. The remaining allowances are allocated to state set-aside accounts, from which allowances may be distributed according to state-specific regulations, or auctioned in future years. Each RGGI state has discretion over the investment of RGGI proceeds, and all programs funded through RGGI investments are independently administered and operated by the states.

The RGGI states have experienced a reduction of more than 86 million short tons of annual power sector carbon pollution since 2005, even as the regional economy has grown (see **Chart 1**). This represents a reduction in power sector carbon pollution of more than 50 percent.



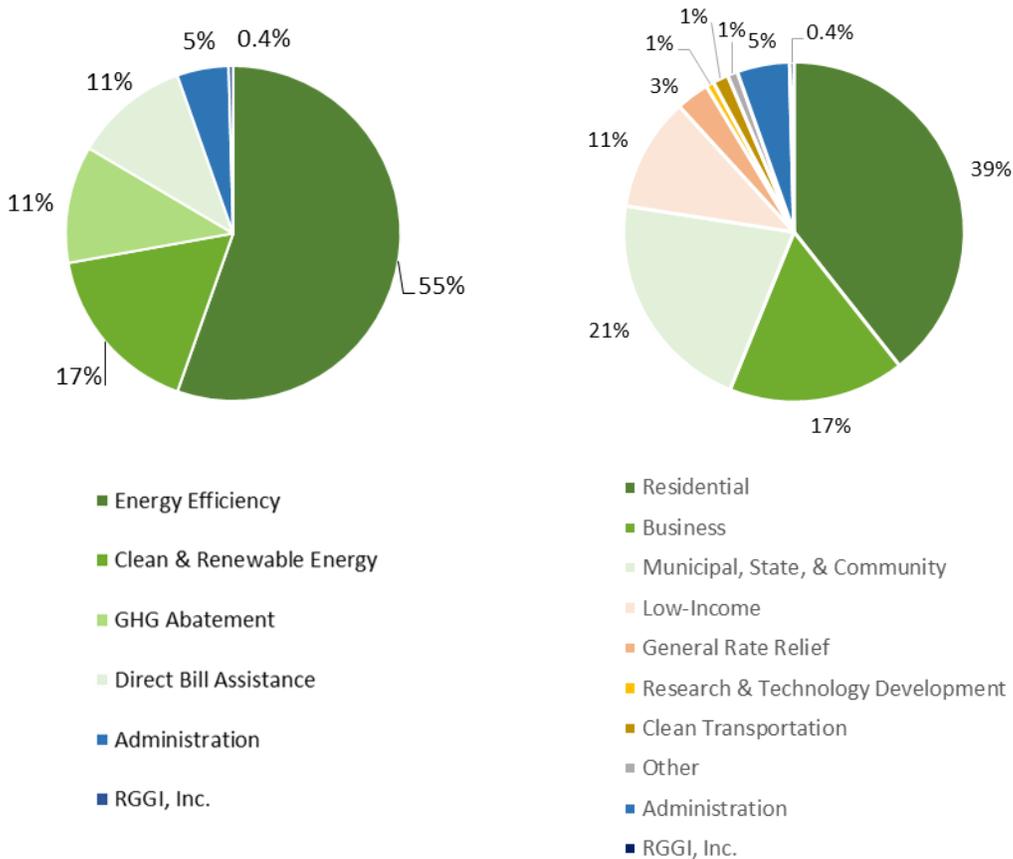
2016 RGGI Investments

This report estimates benefits (such as energy bill savings and short tons of CO₂ emissions avoided) which arise from RGGI investments. RGGI investments as defined within this report include investments in energy efficiency, clean and renewable energy, greenhouse gas abatement, and direct bill assistance, as well as administrative costs associated with these programs.

This report focuses on 2016 annual investments. RGGI investments throughout the region cover a wide variety of programs. **Chart 2** shows how 2016 RGGI investments were divided between major program categories.

Chart 3 illustrates the same 2016 funds divided in a different way, according to the type of end-user who benefits from the program or receives the funding. The energy efficiency and clean energy program categories mainly flow to residential, business, and municipal recipients, with some programs specifically serving low-income households. Direct bill assistance is split between assistance for low-income consumers, and general rate relief for all consumers.

Charts 2 and 3: 2016 RGGI Investments by Category and Recipient



The RGGI states invested \$436,397,470.69 in 2016.

Table 1: Benefits of 2016 RGGI Investments

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	182,135 (Programs)* 806,605 (Bill Assistance)	N/A
 Participating Businesses	2,680 (Programs)* 109,220 (Bill Assistance)	N/A
 Workers Trained	370	N/A
 Short Tons CO ₂ Avoided	382,266	6.4 million
 Equiv. Cars Off Road	74,258	1.2 million
 Megawatt-Hours Saved	409,630	7.0 million
 MMBtu Saved	1.6 million	30.4 million
 Energy Bill Savings	\$150.5 million	\$1.7 billion

*Participants in all programs other than direct bill assistance.

In 2016, over 180,000 households and 2,680 businesses participated in programs funded by RGGI investments, while over 800,000 households and 100,000 businesses received direct bill assistance. These investments have saved participants money on their energy bills, created jobs, and reduced pollution. Over their lifetime they will save participants an estimated \$1.7 billion on their energy bills, and avoid the use of over 7.0 million MWh of electricity and 30.4 million MMBtu of fossil fuel. For details see **Table 1**.

RGGI investments benefit more than just those who directly participate; for example, money not spent on energy by families and businesses can be used in other ways that boost the economy. Reduced demand for energy also keeps power prices lower for everyone, and avoids the need for additional investments in costly infrastructure to meet peak demand.

One of RGGI's strengths is the discretion offered to each state to independently invest RGGI auction proceeds according to state-specific goals. This can present challenges for data collection; for example, a program offering discounts on efficient lightbulbs will collect quite different data from a program helping businesses to install large-scale equipment, or funding the installation of electric car charging stations.

The data in this report are compiled using the output of state-based and program-based estimates for actual and projected savings and benefits. Methods for estimating program benefits differ between states and between programs, which are each unique. The appendix at the end of this report contains more details on how each metric is estimated for different types of programs.

States may also combine RGGI funds with funds from other sources; in these cases, the reported benefits from the program are typically adjusted based on the percentage of the program’s funding which comes from RGGI.

Due to rounding, pie chart percentages may not always sum exactly to 100 percent.

Energy Efficiency

Energy efficiency represents the largest portion of 2016 RGGI investments, at 55 percent. Over the lifetime of the installed measures, 2016 investments in energy efficiency funded through RGGI proceeds are projected to save participants \$822.8 million on energy bills, providing benefits to more than 176,000 participating households and 2,430 participating businesses. They are also projected to avoid the release of 3.3 million short tons of CO₂ pollution (see **Table 2**).

Table 2: Benefits of 2016 RGGI Investments in Energy Efficiency

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	176,518	N/A
 Participating Businesses	2,430	N/A
 Workers Trained	370	N/A
 Short Tons CO ₂ Avoided	224,579	3.3 million
 Equiv. Cars Off Road	43,626	638,257
 Megawatt-Hours Saved	281,741	4.5 million
 MMBtu Saved	1.1 million	22.4 million
 Energy Bill Savings	\$49.7 million	\$822.8 million

Energy efficiency improvements can be achieved cost-effectively by upgrading appliances and lighting, weatherizing and insulating buildings, upgrading HVAC at offices, and improving industrial processes. For example, occupancy sensors automatically turn lights off when a room or building is not in use, saving significant amounts of energy. These programs allow consumers and businesses to take full advantage of modern appliances, heating, and cooling, increasing the comfort of homes, offices, and businesses while using less energy and paying less on their energy bills.

Energy efficiency is also a job creator. Programs such as home retrofits directly spur employment gains in housing and construction, and 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.

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 be deferred in some cases. The full economy-wide benefits of energy efficiency are not modeled in this report. However, a range of other independent reports have affirmed these widespread benefits of energy efficiency, including work by the Analysis Group, Regulatory Assistance Project, and more.

RGGI-funded investments in energy efficiency, in concert with the broader energy policies in each RGGI state, have made an impact. Six RGGI states once again ranked among 2016's top ten states for energy efficiency, according to the American Council for an Energy Efficient Economy.

Clean and Renewable Energy

Clean and renewable energy represents 17 percent of 2016 RGGI investments in the region. Over the lifetime of the projects installed in 2016, these investments are projected to offset \$465.1 million in energy expenses for more than 3,000 participating households and 91 businesses. They are also projected to avoid the release of 1.7 million short tons of CO₂ pollution (see **Table 3**).

Table 3: Benefits of 2016 RGGI Investments in Clean Energy

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	3,182	N/A
 Participating Businesses	91	N/A
 Short Tons CO ₂ Avoided	71,227	1.7 million
 Equiv. Cars Off Road	13,836	323,151
 Megawatt-Hours Saved	127,772	2.6 million
 MMBtu Saved	18,176	421,260
 Energy Bill Savings	\$16.8 million	\$465.1 million

Clean energy systems require labor to install, which directly creates jobs and boosts local economic activity. Energy expenditures that might otherwise be used to purchase out-of-state fossil fuel resources are kept within the region. As with 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 long-term prices down for all consumers. Households and businesses both with and without clean energy systems save money on their bills.

While RGGI investments are just a small part of widespread clean and renewable energy investments in the region, together these actions are having measurable impact on the energy mix. Since 2005, RGGI states have increased their non-hydro renewable generation by 82 percent. In 2016 the RGGI states derived nearly half of total generation from clean or renewable sources.

GHG Abatement

GHG abatement is a broad category encompassing other ways of reducing greenhouse gases, apart from energy efficiency and clean and renewable energy. Approximately 11 percent of 2016 RGGI investments have funded GHG abatement programs in the region. Over their lifetime, the investments made in 2016 are expected to avoid the release of over 1.4 million short tons of harmful CO₂ pollution into the atmosphere (see **Table 4**).

Programs in the GHG abatement category may vary significantly, and may drive the reduction of GHG emissions in multiple sectors. For example, most RGGI-funded clean transportation and electric vehicle programs are tracked under the larger umbrella of GHG abatement. Technology research and development programs are tracked as GHG abatement, as they may lead to advancements resulting in the reduction of greenhouse gases. Climate change policy research is also tracked as GHG abatement.

GHG abatement programs vary in the types of benefits they provide. Some projects reduce electricity and fossil fuel use as part of their efforts to reduce overall emissions, generating economic benefits similar to those realized through energy efficiency and clean and renewable energy programs. Other projects may not return immediately trackable benefits within the scope of this report, but still provide important long-term benefits in climate preparedness and mitigation.

Table 4: Benefits of 2016 RGGI Investments in GHG Abatement

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	2,436	N/A
 Participating Businesses	159	N/A
 Short Tons CO ₂ Avoided	86,460	1.4 million
 Equiv. Cars Off Road	16,796	272,860
 MMBtu Saved	521,972	7.6 million
 Energy Bill Savings	\$35.3 million	\$411.4 million

Direct Bill Assistance

Direct bill assistance returns money to consumers as a rebate on their energy bills. Approximately 11 percent of 2016 RGGI investments have funded direct bill assistance. RGGI investments in direct bill assistance in 2016 have returned \$48.6 million in bill savings to energy consumers (see **Table 5**).

These programs provide rate relief to electricity consumers in the RGGI region. Some programs provide assistance specifically to low-income families, 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 support economic activity by providing funds directly to consumers, who can then spend those funds on other priorities. Unlike energy efficiency or clean energy programs (which generate benefits for the lifetime of the installed measures), direct bill assistance programs provide benefits only for the length of the bill-assistance program. Direct bill assistance programs also do not reduce or affect wholesale electricity prices. Finally, direct bill assistance programs do not directly reduce or offset fossil-fueled electricity use. Because of this, they tend to have lower lifetime economic and environmental benefits than other programs.

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.

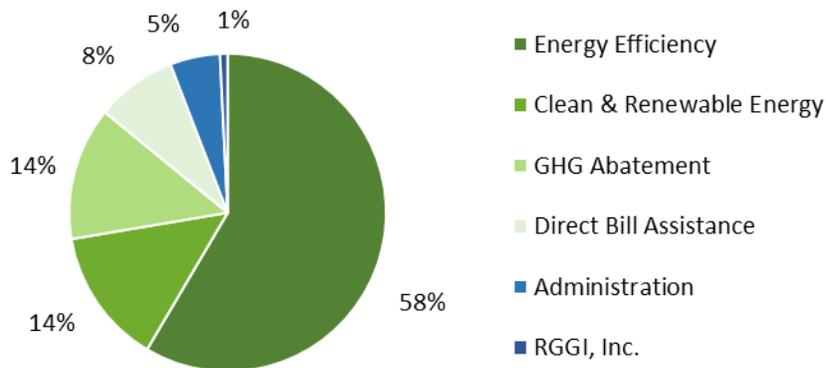
Table 5: 2016 RGGI Investments in Direct Bill Assistance

Category	Annual Benefits of 2016 Investments	Lifetime Benefits of 2016 Investments
 Participating Households	806,605	N/A
 Participating Businesses	109,220	N/A
 Energy Bill Savings	\$48.6 million	\$48.6 million

Cumulative Uses of Auction Proceeds

While this report's focus is primarily on 2016 data, information on cumulative RGGI investments is provided in this section as an overview of RGGI's complete track record. **Chart 4**, below, shows the percentage of all-time RGGI investments directed into each of the major program categories.

Chart 4: Cumulative RGGI Investments by Category



The nine participating RGGI states invested \$2.17 billion from the start of the program through 2016. \$245.1 million remained to be invested in 2017 and future programs. \$93.1 million was transferred to state general funds by acts of state legislatures.

This pie chart shows each program category as a percentage of all-time RGGI investments.

RGGI investments are themselves a subset of total proceeds. Most RGGI proceeds through 2016 are defined as RGGI investments. Other uses of funds, such as transfers to state general funds, are outside the scope of this report. See **Chart 5** on the next page for more details on total RGGI proceeds.

