



REGIONAL GREENHOUSE GAS INITIATIVE (RGGI): AN EMISSIONS TRADING CASE STUDY



Regional Greenhouse Gas Initiative

The World's Carbon Markets: A Case Study Guide to Emissions Trading

Last Updated: April 2015

Third Compliance Period (2015-17)	
Projection	More than 45% reduction in CO ₂ emissions from the power sector by 2020 relative to 2005 emissions
Cap	RGGI 2015 adjusted cap is 66.8 million short tons (60.63 million tCO ₂)
Carbon price	\$4.78 (2014), \$5.41 (Q1 2015)
Greenhouse Gases covered	CO ₂
Number of Entities Covered	168
Sectors Covered	Fossil fuel power plants
Threshold	>25 Megawatts
Compliance tools & Flexibility mechanisms	Free allowances, auctioning, use of offsets (up to 3.3%), Banking, floor price (\$2.05), reserve adjustment (10 million short tons, 9.1 million tCO ₂), three-year compliance period

Table 1: Program Overview

Brief History and Recent developments

Year	Event
2005	Memorandum of understanding issued
2007	Maryland Massachusetts and Rhode Island join ETS
2008	Original Model Rule Adopted
2008	First Allowance Auction
2009	First Control Period begins (188 million short tons of CO ₂)
2011	New Jersey Withdraws (effective start of 2012)
2012	Second Control Period begins (165 million short tons of CO ₂)
2012	Program review
2013	Updated Model Rule Adopted
2014	New Cap Compliance begins (adjusted cap of 83 million short tons of CO ₂)
2015	Third Control Period begins (adjusted cap of 67 million short tons of CO ₂)
2016	Next program review
2017	End of the Third Control Period
2020	Projected power sector CO ₂ emissions reduction of 45 % relative to 2005 levels

Table 2: Brief History and Key Dates

Source: See "Fact Sheet: RGGI CO₂ Allowance Auctions" Published by RGGI Inc. Available at: rggi.org

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort among nine Northeastern and Mid-Atlantic states to reduce carbon dioxide (CO₂) emissions from the electric power sector. RGGI is the first mandatory trading program that caps CO₂ emissions in the US through state coordinated cap-and-trade programs.

In 2014, the RGGI member states accounted for 13.1% of the US population¹ and 16% of US GDP.² In 2012 RGGI states were accountable for 7% (479 million tonnes CO₂)¹ of total US GHG emissions (6,526 million tCO₂), of which 83.1 million tCO₂ were emitted via electric power generation facilities from fossil fuel combustion.³ RGGI states have seen a significant decline in CO₂ emissions from the power sector since 2010 (12.4 million tCO₂). Although RGGI ranks among the top 20 ETSs globally in terms of aggregate coverage, its contribution to global GHG emissions reduction is relatively small.⁴

RGGI was developed over several years, beginning in late 2003, to address the risks associated with climate change.⁵ On 20 December 2005, seven states (Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York and Vermont) issued a Memorandum of Understanding (MOU) that explained the overall goal of RGGI: to create a cap-and-trade program aimed at stabilizing and reducing emissions in participating states, while remaining consistent with overall economic growth and the maintenance of a safe and reliable electric power supply system.⁶ This MOU outlined the framework for a Model Rule⁷ which informs state practice. Massachusetts and Rhode Island signed the MOU in January 2007 after participating in the early development of RGGI, and Maryland joined the program in April 2007 after an amendment to the MOU.⁸ RGGI's first auction of CO₂ allowances was held in 2008, and the first compliance period began on 1 January, 2009.

New Jersey withdrew from RGGI at the end of 2011;⁹ however, in March 2014, the Appellate Division of the New Jersey Superior Court ruled that the manner in which the state withdrew had violated procedural requirements under

¹ Short Tons have been converted to Metric Tons (where 1 short ton=0.90718474).

state law. The court directed the state to undertake the required public-comment procedures within 60 days of the court ruling, but there have been no recent announcements regarding the return of New Jersey to RGGI.¹⁰ Currently, Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont participate in RGGI.

RGGI is composed of individual, state-level CO₂ cap-and-trade programs that permit allowance trading between member states. In 2006 RGGI established the Model Rule, a framework that allows member states to establish their own cap-and-trade program. The state regulations based on the Model Rule set limits on in-state CO₂ emissions from electric power plants, issued CO₂ allowances, and established state participation in regional CO₂ allowance auctions.¹¹

As outlined in the MOU a comprehensive 2012 program reviews:

- evaluated the environmental success of RGGI,
- evaluated the impact of RGGI on electricity price and system reliability,
- considered whether to consider any additional reductions, and
- evaluated offsets including price, availability and environmental integrity.¹²

RGGI completed its program review with the release of an updated Model Rule on 7 February, 2013 along with a Summary of Recommendations to accompany the updated Model Rule.¹³ Each of the nine RGGI states adopted the Model Rule amendments; seven through regulatory updates and two (Maine and New Hampshire) with legislation.¹⁴ The updated Model Rule took effect on 1 January, 2014. The next review is scheduled to take place in 2016 and will consider further emission reductions post-2020.¹⁵

