

# The Regional Greenhouse Gas Initiative

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

## The Investment of RGGI Proceeds in 2017

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## Executive Summary

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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 2017 by \$315.6 million in RGGI investments, which have reduced harmful carbon dioxide (CO<sub>2</sub>) pollution while spurring local economic growth. The lifetime effects of these RGGI investments are projected to save 22.6 million MMBtu of fossil fuel energy and 13.9 million MWh of electricity, avoiding the release of 8.3 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 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 CO<sub>2</sub> 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 support businesses. RGGI investments in 2017 are estimated to return \$1.4 billion in lifetime energy bill savings to nearly 300,000 households and 3,000 businesses that participated in programs funded by RGGI proceeds, and to more than 100,000 households that received direct bill assistance.

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

**Energy efficiency** makes up 51% percent of 2017 RGGI investments and 58% of cumulative investments. Programs funded by these investments in 2017 are expected to return \$879.3 million in lifetime energy bill savings to over 291,000 participating households and 3,000 businesses in the region.

**Clean and renewable energy** makes up 14% of 2017 RGGI investments and 14% of cumulative investments. RGGI investments in these technologies in 2017 are expected to return \$329 million in lifetime energy bill savings and avoid the release of 1.3 million short tons of CO<sub>2</sub> pollution.

**Greenhouse gas abatement** makes up 14% of 2017 RGGI investments and 8% of cumulative investments. RGGI investments in greenhouse gas (GHG) abatement in 2017 are expected to avoid the release of 431,000 short tons of CO<sub>2</sub> pollution.

**Direct bill assistance** makes up 16% of 2017 RGGI investments and 14% of cumulative investments. Direct bill assistance programs funded through RGGI in 2017 have returned \$49 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 GHG pollution and improving energy efficiency.

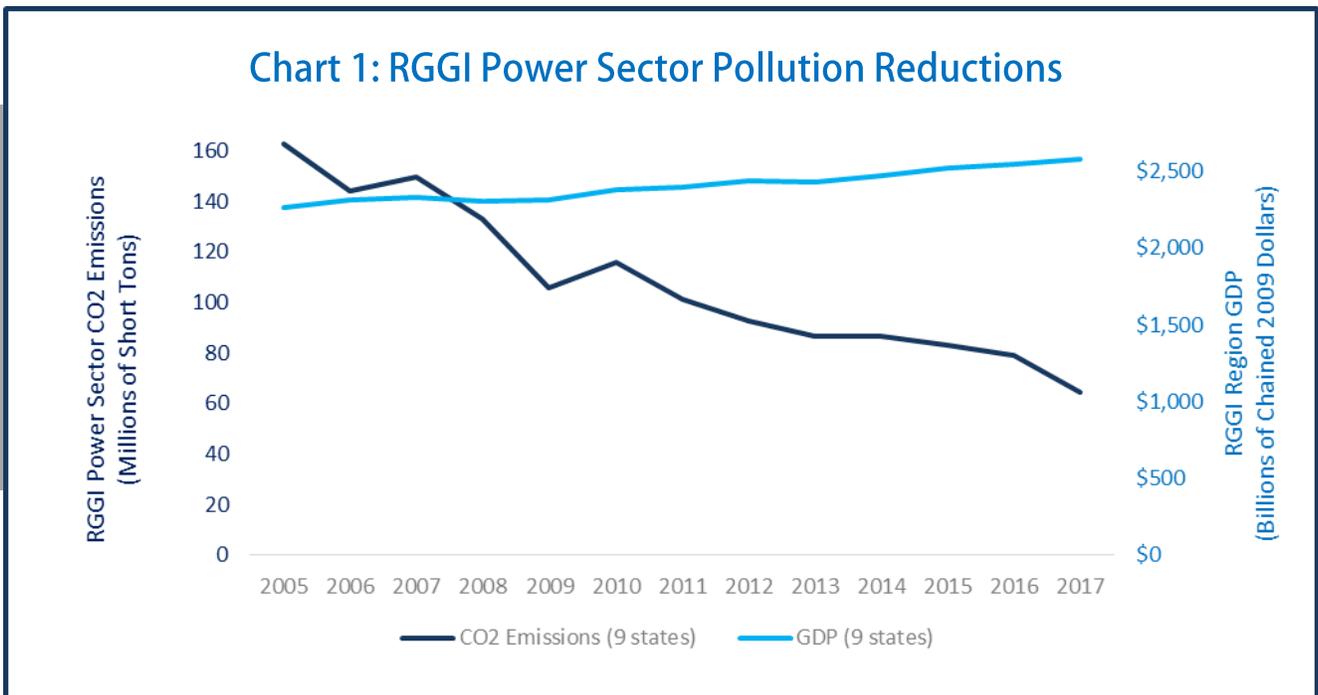
# Introduction

## The Regional Greenhouse Gas Initiative

RGGI is the nation's first multi-state program to reduce power sector CO<sub>2</sub> 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 CO<sub>2</sub> pollution that power plants can emit, by issuing a limited number of tradable CO<sub>2</sub> allowances. Each allowance represents an authorization for a regulated power plant to emit one short ton of CO<sub>2</sub>. Individual CO<sub>2</sub> budget trading programs in each RGGI state together create a regional market for CO<sub>2</sub> allowances. This allows market forces to determine the most cost-effective means of reducing emissions, and creates market certainty to drive long-term investments in clean energy. Each state's independent regulations are based on the RGGI Model Rule.

The RGGI states have distributed 90% of CO<sub>2</sub> 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 100 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.



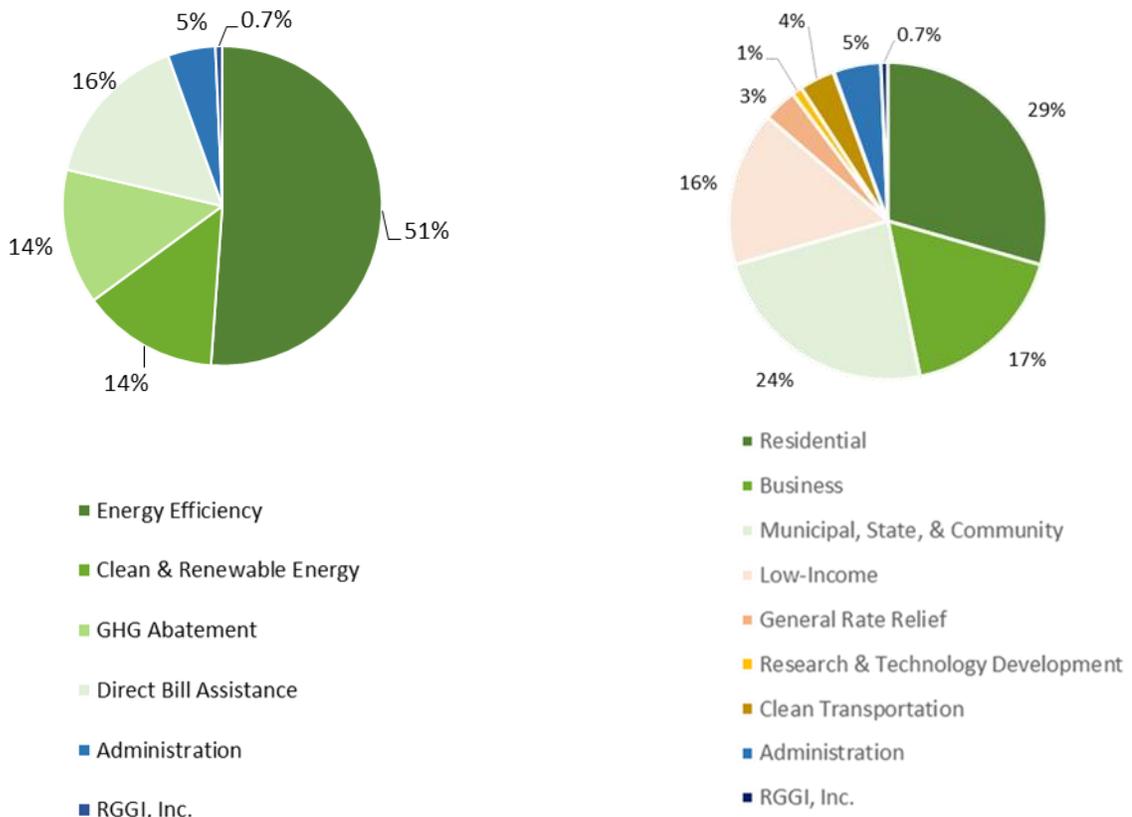
## 2017 RGGI Investments

This report estimates the benefits (such as energy bill savings and short tons of CO<sub>2</sub> emissions avoided) that arise from \$315.6 million in 2017 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 2017 annual investments. RGGI investments throughout the region cover a wide variety of programs. **Chart 2** shows 2017 RGGI investments divided between major program categories.

**Chart 3** illustrates the same 2017 funds divided in a different way, according to the type of end-user who benefits from the program or receives 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: 2017 RGGI Investments by Category and Recipient



The RGGI states invested \$315.6MM in 2017.

**Table 1: Benefits of 2017 RGGI Investments**

Category	Annual Benefits of 2017 Investments	Lifetime Benefits of 2017 Investments
 Participating Households	Program*: 294,787 Direct Bill Assistance: 100,057	N/A
 Participating Businesses	3,331	N/A
 Workers Trained	83	N/A
 Short Tons CO <sub>2</sub> Avoided	438,099	8,258,236
 Equiv. Cars Off Road	84,381	1,590,604
 Megawatt-Hours Saved	699,019	13,913,252
 MMBtu Saved	1,424,199	22,637,135
 Energy Bill Savings	\$128,704,015	\$1,400,088,616

\*Participants in all programs other than direct bill assistance.

In 2017, over 294,000 households and businesses participated in programs funded by RGGI investments, while over 100,000 households 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 \$1.4 billion on their energy bills, and avoid the use of over 13.9 million MWh of electricity and 22.6 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 across states and across programs. 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 that comes from RGGI.

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

## Energy Efficiency

Energy efficiency represents the largest portion of 2017 RGGI investments, at 51%. Over the lifetime of the installed measures, 2017 investments in energy efficiency funded through RGGI proceeds are projected to save participants over \$879 million on energy bills, providing benefits to more than 291,000 participating households and 2,600 participating businesses. They are also projected to avoid the release of 6.6 million short tons of CO<sub>2</sub> pollution (see **Table 2**).

**Table 2: Benefits of 2017 RGGI Investments in Energy Efficiency**

Category	Annual Benefits of 2017 Investments	Lifetime Benefits of 2017 Investments
 Participating Households	291,761	N/A
 Participating Businesses	2,605	N/A
 Workers Trained	83	N/A
 Short Tons CO <sub>2</sub> Avoided	333,115	6,552,098
 Equiv. Cars Off Road	64,161	1,261,988
 Megawatt-Hours Saved	574,956	11,582,768
 MMBtu Saved	1,011,924	18,156,893
 Energy Bill Savings	\$55,671,919	\$879,295,958

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 saving on their energy bills.

Energy efficiency also creates jobs. Programs such as home retrofits directly spur employment gains in housing and construction. Lower energy costs create numerous benefits across the economy, allowing families to invest in other priorities and businesses to expand.

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, the Regulatory Assistance Project, and others.

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 2017'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 14% of 2017 RGGI investments in the region. Over the lifetime of the projects installed in 2017, these investments are projected to offset \$329.6 million in energy expenses for nearly 500 households and businesses. They are also projected to avoid the release of 1.2 million short tons of CO<sub>2</sub> pollution (see **Table 3**).