RGGI investments: This report estimates benefits, such as energy bill savings and short tons of CO₂ emissions avoided, which arise from RGGI investments. RGGI investments as defined within this report include investments in energy efficiency, clean and renewable energy, greenhouse gas abatement, and direct bill assistance, as well as administrative costs associated with these programs.

Future committed funds: Proceeds generated in a given year may not always be invested during the same year. A portion of cumulative proceeds generated through 2016 was not yet invested within the time period covered by this report. These funds are referred to as “future committed” funds. In many cases these funds are designated for specific programs, although in some cases they may be awaiting an investment plan.

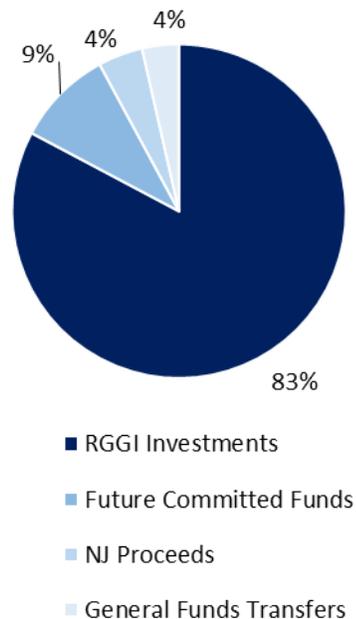
General fund transfers: In some cases proceeds have been transferred to state general funds by acts of state legislatures. Any benefits generated from the use of these proceeds are not within the scope of this report.

New Jersey proceeds: New Jersey participated in RGGI from 2009-2011. Any benefits generated from the use of RGGI proceeds in New Jersey are also not within the scope of this report.

Two states report program data according to the fiscal year (July 1 - June 30) rather than the calendar year. A fiscal year adjustment is used to compare numbers between fiscal-year and calendar-year states.

Chart 5: RGGI Investments as a Subset of Total Proceeds

Description	Funds
All Proceeds through Dec. 31, 2016	\$2,647,495,046.95
Adjustment for Fiscal Year Reporting	-\$28,430,754.94
New Jersey Proceeds	\$113,344,551.27
General Funds Transfers	\$93,100,000.00
Future Committed Funds	\$245,082,388.17
RGGI Investments	\$2,167,537,352.57



The pie chart shows four categories of funds, as a percentage of all proceeds **after** the fiscal year adjustment. The nine participating RGGI states invested \$2.17 billion in the period covered by this report. In 2009, \$90 million in NY proceeds were transferred to general funds as a deficit reduction measure. In 2010, \$3.1 million in NH proceeds were transferred to the state’s General Fund. NJ received \$113.3 million in proceeds from 2009-2011. This leaves \$245.1 million in funds which are yet to be invested.

All-time benefits metrics may be best understood as a general indication of the cumulative benefits of RGGI-funded investments since the program’s inception. **Table 6** shows that the track record from all RGGI investments includes benefits on the order of billions in customer bill savings, and tens of millions of short tons of CO₂ avoided. Note that as the program’s track record grows longer, all-time numbers may include changes in states’ methodologies from year to year.

Table 6: All-Time Benefits of RGGI Investments

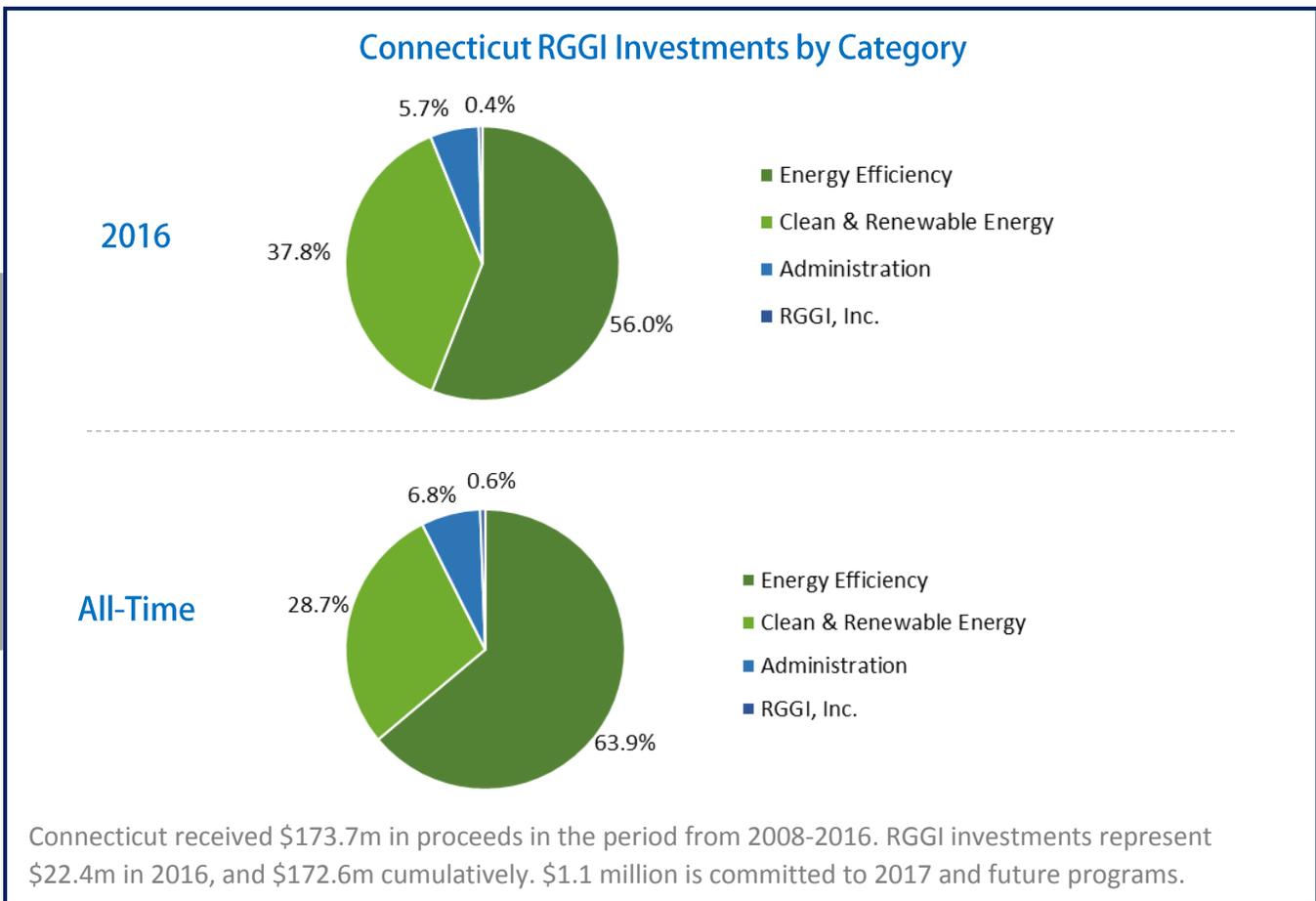
Category	Lifetime Benefits of All RGGI Investments
 Participating Households	1.3 million (Programs)
 Participating Businesses	26,565 (Programs)
 Workers Trained	8,150
 Short Tons CO ₂ Avoided	27.8 million
 Equiv. Cars off Road	5.4 million
 Megawatt-Hours Saved	34.9 million
 MMBtu Saved	137.5 million
 Energy Bill Savings	\$8.6 billion

Also note that previously reported cumulative benefits plus 2016 benefits may not sum exactly to updated cumulative benefits. This is due to state revisions or corrections to prior cumulative benefits calculations, which improve consistency and accuracy.

Connecticut

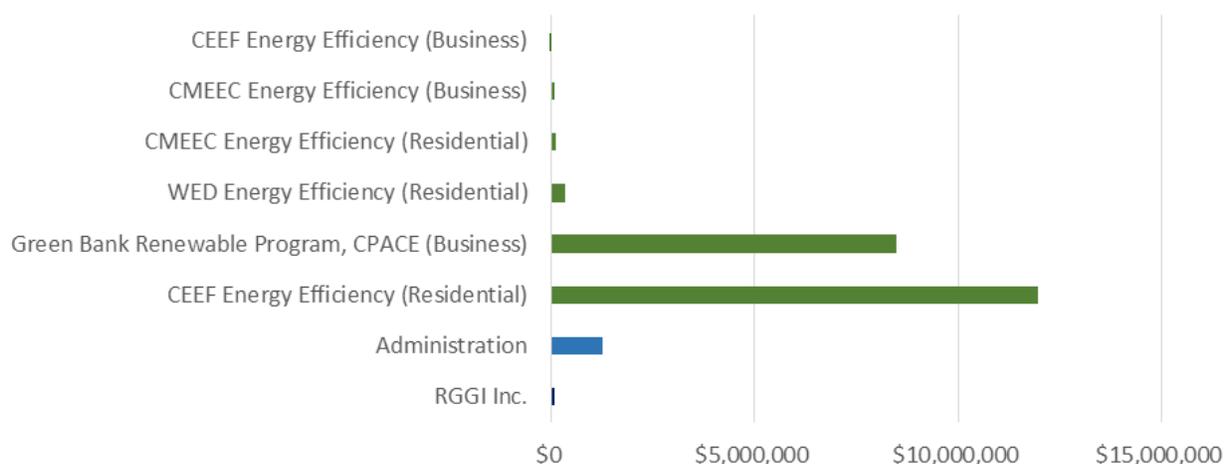
Connecticut invests the majority of its RGGI auction proceeds in programs and services dedicated to the deployment of energy efficiency measures and renewable energy technologies. Proceeds to support energy efficiency programs are distributed to the Connecticut Energy Efficiency Fund (CEEF), the Connecticut Municipal Electric Energy Cooperative (CMEEC), and the Town of Wallingford - Electric Division (WED). Proceeds to advance the development of Class I renewable energy sources are allocated to the Connecticut Green Bank (CT Green Bank).

The CEEF’s energy efficiency programs are administered by the electric distribution companies (Eversource, and The United Illuminating Company) and local gas distribution companies (Connecticut Natural Gas Corporation, Southern Connecticut Gas Company, and Yankee Gas Services Company) and marketed under the statewide brand, Energize ConnecticutSM.¹



¹ Funded chiefly by mandated conservation charges collected from electric and natural gas ratepayers, the CEEF supports a robust program portfolio designed to promote, encourage and enable adoption of energy-efficient technologies and behavior.

2016 Connecticut RGGI Investments by Recipient



Connecticut RGGI investments represent \$22.4m in 2016.

CEEF-supported programs provide energy audits under the Home Energy Solutions program, and offer rebates, instant discounts, and resources under the Retail Lighting, Heating, Cooling, Water Heaters, Appliances program. In addition, low-interest financing options are provided to builders, homeowners and businesses under the New Construction/Equipment and Small Business Energy Advantage programs. In 2016, RGGI proceeds were utilized to support these programs.

CMEEC is a joint action supply and transmission agency established by six of the state's municipal electric utilities (MEUs) (i.e., Bozrah Light and Power Company, Groton Utilities, Jewett City Department of Public Utilities, Norwich Public Utilities, South Norwalk Electric and Water, and Third Taxing District of Norwalk Electric Utility). Collectively, these six MEUs invested RGGI proceeds to conduct home energy audits, distribute efficient lighting products to residential customers, and implement equipment replacements and lighting retrofit projects for commercial and industrial facilities. During 2016, WED invested RGGI proceeds in home energy audits and energy efficiency and weatherization measures.

The CT Green Bank invests RGGI proceeds in low interest, no-money-down financing for clean and renewable energy projects under its Commercial Property Assessed Clean Energy (C-PACE) program. Since its 2013 inception, the program has, to date, used RGGI funds to help to finance a total of 72 completed projects, including 21 projects completed during 2016.

In the 2016 State Energy Efficiency Scorecard, the American Council for an Energy-Efficient Economy (ACEEE) ranked Connecticut 5th in the nation for the state's aggressive energy efficiency policies, including building codes, appliance standards, utility targets, and lead-by-example programs.

Program Highlight: Home Energy Savings Program

Through its Home Energy Savings program, WED provides energy audits and direct installation services to help residents become more energy efficient and save money on their utility bills. These services can involve the installation of LED light bulbs, blower door testing and air sealing, duct sealing, domestic hot water measures, and an evaluation of attic insulation levels. In addition, WED provides attic insulation rebates as an upgrade measure, covering up to 50% of the cost.

Success Story: 330 Blake Street Apartments, New Haven, CT

The 330 Blake Street Apartments is a 13-unit residential structure occupied by families with an average household size of three, most of which are of limited income. The building is electrically heated and tenants are responsible for paying their own utility bills. To improve the building's energy performance and create a more comfortable living environment for tenants, UI and New England Smart Energy (NESE), an authorized contractor participating in the Energize ConnecticutSM initiative, worked with the owner to perform a comprehensive energy assessment and evaluate opportunities for weatherization services and energy-efficient upgrades under the Home Energy Solutions - Income Eligible program.

NESE performed a variety of energy-saving measures including air sealing, hot water savings measures, lighting improvements, basement insulation, window replacements, and ducted heat pumps designed to provide both heating and cooling. These measures reduce the building's electric usage by an estimated 97,602 kWh annually, which amounts to an estimated \$17,568 in annual bill savings, and avoid an estimated 68.6 metric tons of CO₂ emissions each year. In total, this project received \$113,767 in incentives from UI.

"When the residents learned I was working with UI to help reduce their electric bills, they were very excited at the prospect of redirecting money spent on utility bills to things they find more valuable. Equally as important was the prospect of being more comfortable throughout the year—warmer in the winter and cooler in the summer with fantastic new heat pump systems. Participating in the Energize Connecticut initiative has provided an opportunity to create a more affordable, comfortable living environment for my tenants."

- Nick Mastrangelo, property owner



The 330 Blake Street Apartments.
Photo courtesy of CT DEEP.

Resources:

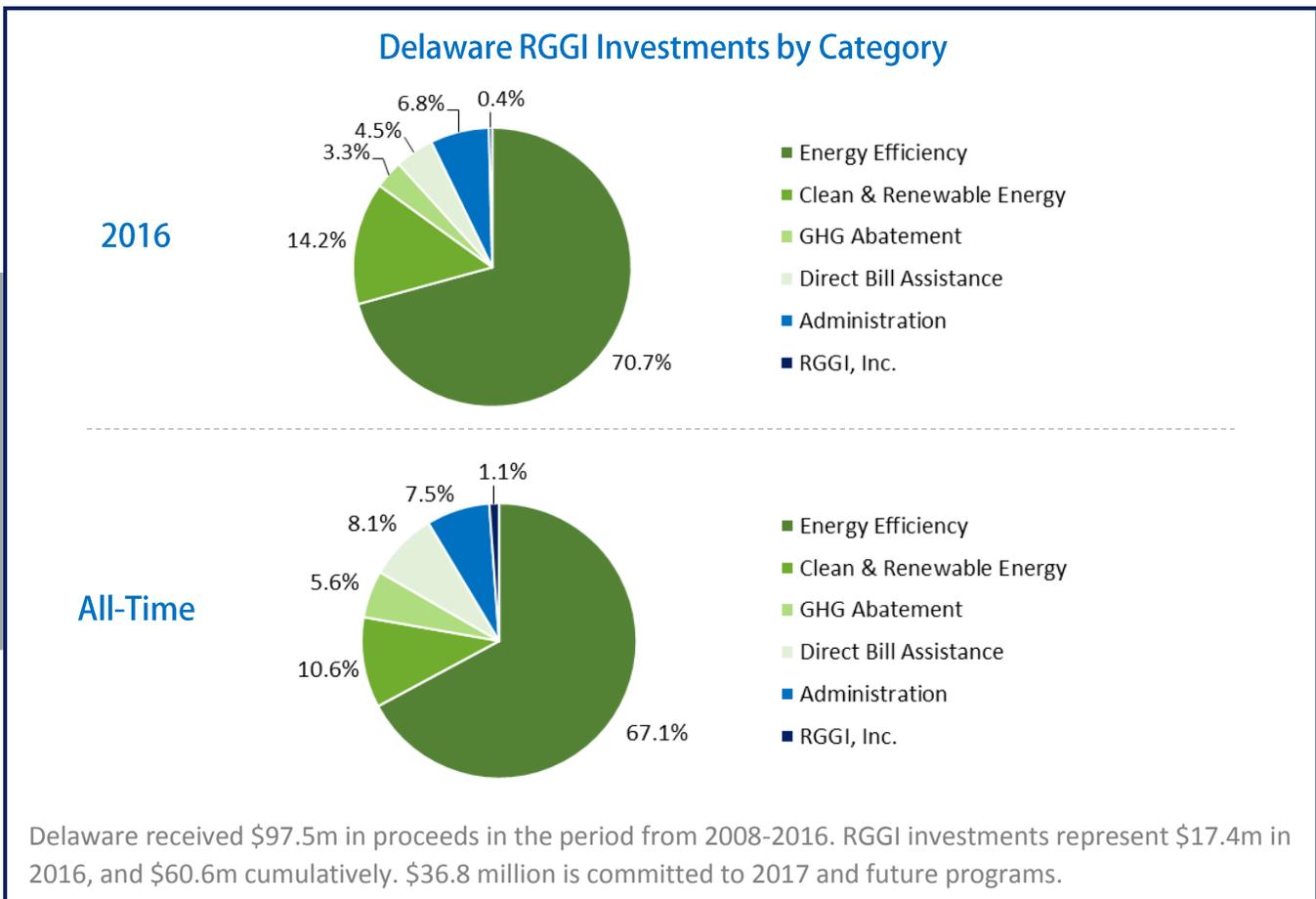
- [Connecticut Energy Efficiency Fund 2016 Report](#)
- [Energize Connecticut](#)
- [Home Energy Savings Program \(Town of Wallingford - Electric Division\)](#)
- [C-PACE](#)

Delaware

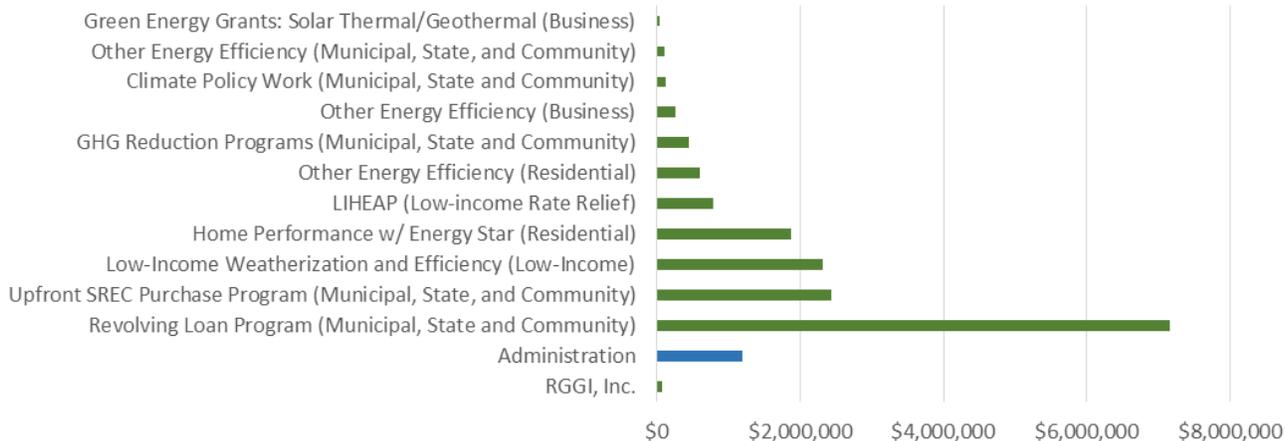
Delaware invests RGGI allowance proceeds in a variety of programs that reduce energy use, reduce greenhouse gas emissions, and assist low-income families with energy bill payments. The suite of programs funded with RGGI allowance proceeds provides Delaware families and businesses with valuable assistance with energy efficiency improvements, while providing opportunities for innovation in greenhouse gas reductions.

Delaware directs 65 percent of its allowance proceeds to the Delaware Sustainable Energy Utility (SEU). The SEU serves Delawareans by promoting the use of affordable, reliable, clean energy and providing a variety of incentives for energy efficiency improvements. In 2016, the SEU continued its successful programs including its Energize Delaware Revolving Loan Fund, Home Performance Program, Solar Renewable Energy Credit Upfront Purchase Program, and Energy Savings Performance Contracting Program. In addition, it launched two new programs for low and moderate income families designed to expand their access to energy efficiency services.

Delaware directs 10 percent of its allowance proceeds to the Delaware Department of Natural Resources and Environmental Control (DNREC) for development of innovative programs to reduce greenhouse gas emissions. In 2016, these funds were utilized to continue the Clean Transportation Rebate Program and launch an Alternative Fueling Infrastructure Grant Program.



2016 Delaware RGGI Investments by Recipient



Delaware RGGI investments represent \$17.4m in 2016.

Ten percent of proceeds is also directed to DNREC to implement the state's Weatherization Assistance Program which provides no-cost upgrades to homes to decrease energy use and decrease bills. Five percent of proceeds is also directed to the Low-Income Home Energy Assistance Program to reduce energy bills for low-income customers.

Ten percent of RGGI proceeds are directed to administration of Delaware's RGGI program, which includes program and policy development, education, and reporting.

Program Highlight: Energize Delaware Revolving Loan Fund

The Energize Delaware Revolving Loan Fund, administered by the Delaware Sustainable Energy Utility, provides low interest loans to encourage the installation of end-user energy efficiency and customer-sited renewable generation and greenhouse gas reduction measures. The loans are structured to be cash positive from day one, eliminating the financial risk of making recommended energy efficiency upgrades. In order to qualify for funding, savings over the life of the project must be greater than the financing investment. The program is available to businesses, non-profits, school districts and local governments. In 2016, the program closed six loans totaling \$7.1M.

Success Story: Lewes Library Solar Project

The City of Lewes Public Library Board wanted to make their new library “green.” To do it, they worked with the Delaware Sustainable Energy Utility and received a low-interest loan through the Energize Delaware Revolving Loan Fund. They financed solar panels, LED lighting and a highly efficient Variable Refrigerant Flow HVAC system through a \$415,000, ten-year loan. The estimated annual energy savings from these measures is \$47,500. This loan helped the library leverage their funding in the best way possible, providing flexibility and long term savings that can be utilized for books and programs rather than energy costs.



The Lewes Library with panels on its roof. Photo courtesy of DNREC.

Resources:

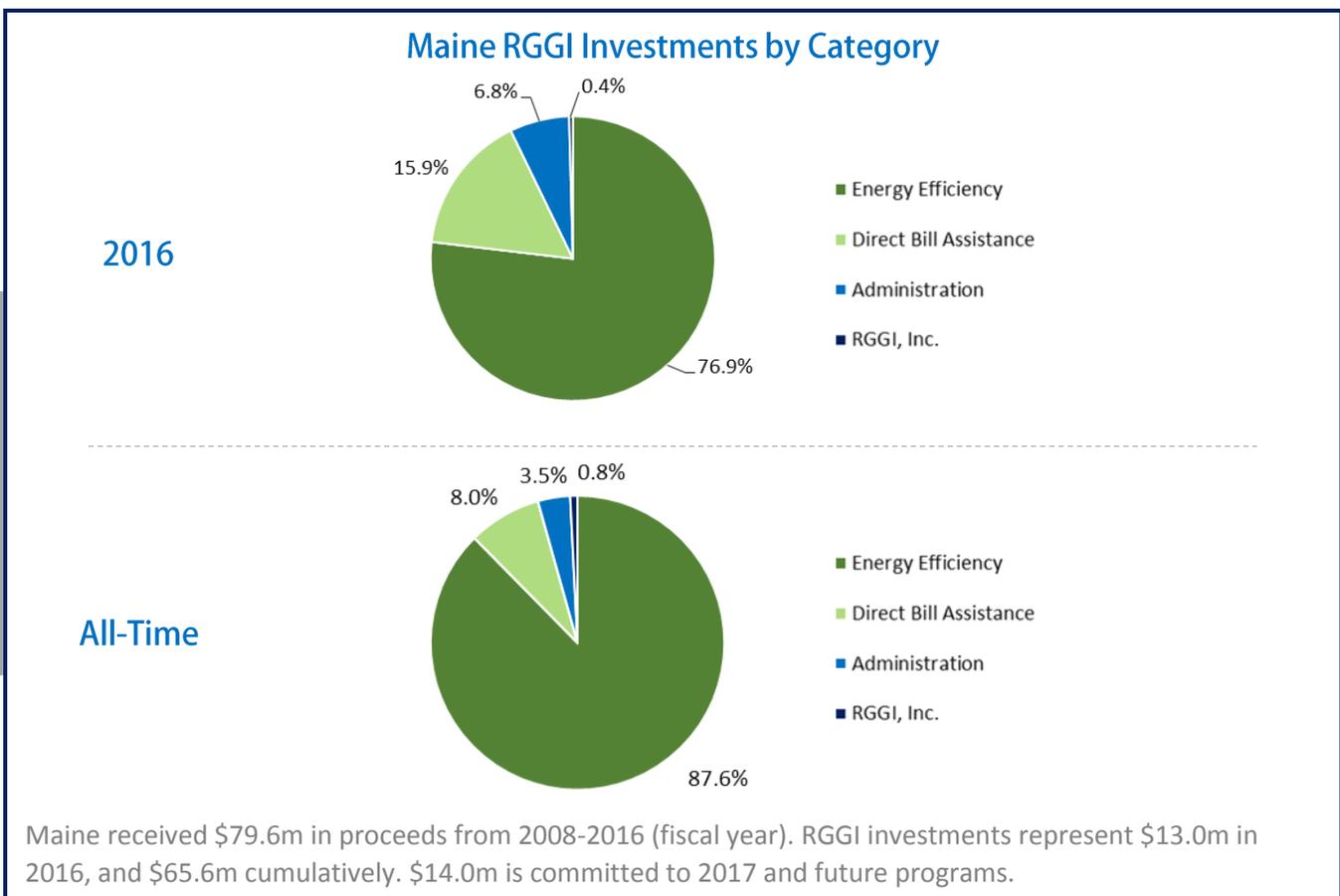
- [Delaware SEU](#)
- [Weatherization](#)
- [Delaware Clean Transportation Incentive Program](#)
- [Energize Delaware Revolving Loan Fund](#)

Maine

The Efficiency Maine Trust (Efficiency Maine) is the independent, third-party administrator for energy efficiency programs in Maine. The organization’s purposes include the following:

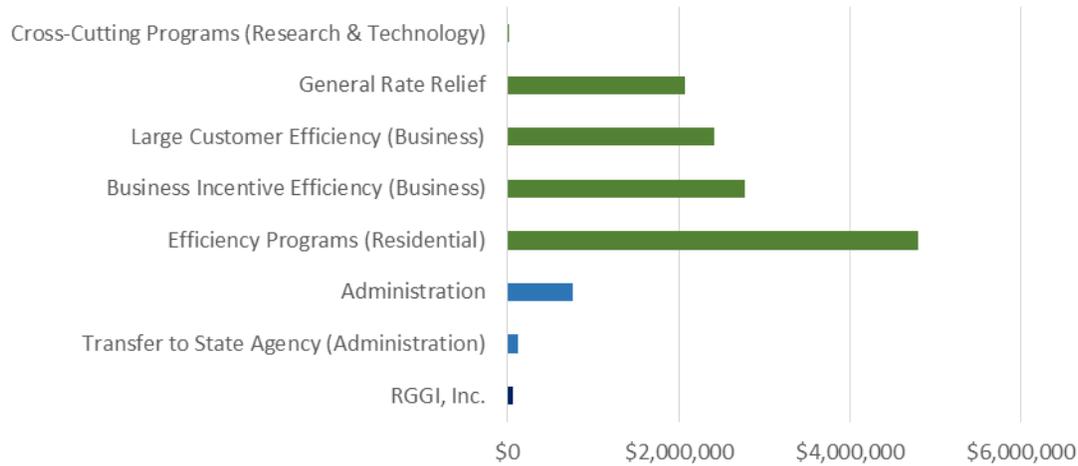
- Provide uniform, integrated planning, program design and administration of programs;
- Reduce energy costs and improve security of the state and local economies;
- Administer cost-effective energy and energy efficiency programs to help individuals and businesses meet their energy needs at the lowest cost;
- Ensure that all expenditures of the trust are cost-effective in terms of avoided energy costs; and
- Actively promote investment in cost-effective energy and energy efficiency measures and systems that use alternative energy resources that reduce overall energy costs for consumers in the State.