Category	Annual Benefits of 2017 Investments	Lifetime Benefits of 2017 Investments
 Participating Households	18	N/A
 Participating Businesses	478	N/A
 Short Tons CO <sub>2</sub> Avoided	66,929	1,274,188
 Equiv. Cars Off Road	12,891	245,419
 Megawatt-Hours Saved	124,022	2,329,659
 MMBtu Saved	35,645	699,833
 Energy Bill Savings	\$14,877,626	\$329,572,629

Clean energy systems require labor to install, which creates jobs and boosts local economic activity. Energy expenditures that might otherwise flow to out-of-state fossil fuel resources stay within the region. As with energy efficiency, “behind-the-meter” programs also contribute to lowering wholesale electricity prices by 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 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 93%. In 2017 the RGGI states derived 53% 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 14% of 2017 RGGI investments supported GHG abatement programs. Over their lifetime, the investments made in 2017 are expected to avoid the release of over 431,000 short tons of harmful CO<sub>2</sub> pollution into the atmosphere (see **Table 4**).

Programs in the GHG abatement category may vary significantly, and may drive GHG emission reductions 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 2017 RGGI Investments in GHG Abatement**

Category	Annual Benefits of 2017 Investments	Lifetime Benefits of 2017 Investments
 Participating Households	3,007	N/A
 Participating Businesses	43	N/A
 Short Tons CO <sub>2</sub> Avoided	38,055	431,951
 Equiv. Cars Off Road	7,330	83,197
 MMBtu Saved	376,629	3,780,439
 Energy Bill Savings	\$8,773,990	\$141,839,911

## Direct Bill Assistance

Direct bill assistance returns money to consumers as a rebate on their energy bills. Approximately 16% of 2017 RGGI investments have funded direct bill assistance. RGGI investments in direct bill assistance in 2017 returned \$49 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.

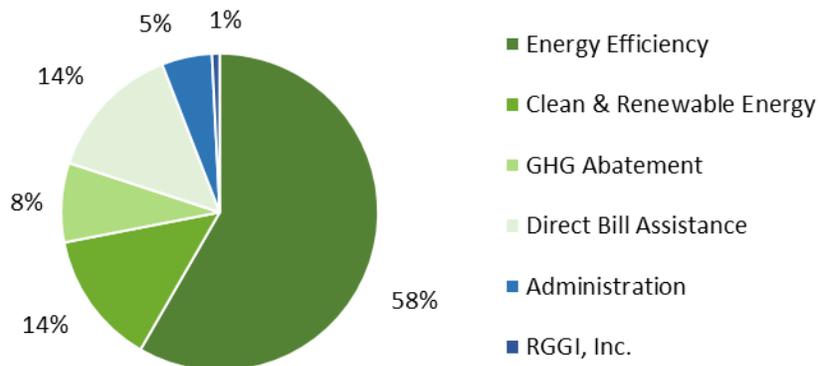
**Table 5: 2017 RGGI Investments in Direct Bill Assistance**

Category	Annual Benefits of 2017 Investments	Lifetime Benefits of 2017 Investments
 Participating Households	100,057	N/A
 Participating Businesses	205	N/A
 Energy Bill Savings	\$49,380,480	N/A

## Cumulative Uses of Auction Proceeds

While this report focuses primarily on 2017 data, information on cumulative RGGI investments is provided in this section as an overview of RGGI's track record. **Chart 4**, below, shows the percentage of all-time RGGI investments directed to each of the major program categories.

**Chart 4: Cumulative RGGI Investments by Category**



The nine participating RGGI states invested \$2.4 billion from the start of the program through 2017. \$161.4MM remained to be invested in 2018 and future programs. \$106MM was transferred to state general funds.

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 2017 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 CO<sub>2</sub> emissions avoided, that 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 2017 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.

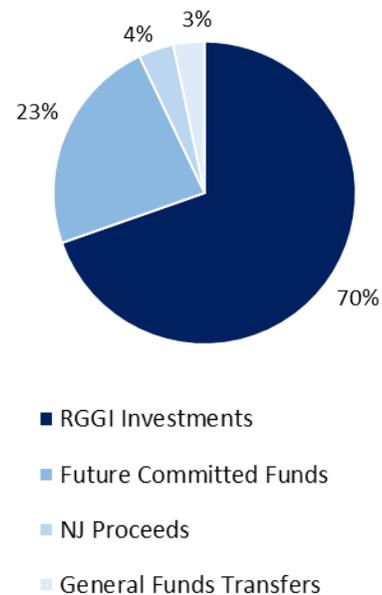
**General fund transfers:** In some cases proceeds have been transferred to state general funds by acts of state legislatures. Any benefits generated from these proceeds are not within the scope of this report.

**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, 2017	\$2,742,929,834
Adjustment for Fiscal Year Reporting	-\$29,662,921
New Jersey Proceeds	\$113,344,551
General Funds Transfers	\$106,200,076
Future Committed Funds	\$161,429,441
<b>RGGI Investments</b>	<b>\$2,445,637,395</b>



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 \$2.4 billion in the period covered by this report. NJ received \$113.3 million in proceeds from 2009-2011. This leaves \$161.4MM funds that 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 CO<sub>2</sub> 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	7,279,406
 Participating Businesses	176,156
 Workers Trained	8,233
 Short Tons CO <sub>2</sub> Avoided	34,217,262
 Equiv. Cars off Road	6,590,526
 Megawatt-Hours Saved	47,364,488
 MMBtu Saved	141,798,265
 Energy Bill Savings	\$9,271,415,070

Previously reported cumulative benefits plus 2017 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

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Connecticut predominantly allocates its RGGI auction proceeds towards supporting the energy efficiency programs of the Connecticut Energy Efficiency Fund (CEEF)<sup>1</sup>, the Connecticut Municipal Electric Energy Collective (CMEEC)<sup>2</sup>, and the Town of Wallingford—Electric Division (WED), and advancing the development of Class I renewable energy sources via the Connecticut Green Bank. However, during 2017, 52% (~\$7 million) of Connecticut's RGGI auction proceeds (~\$13.5 million) was transferred to the general fund by acts of the state legislature to resolve fiscal budget shortfalls.<sup>3</sup> Of the remaining \$6.5 million in 2017 auction proceeds, Connecticut allocated 69.5% toward energy efficiency programs, and 23% toward renewable energy deployment.

During 2017, Eversource Energy and The United Illuminating Company focused RGGI funding on weatherization measures under the CEEF's Home Energy Solutions<sup>SM</sup> program for families who heat their homes with fuel oil or propane. CMEEC invested a large share of its RGGI funding to achieve a LED streetlight retrofit project in Groton and Bozrah. CMEEC also invested RGGI funding on deploying energy efficient light bulb replacements, measures under its Home Energy Savings program, and incentives for energy efficient products (e.g., air conditioners, heat pumps, and water heaters). WED utilized RGGI funding to perform home energy audits and provide energy efficiency and weatherization measures.

The CT Green Bank invests its share of RGGI proceeds into its Commercial Property Assessed Clean Energy (C-PACE) program, which offers low interest, no-money-down financing for clean and renewable energy projects. To date, C-PACE has used RGGI funds to help to finance a total of 91 completed projects, including 11 projects completed during 2017.

In the 2018 State Energy Efficiency Scorecard, which evaluated 2017 state efficiency efforts, the American Council for an Energy-Efficient Economy (ACEEE) ranked Connecticut fifth in the nation. In particular, ACEEE noted that Connecticut advanced efficiency in the buildings sector by adopting the 2015 International Energy Conservation Code<sup>®</sup> (IECC), the second code update in two years.

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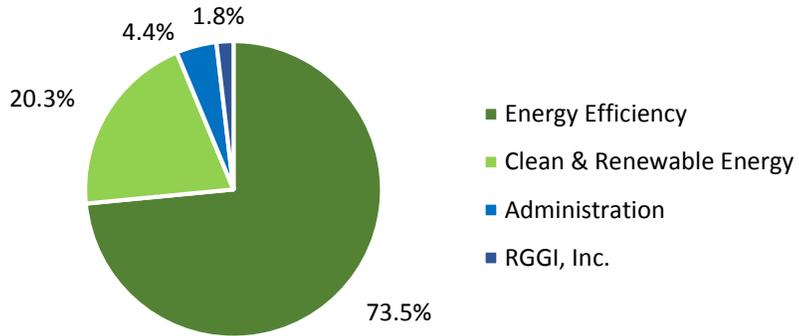
<sup>1</sup> CEEF's efficiency programs are administered by electric (Eversource and The United Illuminating Company) and gas (Connecticut Natural Gas Corporation, Southern Connecticut Gas Company, and Yankee Gas Services Company) distribution companies, and marketed under the brand Energize Connecticut<sup>SM</sup>.

<sup>2</sup> CMEEC is a joint action supply and transmission agency established by six of the state's municipal electric utilities (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).

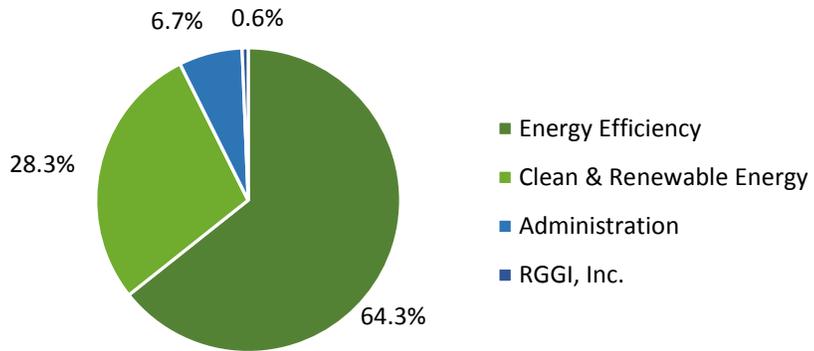
<sup>3</sup> Pursuant to Public Act 16-3, \$3.3MM of Connecticut's proceeds from RGGI Auctions 35 and 36 were diverted to the State of Connecticut's general fund. Pursuant to June Special Session, Public Act 17-2, a total of \$10MM of Connecticut's proceeds was diverted to the general fund during fiscal year 2018, starting with Auction 38, which yielded \$3,667,193.80. Altogether, the total diversion during 2017 amounted to \$6,967,193.80.

### Connecticut RGGI Investments by Category

2017

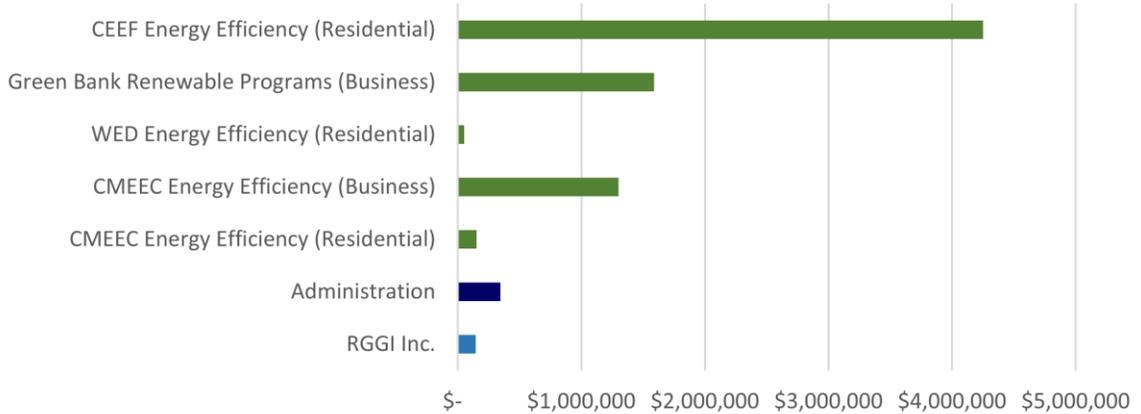


All-Time



Connecticut received \$187MM in proceeds from 2008-2017. RGGI investments represent \$7.8MM in 2017, and \$180MM cumulatively. In addition, in 2017 \$6.9MM was transferred to the state general fund.

### 2017 Connecticut RGGI Investments by Recipient



Connecticut RGGI investments represent \$7.8MM in 2017.

## Program Highlight: Home Energy Solutions<sup>SM</sup>

Connecticut's nationally recognized Home Energy Solutions<sup>SM</sup>, an Energize Connecticut<sup>SM</sup> program, is funded by mandated conservation charges collected from electric and natural gas ratepayers, who in turn can receive its services. RGGI proceeds provide funding that allows families who heat their homes with fuel oil or propane to receive services under this program.

The Home Energy Solutions<sup>SM</sup> program enables evaluation of a home's energy performance and installation of core weatherization and energy-saving measures such as sealing air leaks, and installing energy-efficient lighting, faucet aerators and low-flow showerheads.<sup>4</sup> The average home in Connecticut receives about \$1,000 in services and realizes \$200-\$250 in savings on their annual energy bills. Additionally, families receive recommendations for deeper energy-saving measures (e.g., Wi-Fi thermostats, insulation, high-efficiency heating and cooling, water heating, windows, and appliances), and information on rebates and financing options.

## Success Story: Cape Cod-style Home in Burlington, CT

Cape Cod style homes circa 1979 are a picturesque yet energy-inefficient staple of the New England landscape. For one Burlington, Connecticut family, it was time to do something about that. Mia S. signed up her 1,965-square foot home to participate in Home Energy Solutions<sup>SM</sup> through Eversource. This presented an opportunity to achieve above-average air and duct sealing to reduce drafts and improve comfort. Mia's home received \$3,000+ worth of oil and electric-saving measures for a cost of \$174. Over the lifetime of the installed improvements, Mia and her family will save \$650 annually. The expected savings of the improvements installed are:



### *Air & duct sealing:*

- 262 gallons of oil annually
- 5,246 gallons of oil during the expected lifetime benefit of the sealing

### *Faucet aerators, pipe insulation, and LED bulb replacements:*

- 881 kWh annually
- 7,651 kWh during the expected lifetime use of the installed measures

*Photo courtesy of Eversource*

Leaks were sealed and insulation was replaced. The improvements are estimated to avoid 62 tons of CO<sub>2</sub> emissions over their lifetime, equivalent to taking 14 cars off the road for a year.

## Resources:

- [Energy Efficiency Board 2017 Programs and Operations Report](#)
- [Energize Connecticut<sup>SM</sup>](#)
- [Home Energy Solutions<sup>SM</sup> - Core Services](#)
- [C-PACE](#)

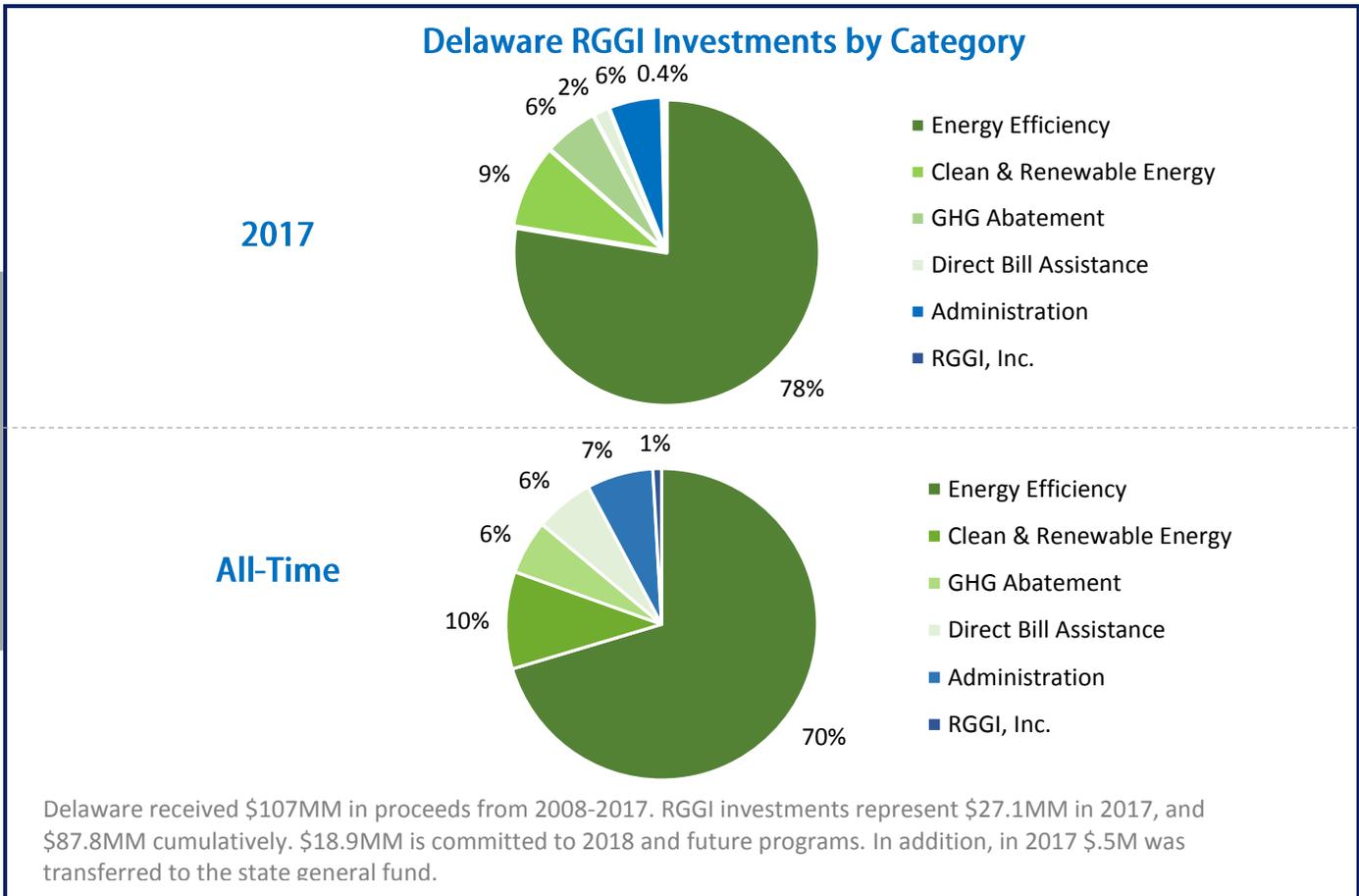
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<sup>4</sup> The cost to the customer is \$149 if the home is heated with natural gas or electricity, or \$174 if the home is heated with oil, propane or any other fuel.

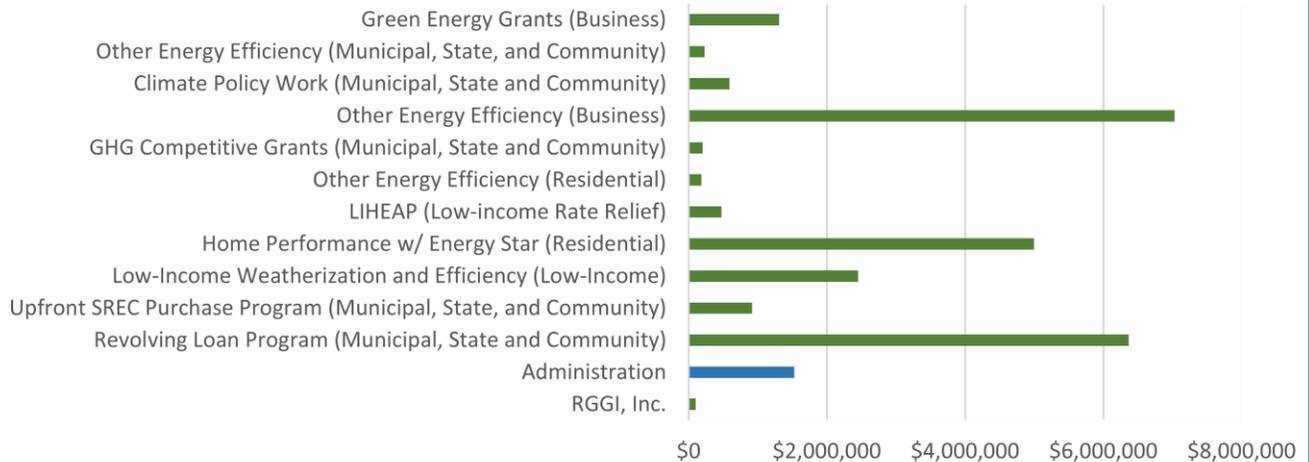
# Delaware

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% 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 addition, Delaware directs 10% 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. 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 a program to reduce energy bills for low-income customers.



## 2017 Delaware RGGI Investments by Recipient



Delaware's RGGI investments represent \$27.1MM in 2017.

## Program Highlight: Energy Efficiency Investment Fund

The Delaware Energy Efficiency Investment Fund (EEIF) provides financial incentives to Delaware businesses, local governments, and non-profits to implement energy efficiency upgrades that reduce energy use, resulting in operational cost savings. The program has four pathways: Energy Assessments, Prescriptive, Custom, and Combined Heat and Power (CHP). The two most popular pathways are Prescriptive and Custom. The Prescriptive Pathway provides incentives for common efficiency measures and is designed to reduce paperwork and administrative costs. The Custom Pathway supports more complex and comprehensive energy savings projects. While the majority of projects completed through EEIF are for prescriptive lighting, it also has funded heating, ventilation and air conditioning measures, combined heat and power projects, and refrigeration upgrades.

The program was established in 2011 and was initially funded through a portion of the state's Public Utility Tax. In 2017, RGGI funds were added to the program to augment the number of projects that could be completed and to increase the energy and economic benefits this program brings to the state.

## Success Story: Delaware State Fair

Delawareans across the state plan their summer around the Delaware State Fair, located on the Delaware State Fairgrounds in Harrington, Delaware. The Fairgrounds are used year-round and boast a casino, race track, ice-rink, and show arenas. The Delaware State Fair Board received several prescriptive lighting grants for a site-wide LED retrofit. One particular project worth highlighting was an LED retrofit of their workshop and the Quillen Arena—a 20,000 square-foot, 20-year-old facility. The grant paid for 26% of the project's \$15,247 total cost. As a result of the work on this project alone, the Delaware State Fair is saving approximately \$1,907 annually on its utility bill and has reduced annual electricity usage by 17,340 kWh. The reduced energy consumption from this project equates to a greenhouse gas reduction of 12.20 MtCO<sub>2</sub>e annually.

George Scuse, facilities manager for the Delaware State Fair. “By going with the LED lights, it has helped us on our demand usage, as well as helped our customers that rent our facility by reducing their electric cost, so it is a win-win for all of us. The thing to look at is your return on investment numbers to see just how long before they have paid for themselves. We had a three-year payback on one project and one was one and a half years. Then you are putting that money in your bank account.”