Over the lifetime of the investments made in FY2016, Maine’s RGGI-funded efficiency measures are estimated to generate savings of over 157,000 MWh in avoided electricity use and another 3.6 million MMBtu in avoided consumption of natural gas and other heating or process fuels. These investments will lower participants’ energy bills by more than \$69 million.²



² In FY2016 Efficiency Maine applied a 2.43% real discount rate across all programs’ lifetime bill savings.

2016 Maine RGGI Investments by Recipient



Maine RGGI investments represent \$13.0 million in 2016.

In order to develop and administer programs that will help meet Maine’s energy needs at the lowest cost and improve its economic security, the statute identifies several goals for the Trust to pursue, including:

- Reducing the cost of energy to residents of the State.
- Maximizing the use of cost-effective weatherization and energy efficiency measures.
- Reducing economic insecurity from overdependence on price-volatile fossil fuels
- Enhancing heating improvements for households of all income levels through implementation of cost-effective efficiency programs that will produce comfort, improve indoor air quality, reduce energy costs, and reduce the need for future fuel assistance.
- Simplifying and enhancing consumer access to technical assistance and financial incentives by merging or coordinating dispersed programs under a single administrative unit.
- Using cost-effective energy and energy efficiency investments to reduce GHG emissions.

Efficiency Maine’s programs are funded primarily by a combination of electric and natural gas system benefit charges, Forward Capacity Market proceeds, and RGGI proceeds. During its 2016 fiscal year (FY2016), Efficiency Maine invested over \$13 million in RGGI proceeds, directing approximately 93% towards a combination of energy efficiency programs and direct bill assistance; the remaining 7% went toward general administration. Though nearly all of Efficiency Maine’s programs leveraged RGGI funding to some degree in FY 2016, the bulk of funds were invested in the following three programs:

- Home Energy Savings Program: Drove market-based home weatherization and heating demand reduction by offering rebates and loans, educating customers, and developing a vendor network.
- Commercial and Industrial (C&I) Prescriptive Program: Provided fixed-price incentives for a prescriptive suite of “off-the-shelf” energy efficiency measures for C&I customers.
- C&I Custom Program: Targeted larger C&I customers by offering incentives for custom, site-specific energy efficiency projects that require unique engineering analyses.

Program Highlight: Home Energy Savings Program

Efficiency Maine's Home Energy Savings Program (HESP) serves as the framework for market-based residential weatherization and heating system improvements achieved through a combination of rebates, financing, and customer education. HESP raises awareness about the benefits of home weatherization and encouraged Maine homeowners to make energy efficiency upgrades. Following the statutory requirements set forth in the 2013 the Omnibus Energy Bill, Efficiency Maine invested a portion of the available RGGI auction revenues on measures meant to reduce home heating demand. This change allowed Efficiency Maine to expand its funding for projects that save heating oil, Maine's most common home heating fuel, and lower greenhouse gases without relying on federal funds. In FY2016, \$4,802,946 of RGGI funds was invested through HESP, constituting approximately 48% of the total HESP budget. HESP provided more than 7,900 participants with rebates for energy-saving measures in FY2016, including more than 4,800 mini-split, ductless, cold-climate heat pumps. There was also significant interest in pellet boilers with 177 installed in Maine homes over the course of the program year. Through these incentives, Efficiency Maine was able to facilitate close to \$18 million in private energy efficiency investments. In FY2016, HESP continued to offer loans to finance qualifying home energy upgrades. Smaller, unsecured loans have continued to increase in popularity, as they require less paperwork and can be processed more quickly than the other loan products. By the end of FY2016, unsecured loans accounted for 80% of the loans administered by Efficiency Maine. The average amount financed was approximately \$8,400.

Success Story: Hannaford Supermarket Heat Recovery Project

In early 2017, Hannaford decided to replace five rooftop units (RTUs) that provide heating and cooling for its York supermarket location. The original project included an option to supplement these RTUs with glycol-based full condensing heat recovery equipment; this would allow the system to capture wasted energy from condensing refrigerant gas and use it to offset the store's space heating requirements. When this design feature was removed from the proposed project scope to due capital budget constraints, Hannaford's energy management team reached out to Efficiency Maine to see if it could help. Given the complex, site-specific nature of the project, Hannaford worked with Efficiency Maine's Commercial and Industrial (C&I) Custom Program. The program was able to offer a \$55,178 incentive on the \$199,342 project. By defraying the upfront capital cost, Efficiency Maine's award helped convince the company to move forward with the supplementary energy efficiency measures; the incentive brought the simple payback period down from 5.1 years to 2.7 years. This investment will save Hannaford approximately 3,140 MMBtu of propane annually, reduce the company's operating costs for years to come. As it does with its other programs, Efficiency Maine typically reserves RGGI funding in the C&I Custom Program for projects that save unregulated fuels (e.g., oil, propane, kerosene, wood, etc.). Because the Hannaford project resulted in propane savings, it was funded entirely with RGGI dollars.

Resources:

- [Efficiency Maine Home Energy Savings Program](#)
- [Efficiency Maine Low-Income Options](#)

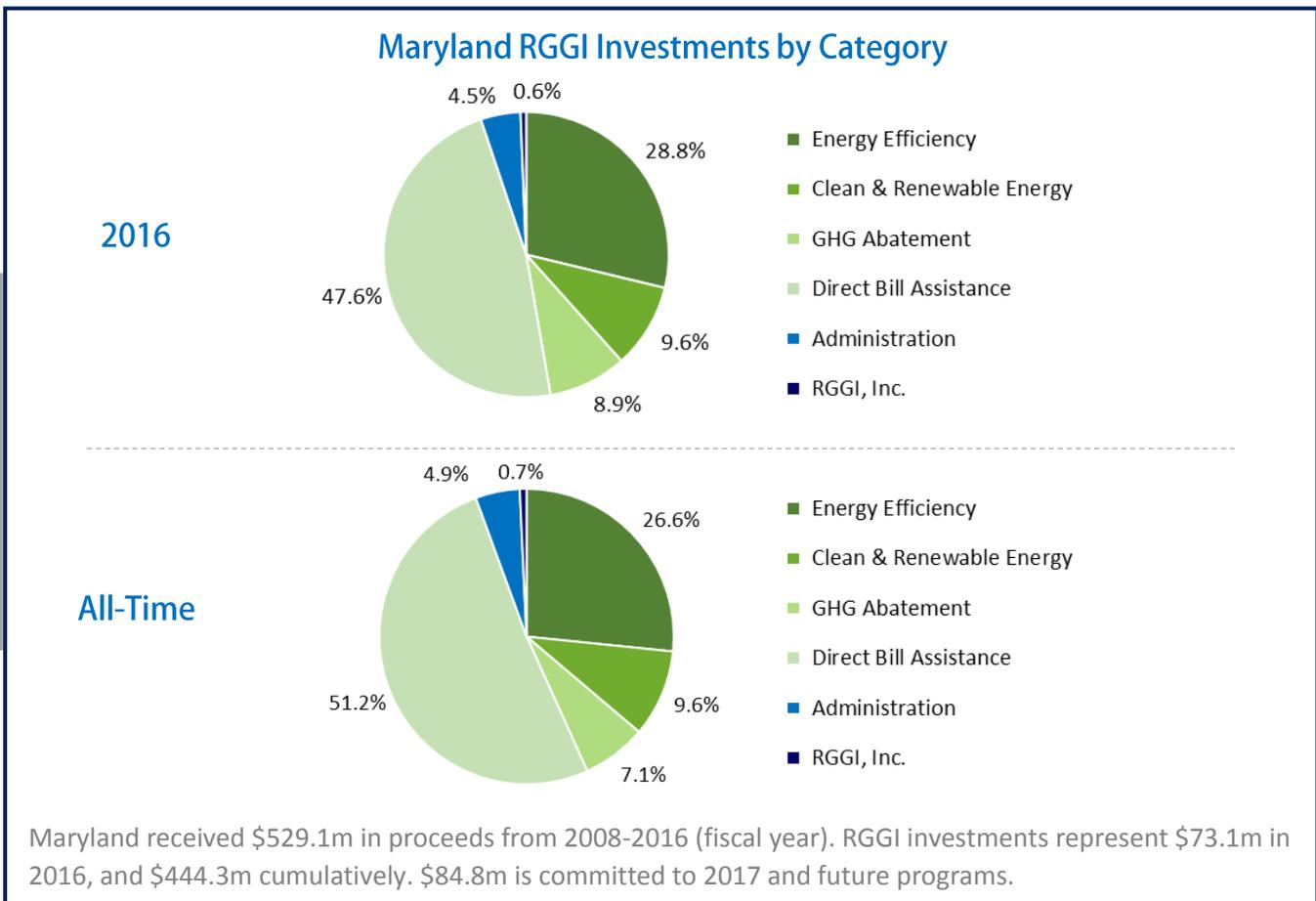


Jim Boyko of Boyko Engineering (L), Paul Czarnionka of Hannaford (C), and Richard Doughty of Efficiency Maine (R) point to the new glycol loop. Photo courtesy of Efficiency Maine.

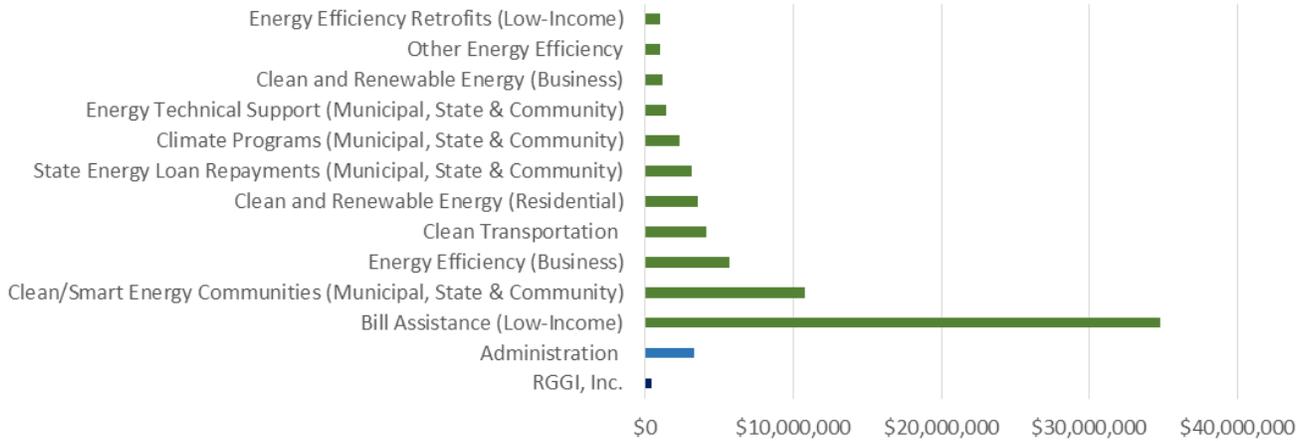
Maryland

Maryland allocates proceeds from the sale of CO₂ allowances into the State's Strategic Energy Investment Fund (SEIF)—a special, non-lapsing fund administered by the Maryland Energy Administration (MEA).

MEA deploys SEIF funds to promote affordable, reliable, and clean energy across all of Maryland's diverse regions and communities. These programs are intended to reduce household bills, create new jobs in growing industries, and promote energy independence. The programs also have reduced significantly the energy costs of Maryland's businesses.



2016 Maryland RGGI Investments by Recipient



Maryland RGGI investments represent \$73.1 million in 2016.

Program Highlight: Combined Heat and Power Grant Program

The Combined Heat and Power (CHP) Grant Program is designed to further encourage CHP growth in the State. This first come, first served program targets eligible commercial, industrial, institutional, and critical infrastructure facilities (including healthcare, wastewater treatment, and essential state and local government facilities).

CHP systems generate electricity and useful thermal energy in a single, integrated system. CHP options combine technologies to maximize energy efficiency and reduce waste. In traditional fossil fuel power plants, two-thirds of the energy used to generate electricity is wasted in the form of heat discharged to the atmosphere as well as through electricity transmission, achieving a combined efficiency of only 33 percent. By combining electricity generation and waste heat capture, CHP systems can operate at levels as high as 80 percent efficiency.

FY16 Results:

- MEA issued 10 awards for over \$4 million
- Total project costs over \$48 million
- 16.5 MW of CHP capacity installed



Governor Hogan and Team MEA in front of the PRMC CHP units. Photo courtesy of MEA.

Success Story: Peninsula Regional Medical Center and Combined Heat and Power

The Peninsula Regional Medical Center (PRMC) recently installed a new CHP system that makes its operations more efficient and environmentally friendly. The project was funded in part by a \$494,320.00 CHP grant from the Maryland Energy Administration, with additional support from Unison Energy, Delmarva Power, and its parent company, Pepco Holdings, Inc. PRMC is the Eastern Shore's largest, most advanced tertiary care facility, with 3,300 physicians, staff, and volunteers that provide care to nearly 500,000 patients.