*Photo courtesy of DE Dept. of Natural Resources and Environmental Control*

## Resources:

- Delaware Division of Climate, Coastal, and Energy: [de.gov/dcce](http://de.gov/dcce)
- Delaware SEU: [www.energizedelaware.org](http://www.energizedelaware.org)
- Weatherization: [www.de.gov/wap](http://www.de.gov/wap)
- Delaware Clean Transportation Incentive Program: [de.gov/cleantransportation](http://de.gov/cleantransportation)

## Maine

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The Efficiency Maine Trust (Efficiency Maine) is the independent, third-party administrator for programs to improve the efficiency of energy use and reduce greenhouse gases in Maine. The Trust does this primarily by delivering incentives for high-efficiency equipment or operational changes to help Maine customers save electricity, natural gas and other fuels. 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*
- *Promote investment in cost-effective energy and energy efficiency measures and systems that use alternative energy resources that reduce overall energy costs for Maine consumers.*

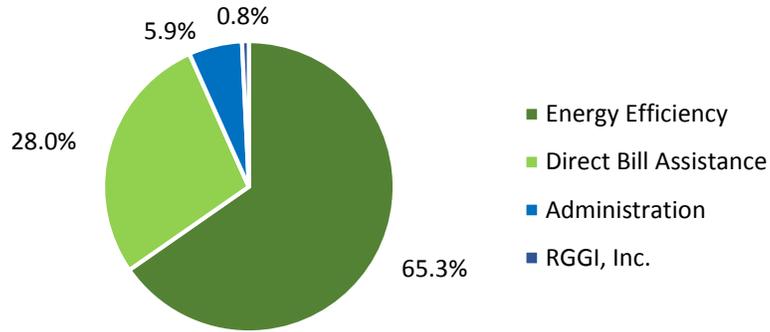
Efficiency Maine's programs are funded primarily by a combination of electric and natural gas system benefit charges, Forward Capacity Market proceeds, and RGGI proceeds. During its 2017 fiscal year (FY17), Efficiency Maine invested over \$10.7 million in RGGI proceeds, directing approximately 93% towards a combination of energy efficiency programs and direct bill assistance to large manufacturers; the remaining 7% went toward general administration. Though nearly all of Efficiency Maine's programs leveraged RGGI funding to some degree in FY17, the bulk of funds were invested through the following four programs:

- *Home Energy Savings Program:* Drove market-based home weatherization and heating demand reduction by offering rebates and loans, providing customer education, and developing a vendor network.
- *Low Income Home Energy Savings Program:* Targeted low-income customers by providing enhanced incentives for residential energy audits, home weatherization, and heating systems within the market-based channel.
- *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.

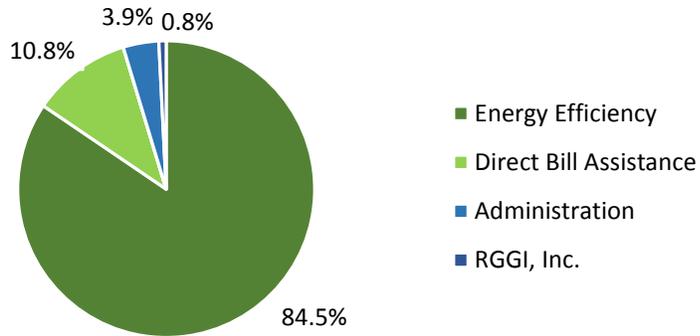
Over the lifetime of the investments made in FY17, Maine's RGGI-funded efficiency measures are estimated to generate savings of over 10,350 MWh in avoided electricity use and another 5.4 million MMBtu in avoided consumption of natural gas and other heating or process fuels. These investments will lower participants' energy bills by more than \$39 million.

### Maine RGGI Investments by Category

2017

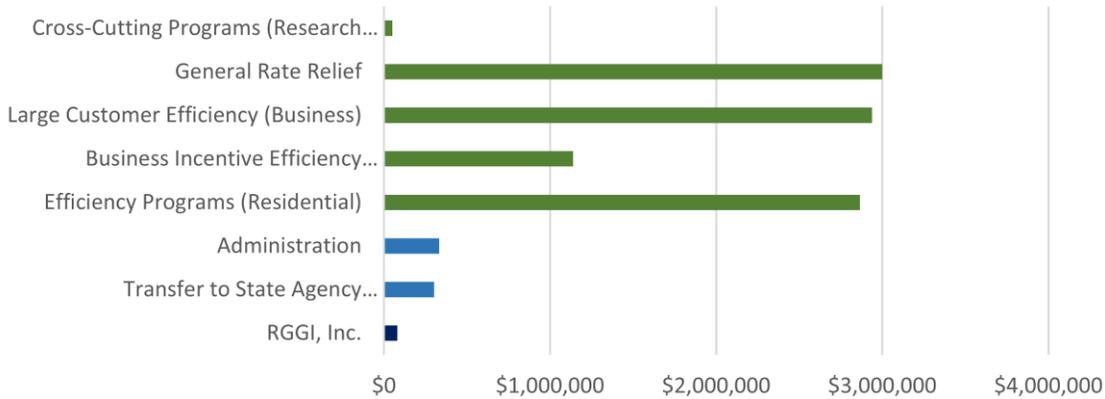


All-Time



Maine received \$86.5MM in proceeds from 2008-2017. RGGI investments represent \$10.7MM in FY17, and \$76.3MM cumulatively. \$10.2MM is committed to FY18 and future programs.

### 2017 Maine RGGI Investments by Recipient



Maine RGGI investments represent \$10.7MM in FY17.

## 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 rebates, financing, and customer education. HESP raises awareness about the benefits of home weatherization and encourages Maine homeowners to make energy efficiency upgrades. Following statutory requirements set forth in the 2013 Omnibus Energy Bill, Efficiency Maine invested a portion of RGGI revenues on reducing home heating demand. This expanded funding to projects that save heating oil, Maine's most common home heating fuel, and lower greenhouse gases without relying on federal funds.

In FY17, \$3.2 million of RGGI funds were invested through HESP, constituting approximately 42% of the total HESP budget. Over the year, HESP provided more than 8,000 participants with rebates for energy-saving measures, including nearly 4,800 high performance heat pumps. There was also significant interest in pellet technologies, with 86 pellet boilers and 110 pellet stoves installed in Maine homes over the course of the program year. Through these incentives, Efficiency Maine was able to facilitate over \$10 million in private energy efficiency investments.

In FY17, HESP continued to offer loans for 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 other loan products. In FY17, Efficiency Maine provided 417 loans supporting \$3.2 million worth of home energy upgrade projects; unsecured loans accounted for 92% of dollar volume and 95% of the total number of loans that the Trust issued. The average amount financed per loan was \$7,600.

## Success Story: Ducktrap River Efficiency Project

Ducktrap River of Maine produces smoked seafood in Belfast, Maine for retail sale across the country. Due to high product demand, the company renovated a building to house 20,000 square feet of new process space. The majority of this space is conditioned to 50°F, with some areas kept as cold as -30°F. The company was originally considering a decentralized refrigeration system with individual units serving dedicated areas of the building. However, with the help of Efficiency Maine, they were able to move to a considerably more efficient cooling system—a centralized rack-based refrigeration system in which waste heat is used to warm water for the production process.

Given the relatively complex, site-specific nature of the project, Ducktrap worked with Efficiency Maine's Commercial and Industrial (C&I) Custom Program. The program was able to offer a \$59,154 incentive on the \$194,920 project. This award defrayed the higher upfront capital cost of the more efficient option, bringing the simple payback period down from 2.5 years to 1.6 years. This investment will save Ducktrap approximately 1,971 MMBtu of propane and 242,000 kWh of electricity annually, reducing 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 Ducktrap project resulted in both propane and electricity savings, the program split funding proportionally between RGGI and electric system benefit charge dollars.

## Resources:

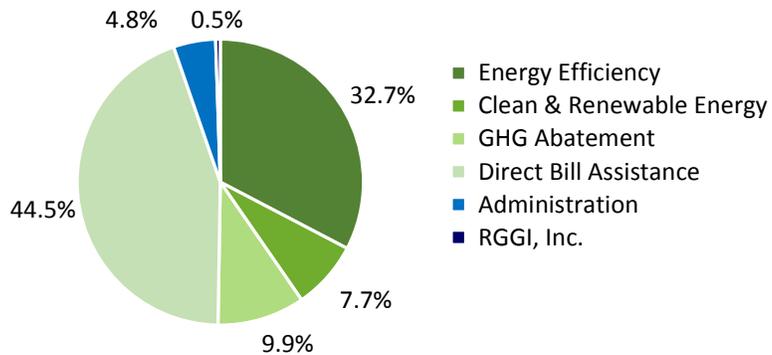
- <https://www.energymaine.com/docs/FY2017-Annual-Report.pdf>

# Maryland

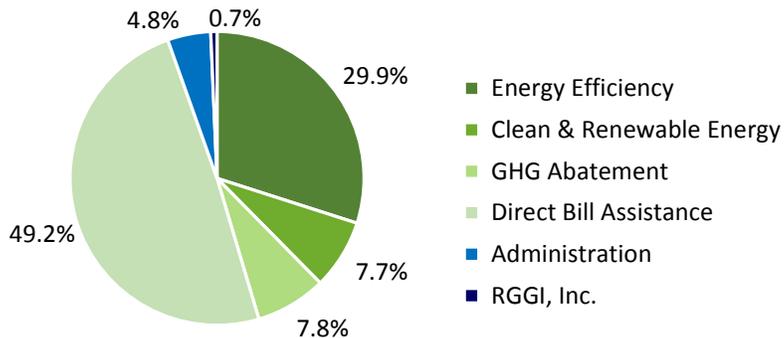
Maryland allocates proceeds from the sale of CO<sub>2</sub> allowances into the State's Strategic Energy Investment Fund (SEIF)—a special, non-lapsing fund administered by the Maryland Energy Administration (MEA). MEA deploys SEIF funds to promote affordable, reliable, and clean energy across all of 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 significantly reduced the energy costs of Maryland's businesses.

**Maryland RGGI Investments by Category**

2017

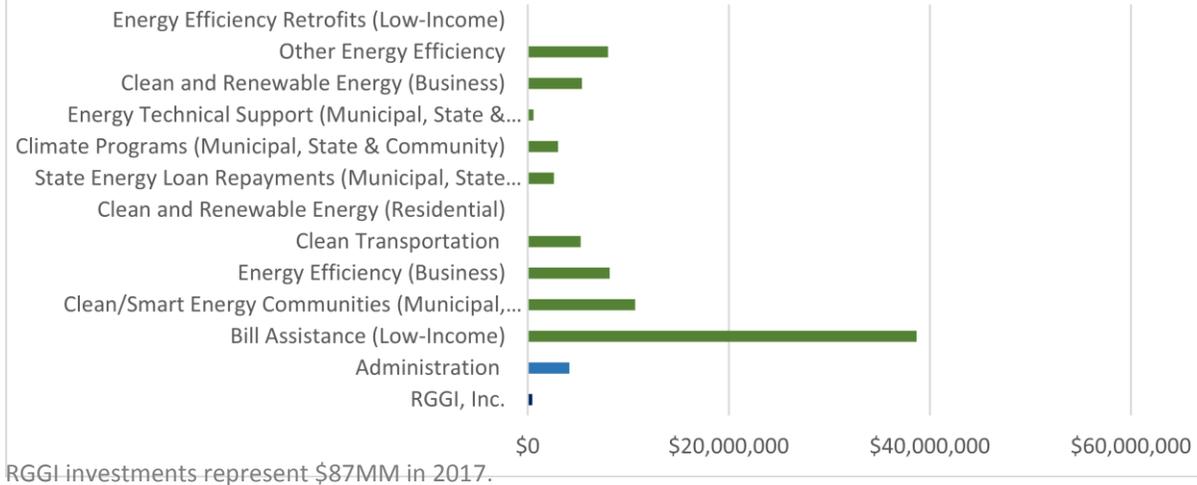


All-Time



Maryland received \$569MM in proceeds from 2008-2017. RGGI investments represent \$87MM in 2017, and \$541MM cumulatively. \$28MM is committed to 2018 and future programs.

## 2017 Maryland RGGI Investments by Recipient



### Program Highlight: Clean Energy Communities

The Clean Energy Communities program was established in 2010, as part of MEA’s Clean Energy Communities Low-to-Moderate Income Grant Program. It finances energy efficiency projects that benefit low-to-moderate income Marylanders.

### Success Story: Center for Urban Families

As part of its FY2017 portfolio, the program funded refitting of Baltimore’s Center for Urban Families building for energy efficiency, in order to help achieve energy savings and concomitant financial relief. This is a nine-year-old commercial building located in Baltimore, housing an organization with a mission to “strengthen urban communities by helping fathers and families achieve stability and economic success.” An HVAC controls tune-up, air sealing and insulation, and lighting retrofit measures were employed to save an anticipated \$34,158 and 293,526 kWh in electrical energy annually.



Building energy analysis performed by Healthy Neighborhoods, Inc. (HNI), with the assistance of the Baltimore City Department of Public Works Office of Sustainable Energy identified inefficiencies with control logic for the CFUF building’s electric reheat system, which warms up air that has been cooled for the purpose of space cooling and dehumidification. As the cooled and dehumidified air from the

central HVAC system is delivered to each zone in the building, it is warmed up by the electric reheat system to the extent needed to prevent overcooling in a given zone. The reheat system and its control settings could only be accessed manually via a wall-mounted apparatus, and the zone settings were kept at a fixed air flow and temperature set point during operating hours, even in unoccupied rooms. Additionally, while the CFUF community center was built just nine years ago, there were also cost-effective opportunities to increase air sealing and insulation between the wall and ceiling that would decrease the electricity required to cool or heat the building. Finally, energy-intensive light fixtures remained on throughout the building, including rooms that were not in use.

The electric reheat control settings were optimized by installing occupancy sensors to monitor for vacant periods in certain zones, such as meeting rooms. This allowed adjustment of the airflow to unoccupied zones and reduced the need for reheating. The control settings for the electric reheat system were also adjusted to cycle on gas-fired RTUs for space heating under certain scenarios, which added some natural gas usage but also reduced the run time of the more energy-intensive electric reheat. With these control modifications and sensor upgrades, significant net energy savings were realized without any tradeoff in comfort or the usability of the building's rooms. Because empty rooms require less ventilation airflow, occupancy sensors also provide ventilation energy savings by adjusting air flow when rooms were unoccupied and forcing the Variable Air Volume boxes into standby mode. With the new automated system, the HVAC and ventilation can now even be monitored and controlled by a phone app. This lessens the systems manager's work load and saves energy by allowing the managers to make system changes remotely and then letting them continuously monitor the system for optimal performance. The MEA award also enabled air sealing and insulation to mitigate the energy loss from the lack of insulation, while maximizing the performance of the HVAC system.

The last energy efficiency measure that was applied to the CFUF community center was the lighting retrofit. For each light fixture, the LMI grant facilitated the exchange of old and inefficient lightbulbs with LEDs and attached a sensor to measure ambient (natural daylight) lighting. The new fixtures were brighter and had dimming capabilities, allowing fixtures near windows to be dimmer than those in areas lacking natural light, saving energy while maintaining light levels.

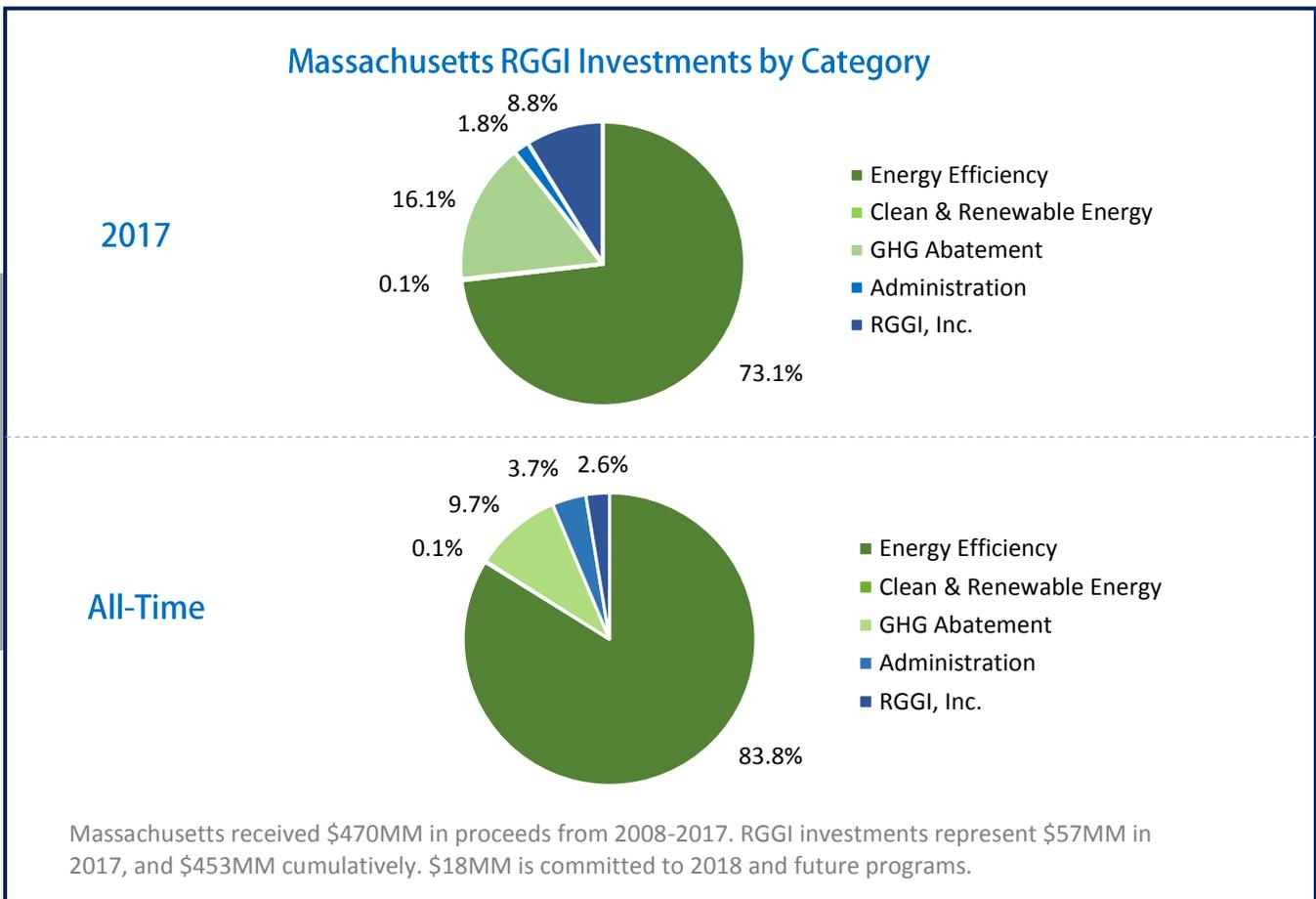
## Resources:

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

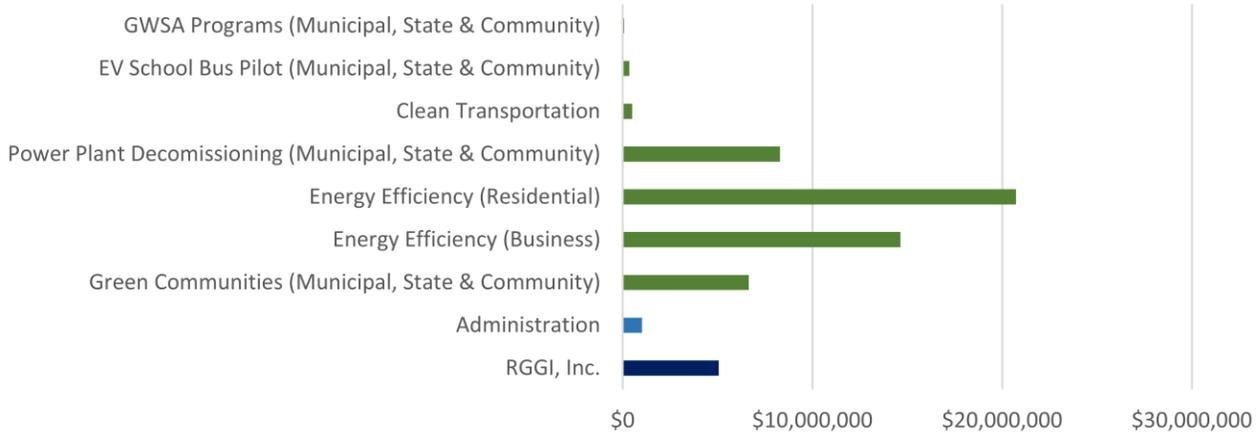
# Massachusetts

Since 2008, Massachusetts has invested more than \$453 million in RGGI proceeds towards strategic programs and initiatives to advance the Commonwealth’s energy goals. 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 affected by 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. These plans, under the Mass Save® brand, 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 supports a variety of other programs, from Massachusetts’ Green Communities, focused on implementing clean energy projects and energy efficiency improvements, to incentive programs for electric and plug-in hybrid vehicles.



## 2017 Massachusetts RGGI Investments by Recipient



Massachusetts RGGI investments represent \$57MM in 2017.

### Program Highlight: Street Lighting Conversion

Massachusetts Department of Energy Resources offered a grant to communities that receive their power from Municipal Light Plant (MLP) systems to encourage retrofits of inefficient street lighting to Light Emitting Diodes (LED). LED fixtures offer a number of benefits to the community including improved visibility, decreased energy use, low operation and maintenance costs, and reduced light pollution. The grant funded a 50% cost share of projects that undertook to replace functional roadway lighting owned by the municipality. The grant covered only material cost, and the municipal utilities supplied the labor to complete the installations. The grant set minimum acceptable criteria for the type of lights to be included and encouraged the municipalities to aggregate procurement to maximize material cost savings. Thirty-three communities applied to replace 47,569 streetlights across the Commonwealth. DOER awarded \$5.4 in funds for the projects, which resulted in 13 million kWh savings annually and 3.2MW peak reduction.



*Wellesley Municipal Light Plant Line worker installing energy efficient LED Lighting.*

“Traditional streetlights have a major impact on peak demand during the winter months, with the sun setting earlier and rising later, which increases the demand on our regional energy grid,” said Department of Energy Resources Commissioner Judith Judson. “Our municipal partners across the Commonwealth once again lead the charge for greater energy efficiency that resulted in reduced costs, usage, and emissions across Massachusetts.”

### Continued Success Story: MOR-EV (Massachusetts Offers Rebates For EVs)

Since 2014, MOR-EV, a consumer rebate and awareness raising program, has used RGGI funds to promote the use of zero-emission vehicles (ZEVs) by offering consumer rebates, and by increasing

consumer and dealer awareness of electric vehicles.<sup>5</sup> In the 2016 RGGI report, DOER highlighted MOR-EV as a success story. This section follows up with a discussion of continued achievement.

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 \$3 million was paid towards 1,638 vehicle rebates in 2016, increased to \$5 million for 3,030 rebates in 2017. This RGGI-funded program has provided Massachusetts substantial savings, environmentally as well as economically. A 66% increase in funding has led to an even greater percentage increase in benefits, as shown below.

**Environmental Impact:** GHG avoidance for new purchases rebated in 2017 was 10,000 short tons. The annual 2017, avoided GHG emissions from all program rebated vehicles were in excess of 21,000 short tons. The cumulative MOR-EV program emissions savings were 39,702 short tons by the end of 2017. Lifetime GHG reduction for 2017 acquired vehicles will be an estimated 150,158 short tons.

**GHG Emissions Avoided (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)
2016	5,658	11,137	18,555	84,864
2017	10,011	21,147	39,702	150,158
% Increase	77%	90%	114%	77%

**Economic Impact:** Accounting for fuel savings, operating cost savings and petroleum, GHG and air pollutant externality savings, the 2017 purchased MOR-EV vehicles saved \$5 million in the initial year of purchase. All vehicles rebated during the life of the program collectively saved over \$10.5 million in 2017. The cumulative program savings was more than \$19.6 million at the close of 2017. Lifetime savings for 2017 purchases is projected to be over \$76 million.