PRMC's new system is composed of natural gas fired reciprocating internal combustion engines, and recovered waste heat will be used to provide space heating and domestic hot water. This new CHP system is expected to have an annual generation of over 26 million kilowatt hours, providing a projected annual electric cost savings of \$415,086. Additionally, the projected annual natural gas costs savings will total \$324,705. This energy efficiency project will see a payback in just over 7 years.

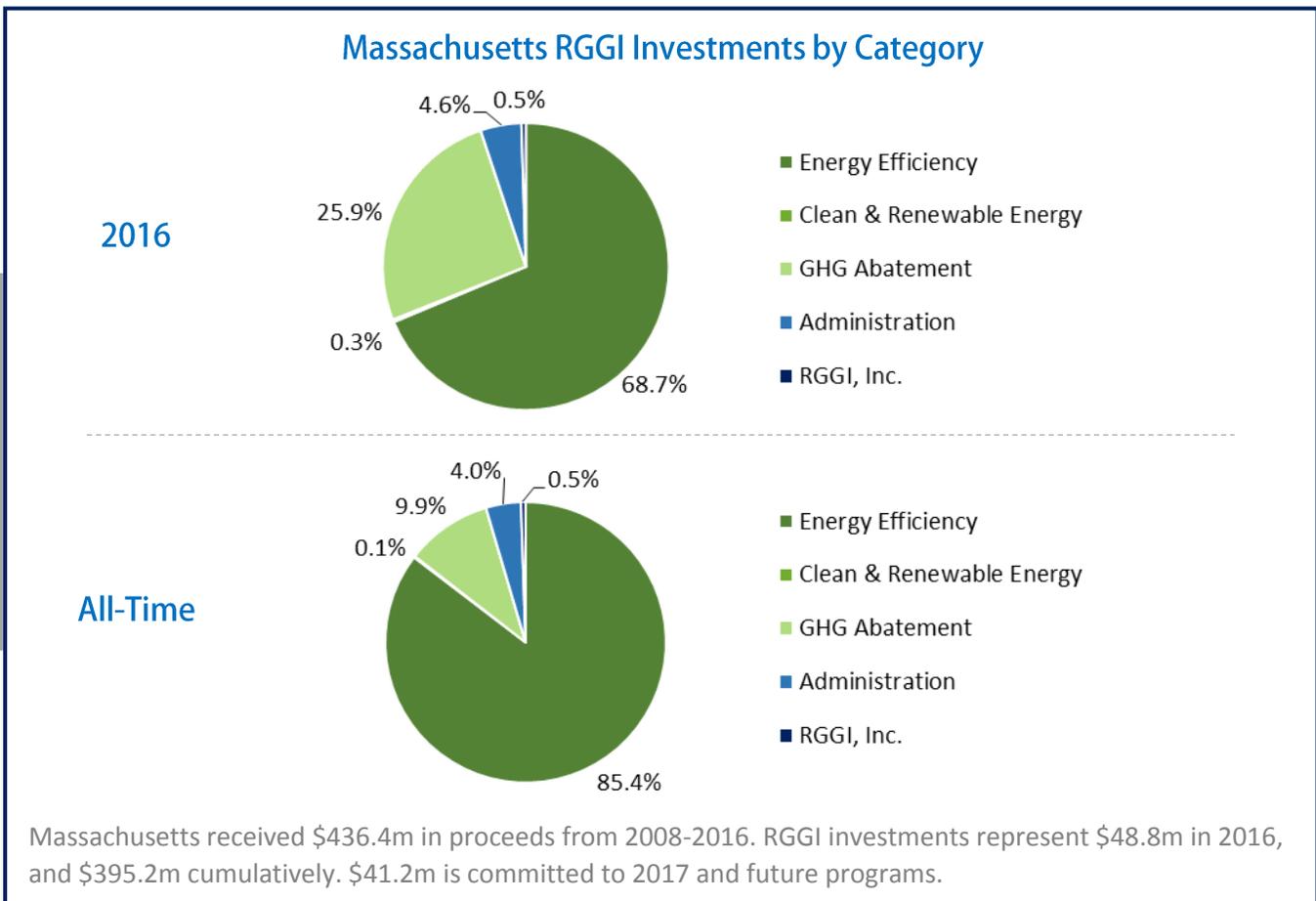
PRMC's CHP system will offset 81% of the annual energy consumption and cut their carbon footprint drastically, with an annual CO2 reduction of more than 50%.

Resources:

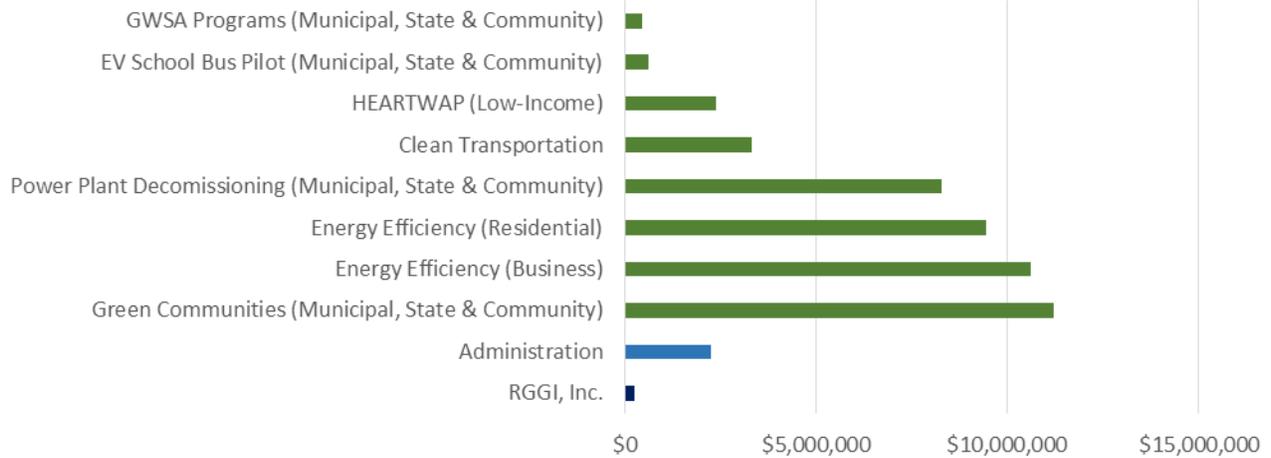
- [Maryland Energy Administration](#)
- [Maryland Energy Administration Incentives](#)
- [Maryland Energy Administration Success Stories](#)

Massachusetts

Massachusetts has put its RGGI allowance proceeds to work advancing the Commonwealth's energy goals. Since 2008, Massachusetts has invested more than \$395 million in RGGI proceeds towards strategic energy programs and initiatives. Massachusetts has invested the majority of its RGGI funds in energy efficiency through the Massachusetts' statewide Three-Year Energy Efficiency Investment Plans and other State programs managed by the Department of Energy Resources such as the Green Communities Designation and Grant Program. After administrative costs and required funding to communities that experienced fossil fuel plant closures are allocated, 80% of remaining proceeds (net funding) are allocated to the statewide Energy Efficiency Investment Plans implemented through the Commonwealth's investor-owned utilities under the Mass Save® brand to deliver cost-effective energy savings to Massachusetts residences and businesses. The Commonwealth's nation-leading energy efficiency programs are also funded through the state's Energy Efficiency Reconciliation Factor (EERF), system benefit charges, and regional forward capacity market auction proceeds. The remaining 20% of net funding has been used for Massachusetts' Green Communities to implement clean energy projects including energy efficiency improvements, classified as energy efficiency below, or more recently for incentive programs for electric and plug-in hybrid vehicles, classified as GHG abatement below.



2016 Massachusetts RGGI Investments by Recipient



Massachusetts RGGI investments represent \$48.8 million in 2016.

Program Highlight: Massachusetts Offers Rebates for Electric Vehicles (MOR-EV)

MOR-EV, a consumer rebate and awareness raising program, uses RGGI funds to promote the use of zero-emission vehicles (ZEVs) by offering rebates of up to \$2,500, and by increasing consumer and dealer awareness of battery electric, plug-in hybrid electric and fuel cell electric vehicles. The program is in support of Massachusetts' goal to reach 300,000 ZEVs on the roads by 2025. MOR-EV has been funded by RGGI since its launch in 2014.

Rebated ZEVs provide accumulating benefits well beyond their first year on the road. Benefits from new purchases in year one repeat each subsequent year and are increased with new additions. Just over \$3MM was paid towards 1,569 vehicle rebates in 2016, and over the program's lifetime through the end of 2016, \$6.7MM has helped fund a total of 3,114 ZEVs. This RGGI-funded program has provided Massachusetts substantial savings, both environmentally as well as economically.

GHG avoidance for new purchases rebated in 2016 was 5,650 short tons. The annual 2016, avoided GHG emissions from all program rebated vehicles were in excess of 11,000 short tons. The cumulative MOR-EV program emissions savings was 18,555 short tons by the end of 2016. Lifetime GHG reduction



A display for the MOR-EV program.
Photo courtesy of MA DOER.

for 2016 acquired vehicles will be an estimated 84,865 short tons, while lifetime avoided emissions for all MOR-EV vehicles rebated by the end of 2016 is estimated to be near 167,000 short tons.

	GHG Savings in Year of Purchase	Annual GHG Savings of Cumulative Rebated Vehicles On The Road	Cumulative Program GHG Savings of MOR-EV	Projected Lifetime GHG Savings of MOR-EV Program (15 year vehicle life)
2014	1,940	1,940	1,940	29,094
2015	3,539	5,479	7,419	53,090
2016	5,658	11,137	18,555	84,864

Accounting for fuel savings, operating cost savings and petroleum, GHG and air pollutant externality savings, the 2016 purchased MOR-EV vehicles saved \$2.8MM in the initial year of purchase. All vehicles rebated during the life of the program collectively saved almost \$5.5MM in 2016. The cumulative program savings was more than \$9.1MM at the close of 2016. Lifetime savings for 2016 purchases will approach \$42MM and lifetime savings for all MOR-EV cars rebated between 2014 and 2016 is estimated to be greater than \$82MM.

	\$ Savings in Year of Purchase	Annual \$ Savings of All MOR-EV Vehicles On The Road	Cumulative Program \$ Savings of MOR-EV	Projected Lifetime \$ Savings for Annual Purchases (15 year vehicle life)
2014	\$935,450	\$935,450	\$935,450	\$14,031,750
2015	\$1,747,400	\$2,682,850	\$3,618,300	\$26,211,000
2016	\$2,799,430	\$5,482,280	\$9,100,580	\$41,991,450

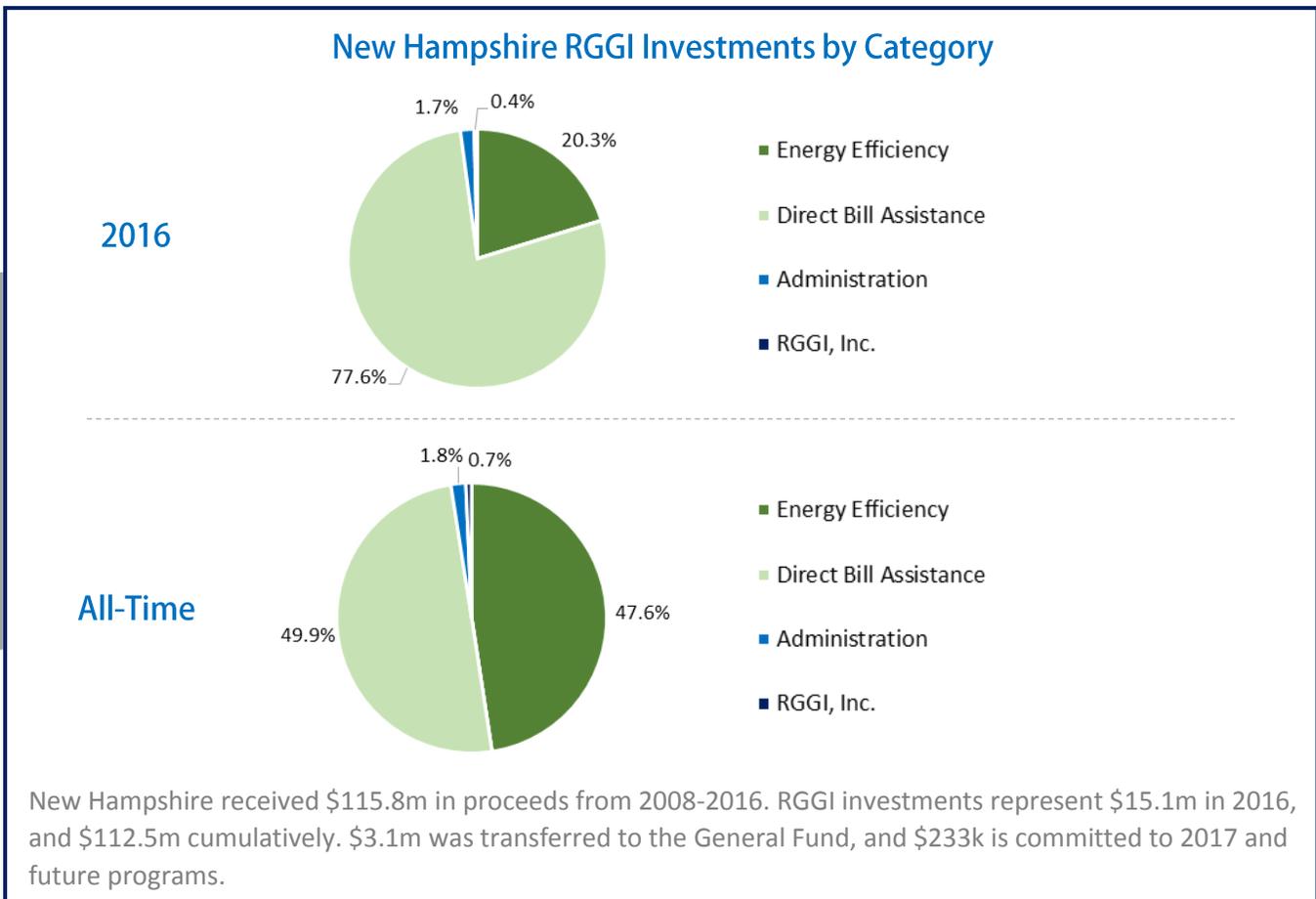
Resources:

- [MOR-EV](#)
- [Alternative Fuel Life-Cycle Environmental and Economic Transportation \(AFLEET\) Tool](#)

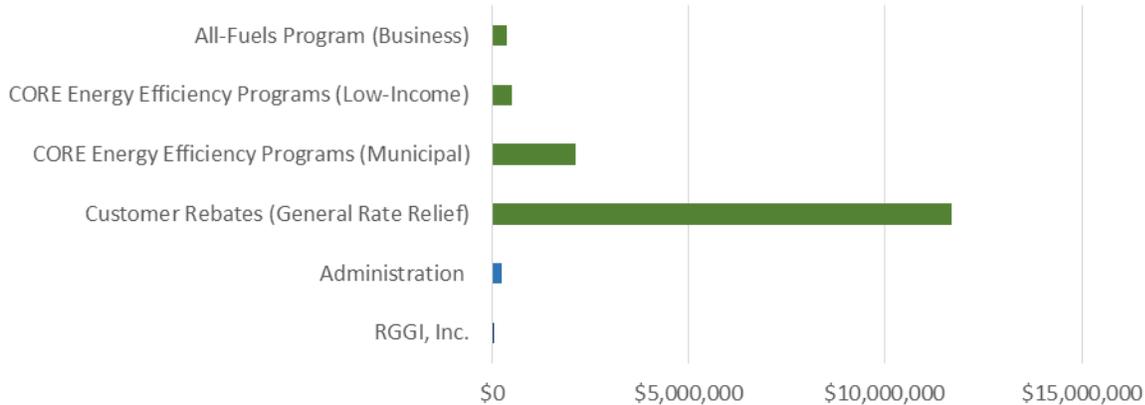
New Hampshire

In 2016, New Hampshire received approximately \$15.1 million in RGGI allowance proceeds. New Hampshire invested approximately \$3.1 million to its Energy Efficiency Fund, which in conjunction with the System Benefits Charge, funds energy efficiency programs administered by the state’s four electric utility companies. Of the \$15.1 million, approximately \$11.7 million was used to provide direct bill assistance to New Hampshire electric consumers. The remaining auction proceeds of \$0.3 million covered administrative expenses and RGGI, Inc. expenses. With respect to funds available for energy efficiency programs, the following results were accomplished in 2016:

- Weatherized 90 income-eligible homes through the Home Energy Assistance program;
- Upgraded to highly efficient equipment in 135 municipalities through the Municipal program;
- Financed 31 residential energy efficiency projects utilizing consumer loans from the RGGI-funded revolving loan fund; and
- Hosted workshops throughout the state to educate code officials, home builders, home buyers, realtors and more on the energy code.



2016 New Hampshire RGGI Investments by Recipient



New Hampshire RGGI investments represent \$15.1 million in 2016.

The energy efficiency programs administered by the state's electric utility companies include a Municipal program, an income-eligible Home Energy Assistance program and an All-Fuels program.

With respect to the Home Energy Assistance program and the Municipal program, these programs will save approximately 79,884,000 kWh of electricity and 164,936 MMBtus over the expected life of the efficient equipment improvements. Associated bill savings over the lifetime of these improvements is estimated to be approximately \$16.5 million.⁴

The vendor selection process for the All-Fuels program was completed in November 2015 and the program was launched in early 2016. The program spans three years (2016-2018) and the estimated RGGI funding for this three-year period is \$1.2 million.

Consumer financing continues via the RGGI-funded revolving loan fund which was originally funded through a RGGI grant awarded to the state's electric utility companies in 2009. The revolving loan fund continues to offer zero interest loans and fixed monthly loan repayment on customer bills. Through its revolving nature, as loans are repaid, funds become available for new loans. In 2016, there were 31 residential projects financed utilizing these funds, with an average loan amount of approximately \$1,600.

Program Highlight: Energy Efficient Investments in Public Schools

RSA 374-F:4, VIII-a requires that the electric utilities submit plans for program design, and/or enhancements, and estimated participation that maximize energy efficiency benefits to public schools, including measures to enhance the energy efficiency of public school construction or renovation projects that are designed to improve indoor air quality. In 2016, the measures that were installed in public schools included: cooling, energy management systems, heating, lighting, lighting controls, motors, parking lot lights, process, refrigeration and weatherization.

⁴ Total estimated savings of \$16.5 million are split between electric kWh savings of \$12.8 million and \$3.7 million for fossil MMBtu savings.

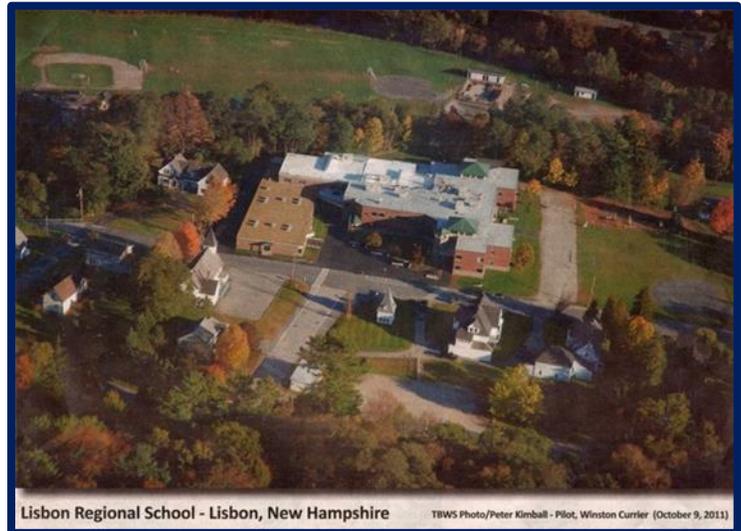
Approximately \$1.0 million was invested in New Hampshire public schools in 2016, with funding provided by RGGI allowance proceeds, in conjunction with funding provided by the System Benefit Charge. These projects resulted in annual savings of 3,237,494 kWh and 5,492 MMBtu.

Success Story: Lisbon Regional School District

School kids in Lisbon, New Hampshire had brighter and warmer classrooms this winter thanks to significant investments in energy efficiency projects. Through the energy efficiency program, Lisbon Regional School District completed a number of projects to improve lighting, comfort and energy losses.

The school was awarded a rebate of \$94,850 for the work, which included air sealing with spray foam, a retrofit of all existing interior and exterior lighting to energy-efficient LEDs, and new controls for the HVAC system. It's estimated the improvements will add up to savings of 172,352 kilowatt hours, and 8,714 gallons of oil a year.

In addition to qualifying for rebates, the Lisbon Regional School District utilized a performance contract to manage the project through a single contractor and guarantee energy savings. The performance contract was paired with a 3% loan for \$393,150. The performance contract guarantees \$35,000 in annual energy savings and the loan is structured so that the annual savings exceeds the annual loan payments.



Resources:

- [CORE Energy Efficiency Programs](#)
- [CORE Energy Efficiency Programs 4th Quarter 2016 Report](#)
- [Results and Effectiveness of the System Benefits Charge, Annual Report](#)

New York

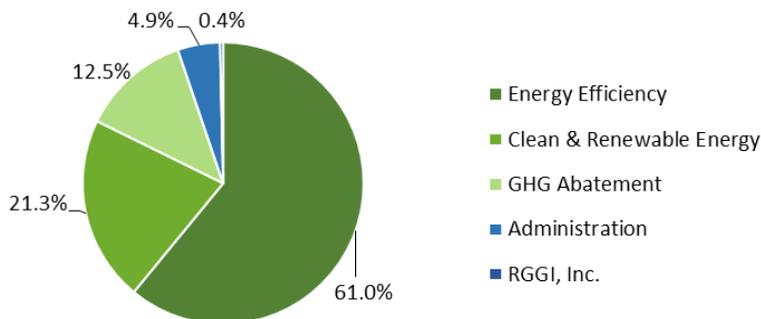
New York’s leadership helped to establish RGGI as North America’s first mandatory market-based program to reduce carbon emissions. New York is building off of the success of RGGI through its nation-leading Clean Energy Standard and the ten-year, \$5 billion Clean Energy Fund to achieve its ambitious economy-wide goal to reduce greenhouse gas emissions 40% from 1990 levels by 2030, on a path to an 80% reduction by 2050. These complementary state strategies work under the regional cap established by the RGGI states, all of which support decarbonization of New York’s electricity sector (see graphic below). RGGI investments help to fill gaps or pursue specific opportunities for clean energy, energy efficiency, and carbon reduction that other state activities are not currently designed to reach.

New York’s RGGI investments have fostered shifts in clean energy technologies. As an example, RGGI supported the growth of Long Island’s residential solar market to the point of self-sufficiency, the first market in the state to reach this milestone. The second round of NY-Sun’s Solarize program resulted in approximately 600 new solar installations across 23 counties, with a third round of additional Solarize campaigns announced toward the end of 2016.

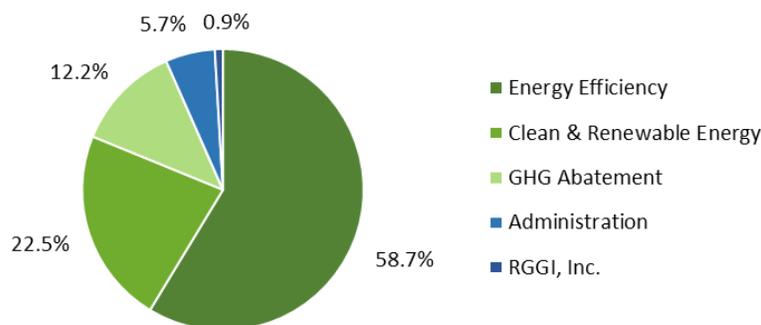


New York RGGI Investments by Category

2016

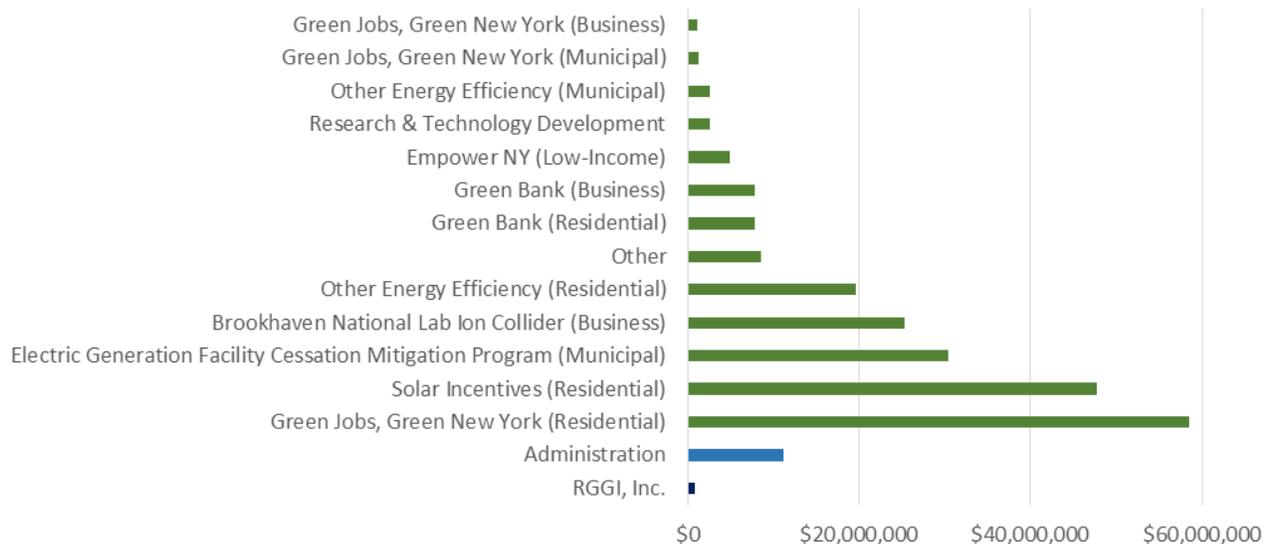


All-Time



New York received \$997.7m in proceeds from 2008-2016. RGGI investments represent \$229.7m in 2016, and \$862.7m cumulatively. \$90m was transferred to general fund, and \$44.9m is committed to future programs.

2016 New York RGGI Investments by Recipient



New York RGGI investments represent \$229.7 million in 2016.

The success of the NY-Sun program on Long Island and continued, robust interest in the Solarize program underscore the State's investment strategy success in building interest and generating projects to reduce New York's carbon footprint.

Similar momentum has been realized by investment strategies focused on community-oriented programs. RGGI investments supported the launch of NYSERDA's Clean Energy Communities program in 2016. New York communities are eagerly completing four of the ten clean energy High Impact Actions to receive the Clean Energy Community designation and eligibility for grant funding. RGGI has also supported the State's Climate Smart Communities program. Over 200 communities representing one third of the State's population have committed to act on climate change by taking the Climate Smart Communities Pledge.

The growth in clean energy opportunities must be met with a skilled workforce. New York has focused RGGI investments in a Clean Energy Workforce Opportunity program, which will train the next generation of New Yorkers. And the RGGI-supported REV Campus Challenge is looking to energize college students to take clean energy action on campus, and orient them to career opportunities in the state's burgeoning clean energy economy. Through these and other initiatives, New York has been able to develop a more comprehensive investment portfolio. Because of participation in RGGI, New York has also been able to accelerate progress toward the State's clean energy and climate goals and commitment to uphold the Paris Agreement.