**Economic Savings**

	\$ 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)
2016	\$2,799,430	\$5,482,280	\$9,100,580	\$41,991,450
2017	\$5,088,958	\$10,571,238	\$19,671,818	\$76,334,370
% Increase	82%	93%	116%	82%

**Resources:**

- <https://mor-ev.org/>
- <https://greet.es.anl.gov/afleet>

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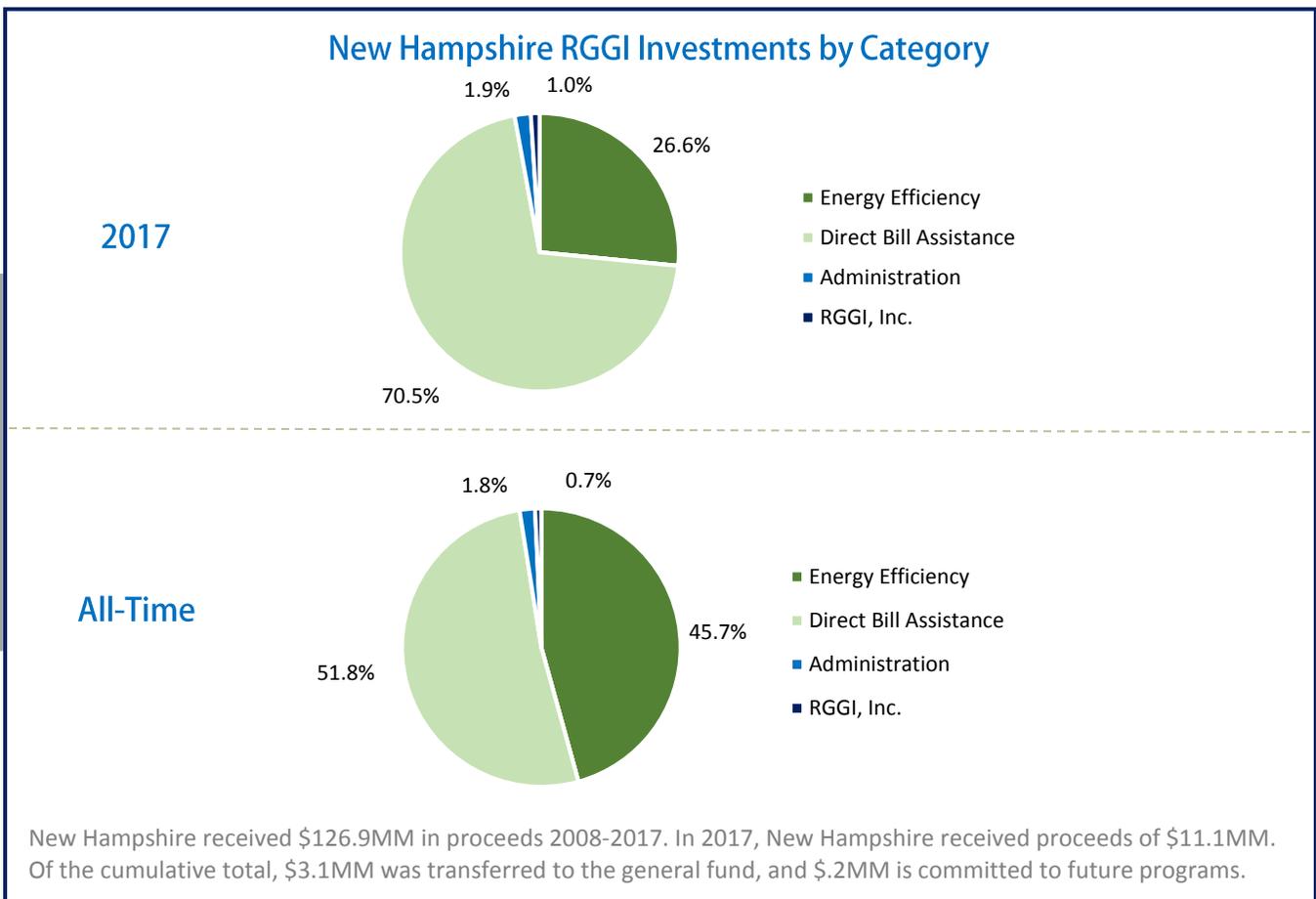
<sup>5</sup> For historical 2014 and 2015 calculations, please see the 2016 RGGI Report

# New Hampshire

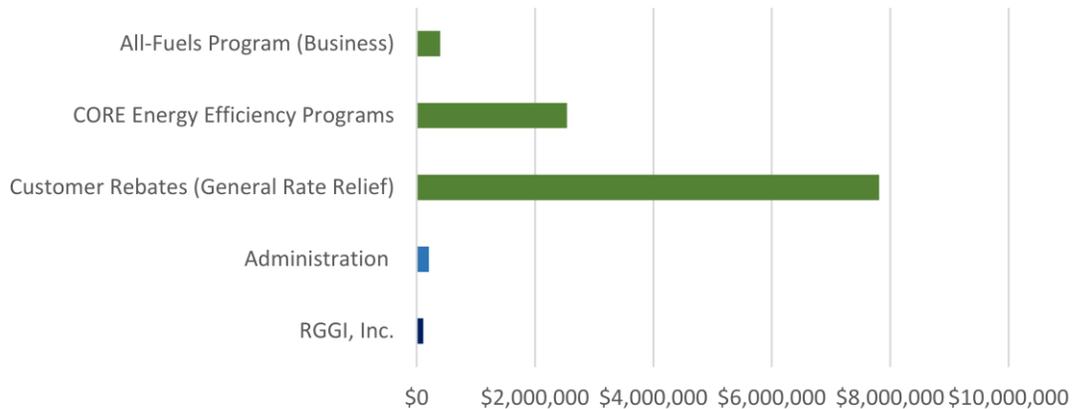
In 2017, New Hampshire received approximately \$11.1 million in RGGI allowance proceeds. Of the \$11.1 million, New Hampshire allocated approximately \$3 million to its Energy Efficiency Fund (EEF), which in combination with the System Benefits Charge, funds energy efficiency programs administered by the state’s four electric utility companies. Approximately \$7.8 million was used to provide direct bill assistance to New Hampshire electric consumers, and the remaining RGGI auction proceeds of approximately \$0.3 million covered RGGI-related administrative expenses.

The state’s electric utility companies’ energy efficiency programs include: a Municipal program; an income-eligible Home Energy Assistance program; and an All-Fuels program. In 2017, energy efficiency funds were used to accomplish the following:

- Weatherized 92 income-eligible homes;
- Installed energy efficiency measures and efficient equipment in 155 municipal facilities;
- Implemented energy efficiency measures and installed energy efficient equipment in 268 retail and large businesses; and
- Financed 19 residential energy efficiency projects utilizing consumer loans from the RGGI-funded Revolving Loan Fund (RLF).



## 2017 New Hampshire RGGI Investments by Recipient



New Hampshire RGGI investments represent \$11.1MM in 2017.

### Program Highlight: Efficiency Programs

The Home Energy Assistance and Municipal programs will save ~87,564 MWh of electricity and 133,407 MMBtu over the expected life of the equipment improvements made in 2017. Associated bill savings over the lifetime of these improvements is estimated to be \$16.9 million.<sup>6</sup> The All-Fuels program will save approximately 463 MWh of electricity and 214,500 MMBtu over the expected life of the efficient equipment improvements made in 2017. Associated bill savings over the lifetime of these improvements is estimated to be \$4.6 million.<sup>7</sup> The All-Fuels program was launched in 2016. Over a three-year period (2016-2018), the program is estimated to receive \$1.2 million of RGGI funding. The All-Fuels program targets energy efficiency measures for retail businesses and large commercial and industrial energy users.

On-bill consumer financing continues to be available through a revolving loan fund, first funded by a RGGI grant awarded to the state's electric utilities in 2009. The loan fund continues to offer zero-interest loans. As loans are repaid, funds become available for new loans. In 2017, 19 new residential projects were financed utilizing RLF funds, with an average loan amount of approximately \$1,600.

### Success Story: Contemporary Automotive

*Contemporary Automotive* in Milford, New Hampshire, is living up to its name with a new sustainable showroom and service facility. The owners wanted their new dealership to be a model of sustainable best practices and included low-flow plumbing, drought-resistant native plant life, reclaimed motor oil for

<sup>6</sup> Total estimated savings of \$16.9MM include electric kWh savings of \$14.1MM and \$2.8MM for fossil MMBtu savings.

<sup>7</sup> Total estimated savings of \$4.6MM include electric kWh savings of \$74,000 and \$4.5MM for fossil MMBtu savings.

radiant heating, a solar array, and energy efficiency measures included in the pre-schematic stage of the building's design to optimize savings.

The building is cooled with energy-efficient electric heat pumps and heated with an oil furnace. A nearly \$34,000 RGGI grant enabled enhanced under-slab and roof insulation resulting in approximate savings of 21,000 gallons of heating oil, 4,450 gallons of liquid propane, and 11,200 kWh over the anticipated 25-year lifespan of the insulation. Additionally, a separate \$27,000 incentive offset the cost of 238 interior and 92 exterior high-efficiency LED lighting fixtures and occupancy sensors, resulting in a lifetime savings of more than seven million kilowatt-hours. These highly efficient and long-lasting LEDs reduce replacement and maintenance costs as well.

With the RGGI grant, *Contemporary Automotive* was able to look at the new construction project comprehensively. Altogether, the lifetime benefits of the energy efficiency measures will result in avoided CO<sub>2</sub> emissions of about 268 tons, the equivalent of taking about 61 cars off the road for a year or planting nearly 67 trees. The solar array received a \$64,935 incentive from the state's Renewable Energy Fund, which provides support to electrical and thermal renewable energy initiatives.



*Photo courtesy of Contemporary Automotive*

## Resources:

1. [Energy Efficiency Program Regulatory Webpage](#)
2. [2018 System Benefits Charge and RGGI Results Report](#)

## New York

New York's leadership helped to establish RGGI as North America's first mandatory, market-based program to reduce carbon emissions. The state builds off RGGI's success through its Clean Energy Standard and the ten-year, \$5 billion Clean Energy Fund to reduce greenhouse gas emissions 40% from 1990 levels by 2030 and no less than 85% by 2050 toward economy-wide carbon neutrality. These complementary state strategies work under the regional cap established by the RGGI states, all of which support beneficial electrification and decarbonization of New York's economy (see graphic below). RGGI investments fill gaps or pursue specific opportunities for clean energy, energy efficiency, and carbon reduction that other state activities are not currently designed to reach.

Across the state, New Yorkers are eagerly taking advantage of the opportunities afforded by RGGI. RGGI supported the launch of the Clean Energy Communities program in 2016. One year later, more than 120 New York communities had received the Clean Energy Community designation. In 2017, the state launched its Drive Clean electric vehicle rebate program, issuing more than 4,500 rebates by year's end.



The NY-Sun program continued to generate success and launched a fourth round of Solarize (Community Solar NY) in the fourth quarter of 2017. The program also awarded eight applicants with pre-development and technical assistance funding to support low-to-moderate income community solar development.

RGGI also supports works to advance next generation clean energy technologies. New York's 76 West Competition, one of the largest clean energy business competitions in the country, uses RGGI funds to provide financial support for innovative clean energy businesses to locate and expand operations in New York's Southern Tier. The competition's second round was held in 2017, with the \$1 million top prize going to Texas-based Skyven Technologies for its solar thermal technology designed for cooler climates and low-heat processes like pasteurization.

### Program Highlight: Drive Clean Electric Vehicle Rebate Program

The transportation sector represents the largest single source of greenhouse gas emissions in New York. New York is actively working to drive down the sector's greenhouse gas footprint as a signatory of the Zero Emissions Vehicle MOU and by adhering to California's vehicle tailpipe standards. In March 2017, New York introduced another tool to reduce its greenhouse emissions: The Drive Clean Rebate for Electric Vehicles. Part of the state's Charge NY initiative, the \$55 million program provides four rebate levels, up to \$2,000, at the point of sale and will drive greater emission reductions by fostering an estimated 40,000 additional EV purchases. By December 2017, NYSERDA had issued over 4,500 rebates, bringing the state from about 16,500 electric vehicles at the beginning of the year to over 24,500 by year's end.

### Success Story: New York Communities Go Clean

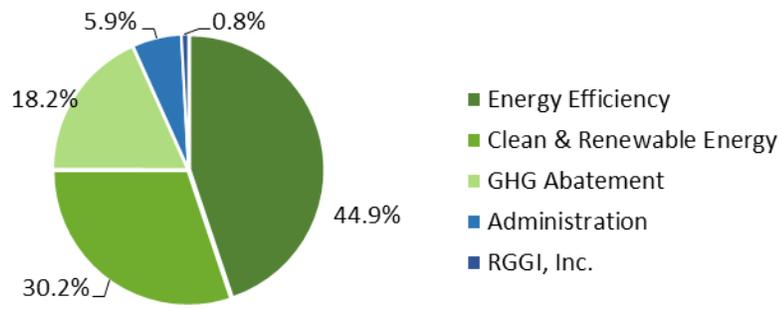
One need not look further than NYSERDA's Clean Energy Communities program for evidence of the increasing demand for and attractiveness of clean energy solutions in New York. Established as a

successor to the previously successful Cleaner Greener Communities program and a complement to the Climate Smart Communities program, the Clean Energy Communities program encourages localities across the state to take high impact actions to increase the prevalence of clean energy. By the end of 2017, 289 communities from across the state completed over 811 clean energy actions. 123 communities completed four of the ten High Impact Actions, receiving the Clean Energy Community designation and eligibility for a grant of up to \$250,000 to support further clean energy activities by the municipality.

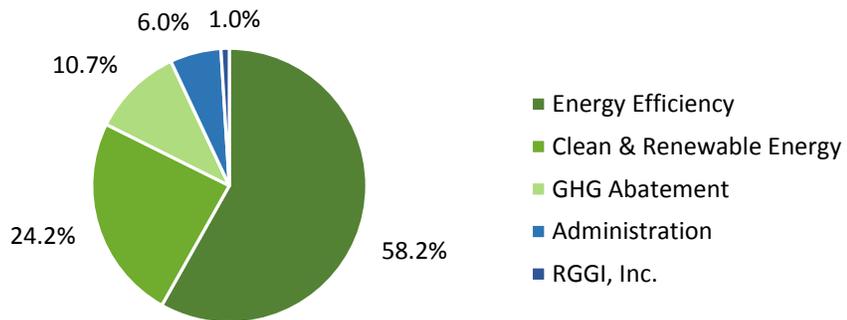
Further clean energy adoption will be encouraged by programs like the Community Energy Engagement program. This statewide, RGGI supported-program bolsters engagement by local community-based organization with residents, local business, and multi-family building owners to increase awareness of and implementation of affordable clean energy services and solutions.

### New York RGGI Investments by Category

2017

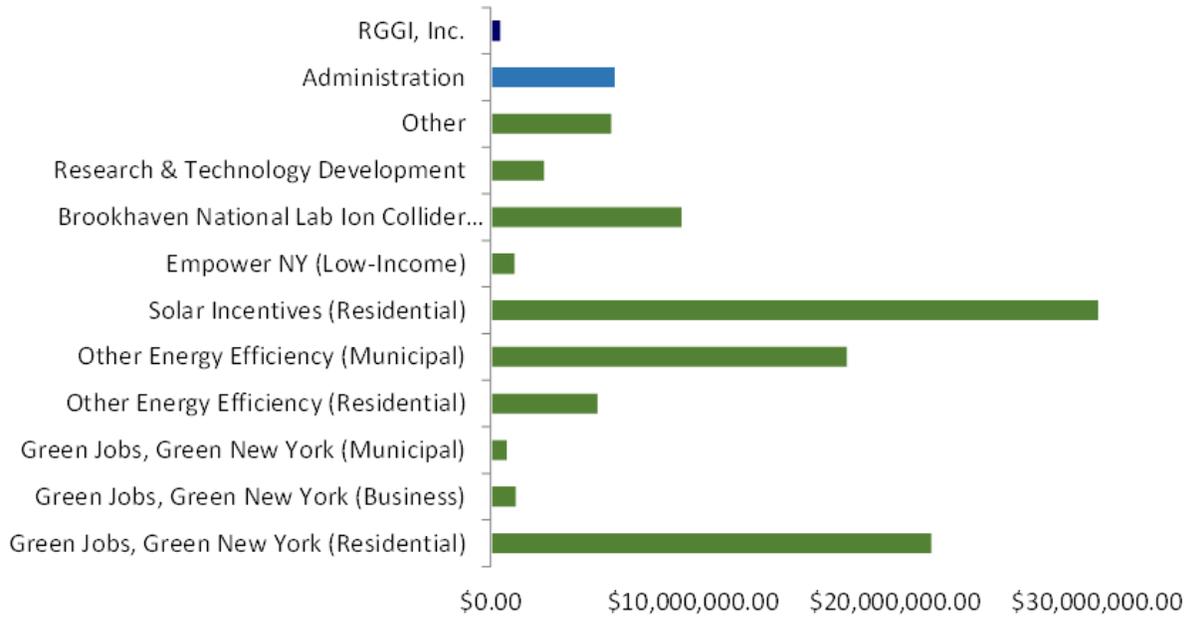


All-Time



New York received \$1.07B in proceeds from 2008-2017. RGGI investments represent \$105MM in 2017, and \$920MM cumulatively. \$62MM is committed to 2018 and future programs.

### New York RGGI Investments by Recipient



New York RGGI investments represent \$105MM in 2017.

### Resources:

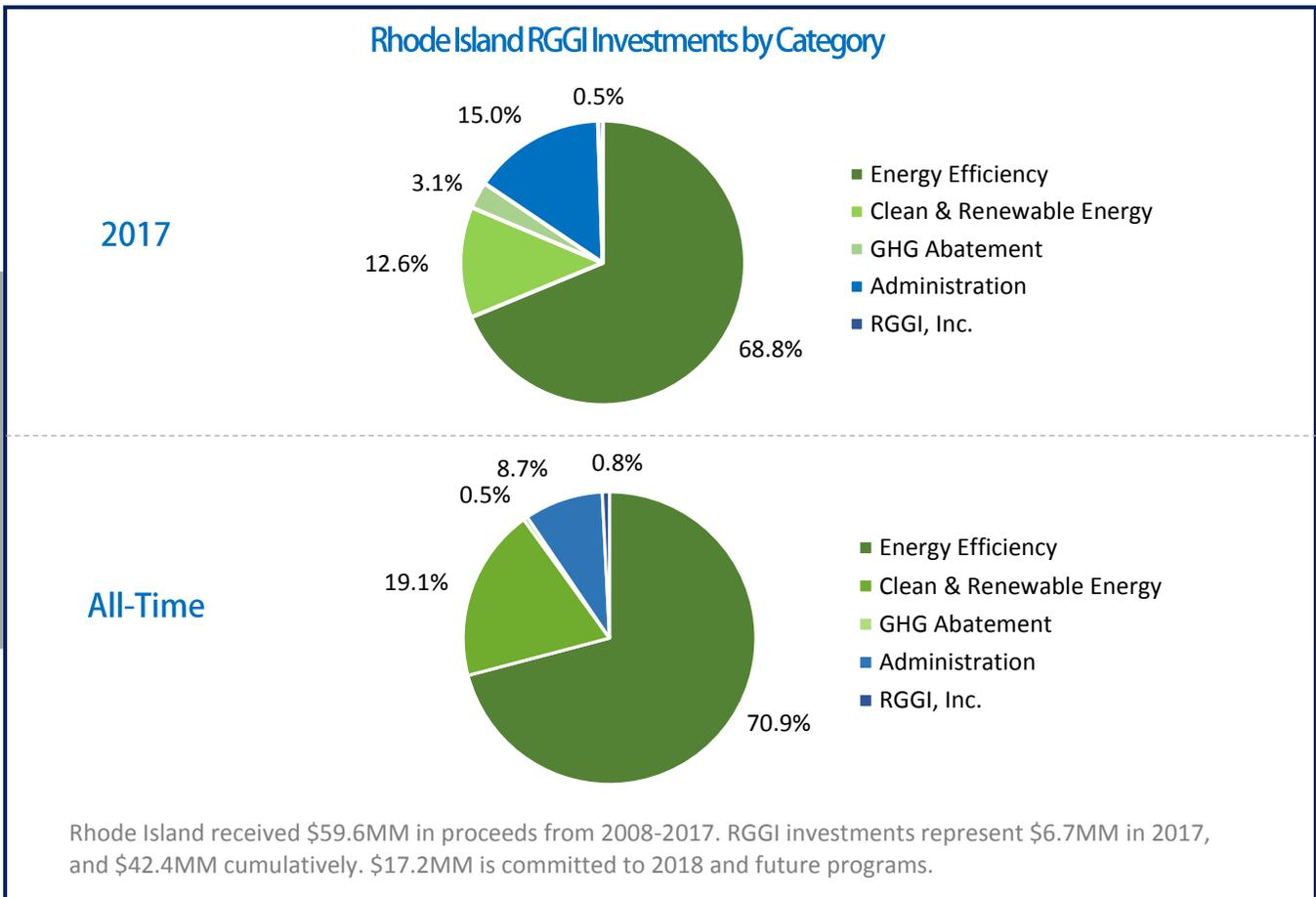
- [2016 and 2017 RGGI Operating Plan](#)
- New York's Regional Greenhouse Gas Initiative-Funded Programs Status Report Quarter Ending December 31, 2017 (available from [NYSERDA](#))

# Rhode Island

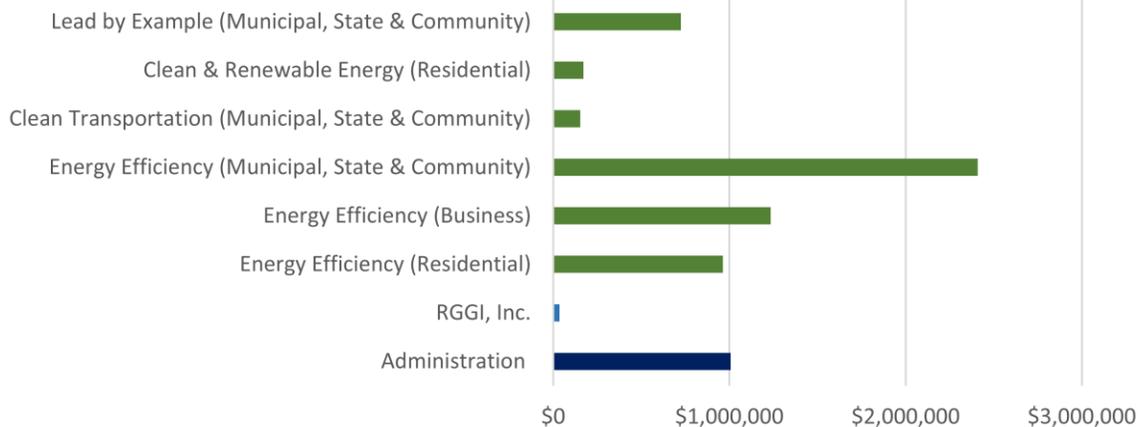
RGGI auction proceeds are allocated by the state’s Office of Energy Resources (OER) to drive investment in – and expansion of – clean energy resources, including cost-effective energy efficiency and renewables. In doing so, OER seeks to support investment and job growth in Rhode Island’s burgeoning clean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

RGGI auction proceeds are accelerating 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 2017, Rhode Island RGGI proceeds were primarily allocated to energy efficiency and renewable energy programs. Proceeds were allocated to the state 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 cost-effective investments. In addition, proceeds were allocated to the RI Department of Transportation for the replacement of state-owned highway street lights with more cost-effective LED fixtures and lighting controls.