Program Highlight: REV Campus Challenge

RGGI helps New York to catalyze and sustain long-term support for advancing climate-focused solutions by the state's higher education institutions. The REV Campus Challenge promotes clean energy and climate efforts by recognizing and supporting colleges and universities in New York State that implement clean energy projects and principles on campus, in the classroom, and in surrounding communities. Institutions voluntarily enroll by selecting a designation based on a self-assessment of their progress to-date in advancing clean energy and greenhouse gas reduction strategies. The designation indicates the

level of support, including technical assistance and planning, they wish to receive through the program in support of their goals. By engaging at the collegiate level, this program builds interest in and support for clean energy and climate solutions with the next generation of New Yorkers. As part of the program, the state launched the Energy to Lead Competition to challenge colleges and student-led coalitions to develop and implement plans to advance clean energy on their campuses or in their local communities. NYSERDA received 40 proposals from 33 institutions. The three best solutions for an innovative clean energy project in energy efficiency, renewables, or GHG emission reduction won \$1 million each to help implement their plans. The winning institutions and projects:

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

This competition induced additional interest for REV Campus Challenge program. In its first year, 50 of the State's 250 institutions signed up to participate. To date, 100 schools participate in the program.

Success Story: Long Island Residential Solar Market Becomes Self-Sustaining

Under Governor Cuomo, New York established the NY-Sun program to support the development of a self-sustaining, incentive-free solar market in New York, with a goal to install 3 gigawatts of distributed solar by 2023. In 2014, the Governor announced that the state would commit a total of \$1 billion toward the program. The program is administered by NYSERDA and supported by NYSERDA's Clean Energy Fund and RGGI proceeds.

Long Island's electrical grid is geographically isolated from the rest of the state, making distributed generation assets an attractive option for meeting local demand. Further, Long Island residents demonstrated a strong appetite for NY-Sun in large part due to Long Island's first-hand experience with the devastation that can come from climate change. The program began with four blocks of incentives, with each successive block decreasing in incentive value, to support a total of 139 megawatts of solar development. In April of 2016, the state announced that Long Island's residential solar market reached the point of self-sufficiency and no longer required NY-Sun subsidies to support continued growth. It was the first region in the state to reach this historic milestone, with residential solar installations increasing by 320 percent since the program began in 2012. As of December 31, 2016, a total of 17,568 solar electric systems were installed on Long Island. This number had more than doubled to over 40,000 by June of 2018. In 2016, the NY-Sun program received a state leadership award in clean energy from the Clean Energy State Alliance. It was one of six programs nationwide to achieve this recognition.

Resources

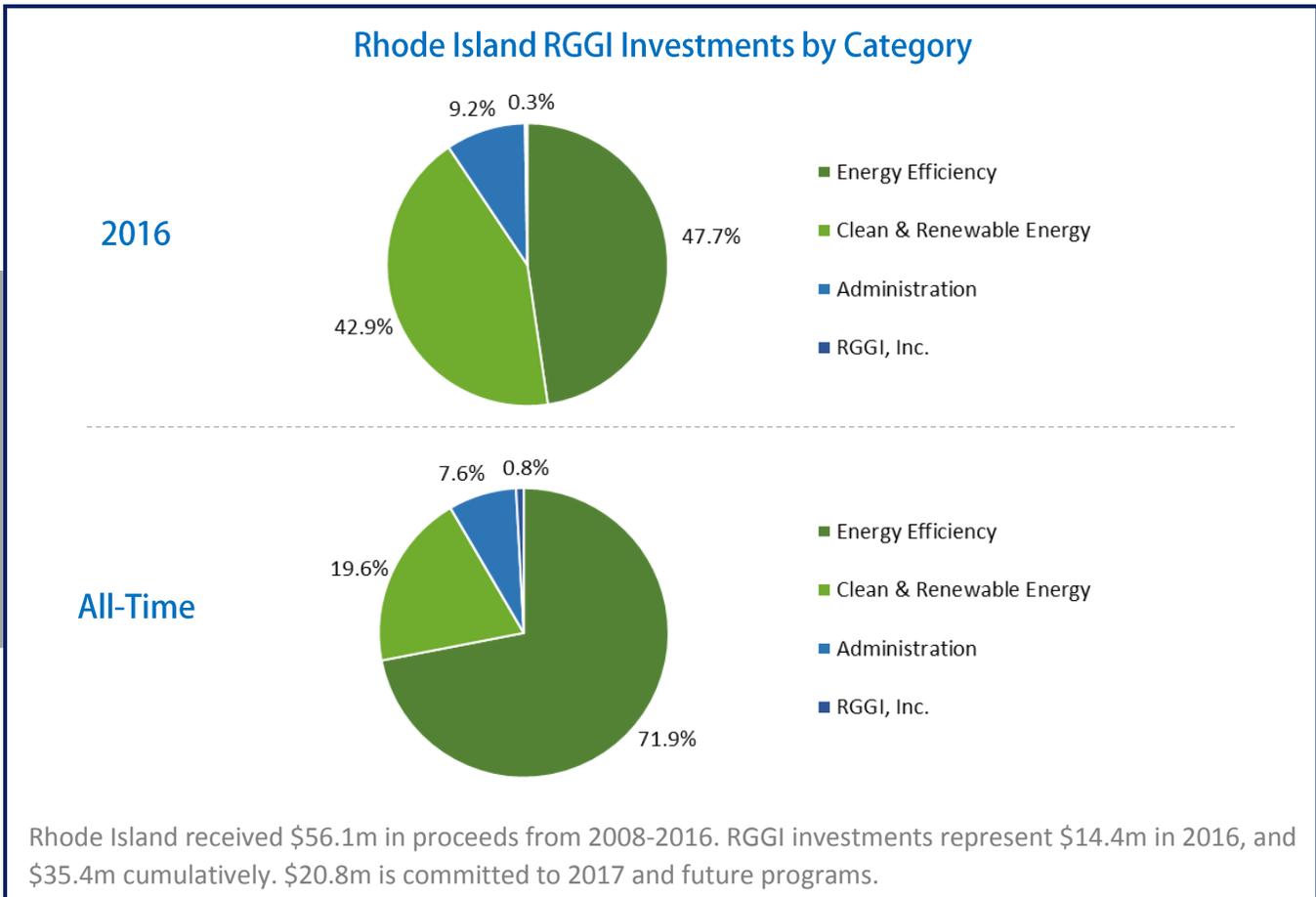
- [2016 and 2017 RGGI Operating Plan](#)
- [New York's Regional Greenhouse Gas Initiative-Funded Programs Status Report Quarter Ending December 31, 2016](#)

Rhode Island

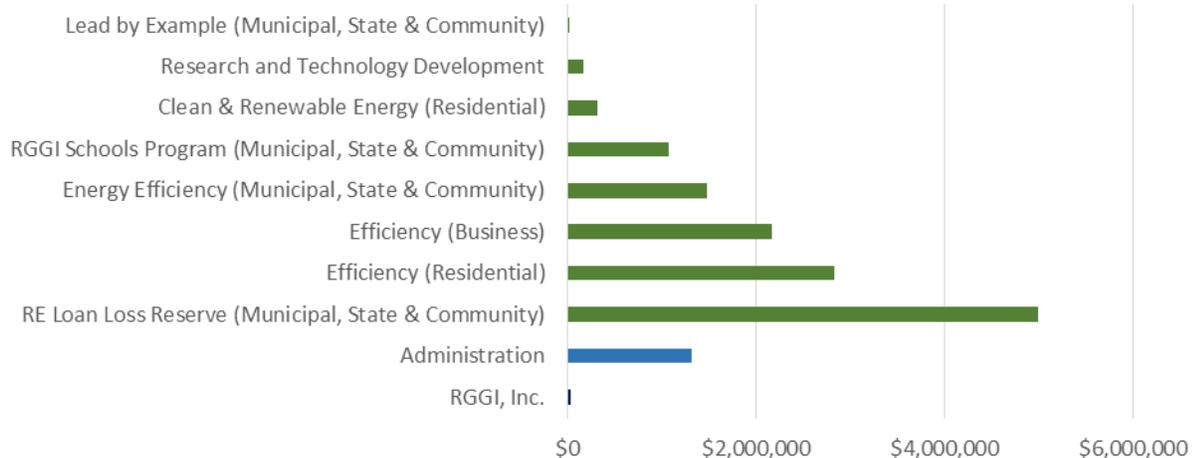
RGGI auction proceeds are allocated by the state’s Office of Energy Resources (OER) to drive investment in – and expansion of – clean energy resources, including cost-effective energy efficiency and renewables. In doing so, OER seeks to support investment and job growth in Rhode Island’s burgeoning clean energy sector; reduce barriers to consumer adoption of clean energy solutions; place downward pressure on long-term energy costs; and shrink carbon footprints.

RGGI auction proceeds are driving the adoption of cleaner, more sustainable energy solutions across public and private sector institutions, and in Ocean State communities. These investments are being made in a manner consistent with the Regional Greenhouse Gas Initiative Act, Rhode Island’s State Energy Plan, and broader state energy and environmental policy goals.

In 2016, Rhode Island RGGI proceeds were primarily allocated to energy efficiency and renewable energy programs. Proceeds were allocated to the state’s primary electric utility, National Grid, to support the broad implementation of Rhode Island’s nation-leading energy efficiency programs, while reducing the amount charged to utility customers to support these important cost-effective investments. RGGI dollars were also used to support the Rhode Island Infrastructure Bank’s (RIIB) Efficient Buildings Fund (EBF). RIIB’s EBF provides attractive, long-term financing to municipalities and quasi-public agencies for the completion of energy efficiency and renewable energy projects.



2016 Rhode Island RGGI Investments by Recipient



Rhode Island RGGI investments represent \$14.4 million in 2016.

EBF seeks to finance energy retrofits in public buildings that will result in electric and heating savings greater than 20% across all properties receiving improvements. To date, the Infrastructure Bank has made \$28 million in loans through the Efficient Buildings Fund. OER also invested funds in:

- Rhode Island Public Energy Partnership – a collaborative effort to achieve deep energy savings in state and municipal facilities;
- Rhode Island Schools (K-12) to support adoption of energy efficiency and renewable energy projects through a competitive grant process;
- Clean energy projects at State buildings;
- Local investments in energy efficiency and clean energy solutions in the Pascoag Utility District;
- The Rhode Island Solarize program, which seeks to increase the adoption of small-scale solar electricity in participating communities through a competitive tiered pricing structure that increases the savings for everyone as more home and business owners sign contract;
- Replacement of state-owned highway lights with cost-effective LED fixtures and lighting controls;
- Energy efficiency projects in the Town of New Shoreham (Block Island);
- System Reliability Procurement Distributed Generation Pilot (Evaluation Report): Between 2014 and 2018, OER conducted a pilot to explore the ability of solar arrays to reduce peak electricity needs on the local electric distribution system and thereby provide cost savings by postponing the need for utility upgrades. The pilot included incentives for orienting solar systems westward to align peak generation more closely with late afternoon periods of maximum summer electricity consumption; and
- Renewable Thermal Market Development Strategy (Report): The Renewable Thermal Market Development Strategy considered benefits, impacts, barriers, and opportunities to promote “renewable thermal” technologies in Rhode Island.



North Light Fibers mill where Philips brand LED lights were installed as part of Block Island Saves program. Photo courtesy of Sven Risom.

Program Highlight: Pilot Energy Efficiency Program for New Shoreham

Rhode Islanders spend over \$3 billion annually on energy to light their homes, keep the heat on, and fuel their vehicles. Energy efficiency programs represent the least-cost means to help local residents and businesses reduce energy consumption and lower energy bills. These cost-effective investments are also growing clean energy jobs; improving the health, safety, and comfort of our homes and workplaces; and reducing carbon footprints. Rhode Island is nationally recognized as a leader in energy efficiency by the American Council for an Energy Efficient Economy (ranked third in 2017).

Although mainland Rhode Islanders have long enjoyed access to innovative energy efficiency programs, rebates and incentives, these energy-saving measures have not, historically, been widely available to residents and businesses in the Town of New Shoreham (Block Island). In 2015, the Block Island Saves energy efficiency program was developed by the Rhode Island Office of Energy Resources to educate New Shoreham businesses and year-round residents about the benefits of energy efficiency and connect them to cost-effective energy-saving measures and incentives. Block Island Saves was developed in two stages – first as a targeted pre-pilot program in 2015 and then as a more robust full pilot in 2016-2017.

Success Story: Block Island Saves

Block Island Saves offered no-cost, no obligation energy assessments to year-round residents and businesses in the Town of New Shoreham. During the home energy assessment, a qualified Energy Specialist evaluated the home or business for opportunities to reduce energy use. Participants received a list of recommendations for energy efficiency improvements along with available rebates or incentives. The energy assessments looked at: lighting, appliances, heating and cooling systems, air sealing and insulation, thermostats and more.

Achievements of the 2015-2017 Block Island Saves program included:

- 79 year-round Block Island Residents and 31 businesses received free energy assessments, along with rebates and incentives for energy efficiency upgrades.
- Altogether, the 110 program participants are saving 313 MWh of electricity, 271 MMBtu of oil, and 136 MMBtu of propane annually.
- Energy savings also fostered a lifetime reduction of 2,420 tons of CO₂ equivalent.

Participants were able to decrease their energy bills too. In total, program participants are saving an aggregate \$597,968 (residential) and \$741,396 (business) over the lifetime of the efficiency upgrades.