### 2017 Rhode Island RGGI Investments by Recipient



Rhode Island RGGI investments represent \$6.7MM in 2017.

OER also invested funds in the following programs:

- The Municipal Streetlights program, which enhanced incentives for municipalities to convert local streetlights to high-efficiency LEDs;
- The Rhode Island Public Energy Partnership, a collaborative effort to achieve deep energy savings in state and municipal facilities;
- Local investments in energy efficiency projects in the Pascoag Utility District;
- The Rhode Island Solarize program, which seeks to increase the adoption of small-scale solar electricity in participating communities;
- Energy efficiency projects in the Town of New Shoreham (Block Island);
- The Energy-Savings Trees program, which distributes trees to homeowners that can be strategically planted on their property and result in saving energy and lower utility bills;
- A System Reliability Procurement Distributed Generation Pilot (Evaluation Report), which explored 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;
- Energy efficiency rebates for homes heated with deliverable fuels (oil and propane); and
- A Renewable Thermal Market Development Strategy Report, which considered benefits, impacts, barriers, and opportunities to promote “renewable thermal” technologies in Rhode Island.

### Program Highlight: Lead by Example

In 2015, the Governor issued Executive Order 15-17, which directs state agencies, cities and towns, quasi-public agencies, and state colleges and universities to “Lead by Example” by becoming more energy efficient and sourcing more of their power through renewable energy technologies, such as solar and wind.

Lead by Example projects funded with RGGI dollars have included: Capitol Hill solar project, RI Veterans Home in Bristol, installation of solar lights at Department of Environmental Management properties, the LED retrofit of exterior/interior lighting at the Department of Administration building, the RI State House boiler replacement, and an energy efficiency project at Pastore Complex.

## Success Story: One Capitol Hill Solar Project



*Photo courtesy of the Rhode Island Office of Energy Resources*

Providence-based Newport Renewables installed net-metered solar arrays on the Department of Administration, Department of Health and Department of Transportation building's rooftops. The three solar arrays have a total of 900 solar panels and will offset 350,000 kWh.

"This project is a testament to what can happen when we all work together for a greener future," said Governor Raimondo. "Renewable energy is the future of energy in Rhode Island. With our Lead by Example initiative, state agencies and municipalities have been encouraged to take on clean energy projects that reduce costs and shrink our carbon footprint – all while creating jobs."

"Not only will the solar arrays decrease the energy use and operating costs of each building, they will decrease Rhode Island's environmental footprint, and serve as great examples for other government entities, businesses and homeowners looking to invest in a clean energy future," said Stuart Flanagan, co-founder and principal of Newport Renewables.

## Resources:

- [Rhode Island RGGI Auction Proceeds Allocation Plans](#)
- [Rhode Island Government Press Release April 2018](#)

## Vermont

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Vermont invests the majority of its CO<sub>2</sub> 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 2017 are estimated to result in lifetime energy savings of 3.4 million MMBtu. These programs are estimated to avoid the emission of over 200,000 short tons of CO<sub>2</sub>, and to save participants over \$95 million on their energy bills over the lifetime of those investments. Vermont's RGGI-funded programs have served approximately 9,950 households and 564 businesses.<sup>8</sup> Programs currently supported by CO<sub>2</sub> allowance proceeds include the Home Performance with ENERGY STAR® (HPwES) 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.

Efficiency Vermont, the nation's first ratepayer-funded energy efficiency utility, is overseen by the Vermont Public Utility Commission, and implemented by VEIC. 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 fourth in the nation in 2017, according to the American Council for an Energy Efficient Economy (ACEEE) State Energy Efficiency Scorecard.

### Program Highlight: Home Performance with ENERGY STAR

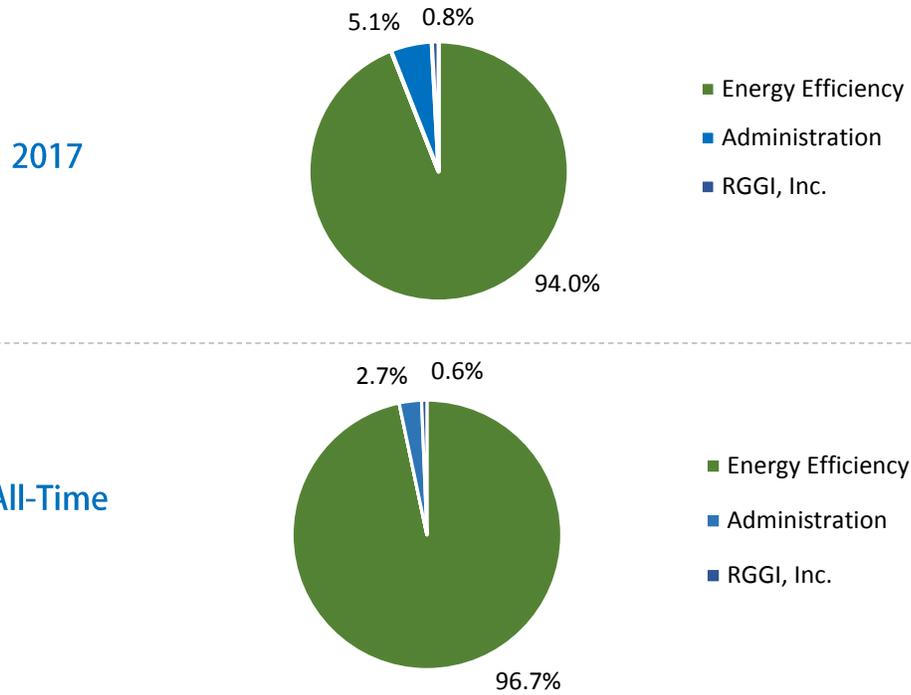
The Efficiency Vermont Home Performance with ENERGY STAR service is an incentive-based program for single-family Vermont residences to lower utility bills and increase home comfort and safety by installing insulation, air sealing, ventilation, and heating systems improvements. Vermonters can access comprehensive thermal efficiency retrofits, incentives to offset project costs, and low-no interest rate financing. Customers hire a participating Efficiency Excellence Network Home Performance with ENERGY STAR contractor. This allows customers to receive incentives up to \$2,000, ensures the contractor meets eligibility requirements, and provides quality assurance.

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.

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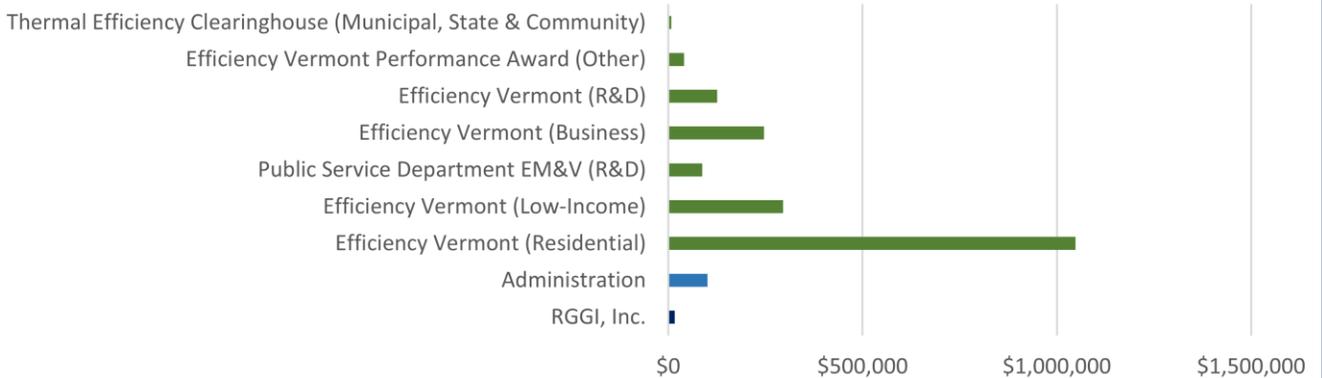
<sup>8</sup> Please note, the 2017 figures reported here for mMBTU lifetime energy savings and energy bill savings are less than results reported in the 2016 report. This is the result of correcting historical data inputs to more accurately reflect the cumulative benefits of thermal energy and process fuel efficiency programs funded by RGGI.

### Vermont RGGI Investments by Category



Vermont received \$21.4MM in proceeds from 2008-2017. RGGI investments represent \$1.9MM in 2017, and \$20.6MM cumulatively. \$.8MM is committed to 2018 and future programs.

### 2017 Vermont RGGI Investments by Recipient



Vermont RGGI investments represent \$1.9MM in FY17.

Home Performance with Energy STAR is a national brand managed by the U.S. Department of Energy (U.S. DOE). Across the US, 50 organizations sponsor local programs under this brand. Although local programs differ, they follow the same basic structure 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: Weatherize Upper Valley Campaign



Throughout Vermont, community spirit has long been a source of pride, whether at times of need or celebration. In the winter of 2017, that spirit brought residents together in 14 towns in the Upper Valley region to help improve the energy efficiency of area homes. The Weatherize Upper Valley Campaign was designed by Vital Communities, a nonprofit that cultivates civic, environmental and economic vitality in the Upper Valley. In partnership with

Efficiency Vermont, the campaign brought local volunteer teams together with local home performance contractors, inspiring residents to improve their homes' efficiency through outreach and incentives. As a result, 80+ homes received financial and technical support to stay warmer using less energy.

With encouragement from volunteers, residents attended "meet-the-contractor" events, signed up for free home energy assessments, and received reports with energy efficiency recommendations. Local volunteers then followed up with homeowners. Efficiency Vermont provided financial incentives and support in the form of customer and contractor rebates, as well as technical and logistical support. As a result, over 190 home energy assessments were conducted; over 80 Home Performance with Energy Star projects were completed; and 1,065 MMBtu savings were achieved.

"Having Efficiency Vermont at the table with us from day one was essential to our success. Efficiency Vermont staff participated in our program design process, assisted us in connecting with partner contractors, and worked with us to track the results of energy efficiency projects completed by participants as a result of our campaign. It was always our shared intention to test creative, community-based marketing strategies that would later inform statewide programs. We are excited to continue our close partnership with Efficiency Vermont on this and other projects in the years to come." -Sarah Brock, Energy Program Manager, Vital Communities

In addition to these metrics, this campaign's success was reflected in how grassroots community engagement and partner collaboration combined to reduce energy usage, protect health and expand comfort, serving as a model for future campaigns statewide.

### Resources:

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

# Glossary and Methodology

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## 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 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 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 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 2017 and beyond.

### **Current Period**

The twelve-month period covered by this report, which may be either the fiscal year or calendar year 2017, as defined by each state.

## **Benefits and Statistics**

### **Annual (2017)**

A measure of one year's worth of benefits from all measures installed in 2017. Note that actual realized benefits in the year 2017 may differ slightly from the 2017 annual benefits, since measures may be installed at different times during the year.

### **Lifetime (2017)**

The full benefits of measures installed in 2017, 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 2017 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.

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

Estimated total number of short tons of CO<sub>2</sub> 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 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: <https://www.epa.gov/energy/greenhouse-gases-equivalencies-calculator-calculations-and-references>.

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