Resources:

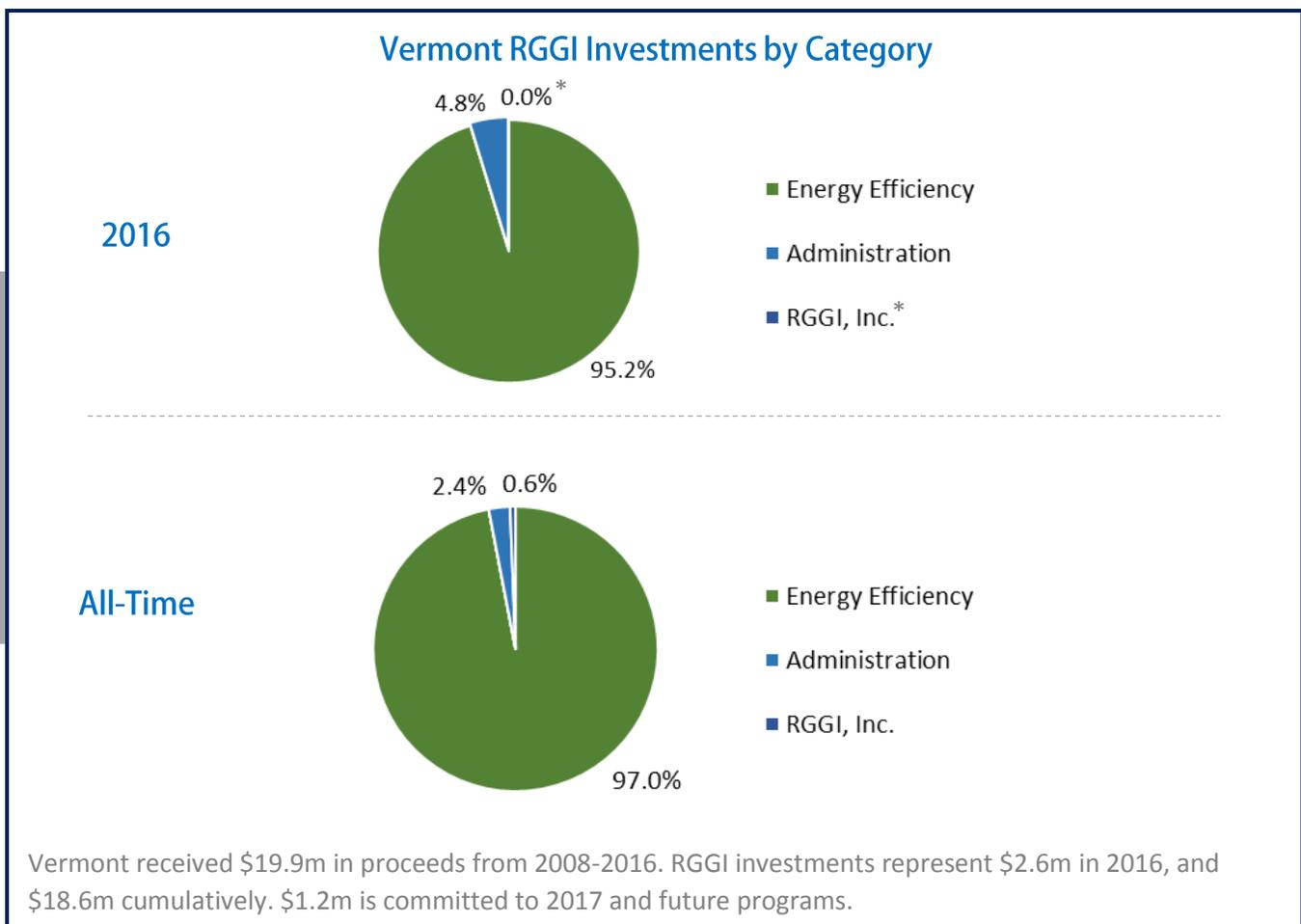
- [Rhode Island RGGI Auction Proceeds Allocation Plans](#)
- [Block Island Saves final report, April 2018](#)

Vermont

Vermont invests the majority of its CO₂ allowance proceeds in programs managed by Efficiency Vermont. RGGI funds allow these entities to expand their electrical energy efficiency programs to include thermal energy and process fuel efficiency programs. Efficiency Vermont’s participation in the regional grid’s forward capacity market also provides funds for this program expansion.

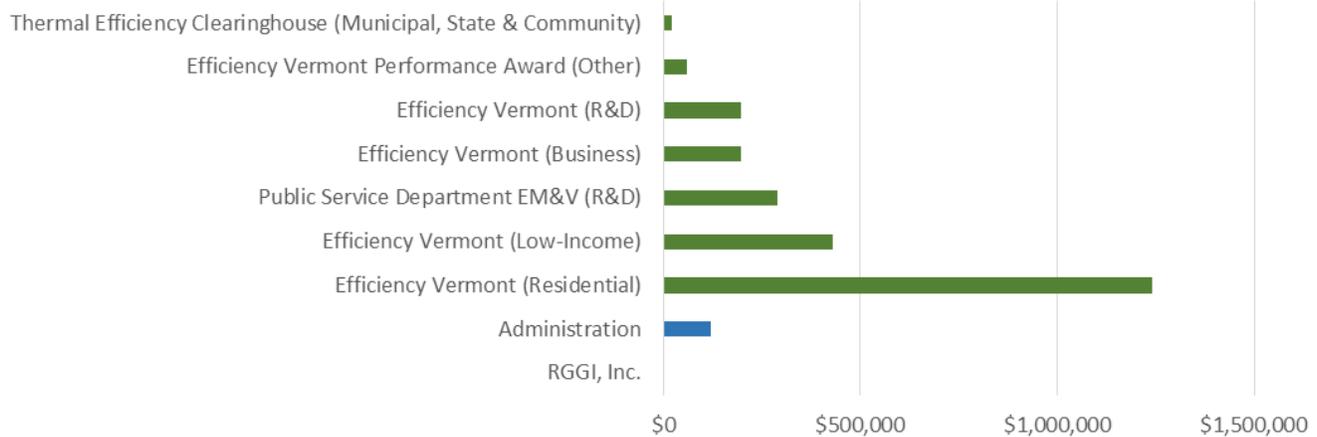
Vermont’s thermal energy and process fuel efficiency programs funded by RGGI through 2016 are estimated to result in lifetime energy savings of 3.9 million mMBTUs. These programs are estimated to avoid the emission of over 100,000 short tons of CO₂, and to save participants over \$155 million on their energy bills over the lifetime of those investments. Vermont’s RGGI-funded programs have served approximately 8,700 households and 500 businesses.

Programs currently supported by CO₂ allowance proceeds include the Home Performance with ENERGY STAR® service for residential customers, the Building Performance service providing incentives for efficiency services to small business customers, and low-income energy efficiency services through 3E Thermal project management.



* Vermont did contribute to the 2016 RGGI, Inc. operating budget, but this contribution was made at the end of the 2015 calendar year, and so was recorded in the 2015 report.

2016 Vermont RGGI Investments by Recipient



Vermont RGGI investments represent \$2.6 million in 2016.

Efficiency Vermont, the nation's first ratepayer-funded energy efficiency utility, is overseen by the Vermont Public Utility Commission, and implemented by Vermont Energy Investment Corporation. Efficiency Vermont's programs have a proven track record of saving energy and money for commercial, industrial and residential consumers. These and other energy efficiency programs helped to rank Vermont third in the nation in 2016, according to the American Council for an Energy Efficient Economy (ACEEE) State Energy Efficiency Scorecard.

Program Highlight: Home Performance with ENERGY STAR

The Efficiency Vermont Home Performance with ENERGY STAR service is an incentive-based program for single-family Vermont residences, including properties with fewer than five units, to lower utility bills and increase home comfort and safety by installing insulation, air sealing, ventilation, and heating systems improvements. Vermonters can access comprehensive thermal efficiency retrofits, incentives to offset project costs, and low-no interest rate financing through the Heat Saver loan. For eligibility, customers hire a participating Efficiency Excellence Network Home Performance with ENERGY STAR contractor. This allows customers to receive incentives of up to \$2000, ensures the contractor meets program eligibility requirements, and provides quality assurance for projects submitted to Efficiency Vermont.

The Efficiency Vermont Home Performance with ENERGY STAR service officially launched in 2005. In 2008, when the Vermont Legislature set a statewide goal to weatherize 80,000 homes by the year 2020, the Home Performance with ENERGY STAR service was galvanized. The legislation sought to harness energy efficiency as a driver of savings for consumers and economic development in Vermont. Home Performance with ENERGY STAR is one of the primary programs contributing to these goals.

Home Performance with ENERGY STAR is a national brand managed by the U.S. Department of Energy (U.S. DOE). Across the United States, there are some 50 organizations that have signed on to sponsor local programs under this overarching brand. Although there are differences among those local programs,

they all follow the same basic structure, designed to ensure a comprehensive, whole-house approach to energy efficiency and maximize long-term savings for homeowners. The key components of the Home Performance with ENERGY STAR program approach are outlined by U.S. DOE and implemented in Vermont by Efficiency Vermont.

Success Story: Morgan Family Home

The Morgan family purchased this 1905 colonial revival home in St. Johnsbury, Vermont in 2014. It wasn't long before the new owners were concerned about the high cost of heating this structure. They hired a local Home Performance with ENERGY STAR contractor to perform an energy audit, which revealed that there was no insulation in the wall cavities and only three inches of rock wool in the second-floor ceiling. The decision was made to conduct a whole-house weatherization project.

The work began with comprehensive air sealing and insulation. The homeowners agreed to forgo storage space for an air-sealed and well-insulated attic, and the crew framed over the attic stairwell and reduced it to an insulated access hatch after correcting existing structural damage to the roof system. The perimeter of the attic floor system was then dense-packed with cellulose using Insul-Cube dams. An air barrier was laid down over the floor with great attention to air sealing and taping. Next, 18 inches of loose-fill cellulose were blown over the air barrier. A catwalk was installed from the attic hatch to the two dormer windows, where louvered vents were installed for cross-ventilation. To maintain the original interior features, all exterior walls were insulated from the outside, using the "drill and fill" technique, while adhering to lead-safe practices. Cantilevered floor systems were filled with dense-pack cellulose, and new gaskets and sweeps were installed on all original wooden entry doors. Improvements were made to the bath fan ductwork to maximize airflow.

A subcontractor was brought in to spray three inches of closed-cell foam (covered with an intumescent coating) on the stone foundation walls and rim joists. Also, heat recovery ventilation was installed following the recommendations from the original energy audit. All these improvements added up to a 60% reduction in airflow (blower door test results went from 3,320 CFM50 to 1,303 CFM50). Energy modeling software estimated annual savings of \$2,035.

Resources:

- [Efficiency Vermont Rebates](#)
- [Efficiency Vermont Services](#)
- [Efficiency Vermont News](#)



The Morgan family home in St. Johnsbury, VT.
Photo courtesy of Efficiency Vermont.

Glossary and Methodology

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 include incentives for residential solar panels, financing of commercial renewable energy projects through green banking, research and development of new energy technologies.

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 CO₂ Budget Trading programs.

General Terms

RGGI Investments

RGGI Investments are the proceeds generated by RGGI CO₂ allowance auctions that have been invested by the RGGI states in the energy efficiency, clean and renewable energy, GHG abatement, and direct bill assistance 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 funds are the proceeds generated by RGGI CO₂ 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 2017 and beyond.

Current Period

The twelve-month period covered by this report, which may be either the fiscal year or calendar year 2016, as defined by each state.

Benefits and Statistics

Annual (2016)

A measure of one year's worth of benefits from all measures installed in 2016. Note that actual realized benefits in the year 2016 may differ slightly from the 2016 annual benefits, since measures may be installed at different times during the year.

Lifetime (2016)

The full benefits of measures installed in 2016, including benefits to be realized in the future. The lifespan of installed measures varies by type of measure and by program, and is calculated and provided by program administrators. For example, an industrial boiler would likely be estimated to provide benefits over a longer lifespan than an LED lightbulb. Measure lifespans used in this report typically range between 5-25 years.

Lifetime (All-Time)

The total estimated lifetime benefits of all measures installed since the inception of the RGGI program. This includes the full lifetime benefits of measures installed in previous years, in addition to the lifetime benefits of 2016 measures.

Funds Invested

Total dollar amount of RGGI proceeds invested in a program or category over a given 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: Programs

Number of households that have directly received assistance as a result of each program (e.g. number of homes weatherized, number of households receiving home energy audits, etc...). 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 may be considered to be a household. For retail programs such as lightbulb distribution, households may be extrapolated from the number of items distributed.

Participating Households: Direct Bill Assistance

Number of households receiving direct bill assistance or energy bill rebates funded through RGGI proceeds. Bill assistance programs vary by state; in some cases rebates may be returned to all customers, while in other cases they may be targeted to low-income customers or to specific customer types.

Participating Businesses: Programs

Number of "end-user" businesses 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). 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: Direct Bill Assistance

Number of businesses receiving direct bill assistance or energy bill rebates funded through RGGI proceeds.

Workers Trained

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

Estimated total MWh projected to be avoided as a result of RGGI funds invested, calculated using program-specific savings as defined by each state.

MMBtu Avoided

Estimated total MMBtu projected to be avoided as a result of RGGI funds invested, calculated using program-specific savings as defined by each state.

Energy Bill Savings

Estimated gross amount saved as a result of RGGI funds invested (initial investment in installed measures is not deducted). Calculated using program-specific savings, as defined by each state. Estimates of lifetime energy bill savings are given in current year dollars as of the start of the savings, and in most cases are not discounted into the future. Where discounts are applied, they are noted on state-specific pages.

CO₂ Emissions Avoided

Estimated total number of short tons of CO₂ avoided as a result of funds invested, calculated using a program-specific formula as defined by each state.

Cars Taken Off the Road

Estimated number of cars that would need to be taken “off the road” for one year to reduce CO₂ emissions by the same amount as the RGGI-funded measures. Calculated using average annual CO₂ emissions for passenger cars (10,582 pounds or 5.29 short tons of CO₂), as published by the U.S. Environmental Protection Agency. View conversion rates at: <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>.

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