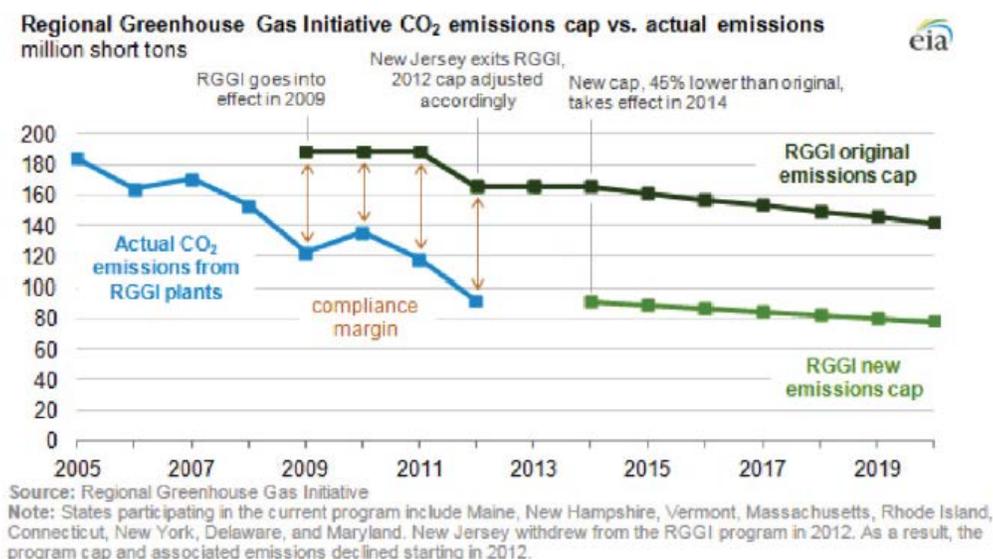


Figure 1: RGGI CO₂ Emissions Cap Against Actual Emissions

Source: US Energy Information Administration, 2014. Available at: eia.gov

In addition to RGGI's cap-and-trade compliance protocols, member states may in the future have to comply with recently proposed federal emission targets under the Clean Power Plan (CPP). The targets are rate-based and vary by state, but have been estimated to nationally represent a 30% reduction in power sector emissions by 2030 relative to 2005 levels.¹⁶ The Environmental Protection Agency (EPA) proposed the CPP on 2 June 2014, under the existing legal authority of The Clean Air Act section 111(d), to establish a regulation to limit CO₂ pollution from existing power plants nationwide.¹⁷ Under the proposed plan, the EPA would establish a carbon intensity target for each state which

would be applicable to their domestic industrial facilities. State reduction targets will be based on a national formula, calculated with state and regionally specific information (with fixed interim goal and a final reduction targets). The proposed CPP allows flexibility in compliance, offering:¹⁸

- a wide timeline, up to 15 years from guidelines issuance to fully implement all emission reduction measures by 2030,
- a choice in the nature of the goal, between using a rate-based and a mass-based goal,
- a choice in the nature of the plan, between using a single and multi-state plan,
- an array of tools to reduce emissions, allowing states to choose from among a collection of approaches that reflect their particular circumstances and policy objectives. Some of these approaches include (but are not limited to) the following four key “*building blocks*”:
 - 1. Improving efficiency of existing fossil fuel power plants.
 - 2. Shifting generation from high-emitting power plants to lower-emitting units.
 - 3. Expanding use of zero-emitting generating resources, such as renewables and nuclear.
 - 4. Increased end-use electricity efficiency.

Currently the EPA is planning to issue final rules on the CPP for existing power plants as well as setting carbon pollution standards for new, modified and reconstructed power plants by mid-2015.¹⁹ Thereafter, the EPA plans to propose a federal plan for meeting CPP goals which will be open for public review and comment to be finalized by 2016 along with the submissions of complete or initial compliance plans by individual states.²⁰ In areas that do not submit plans, the EPA will issue a final federal plan.²¹ The due dates for compliance plans may be extended upon request; individual states may be permitted a one-year extension and multi-state compliance plans a two-year extension.²² While the CPP is still in the development stages, future regulations may have implications for the already established statewide cap-and-trade regulations within RGGI member states.

Summary of Key Policy Features

CAP/TARGET: RGGI consists of **three-year compliance periods**, the first of which ran from 1 January, 2009 through 31 December, 2011. The MOU set the states’ overall **emissions budget** at 188 million short tons of CO₂ (170 million tCO₂) for the first compliance period. For the second compliance period, which began in 2012, the annual emissions budget was adjusted down to 165 million short tons of CO₂ (150 million tCO₂) in order to account for New Jersey’s withdrawal from the program.²³ The second compliance period ended on 31 December 2014.

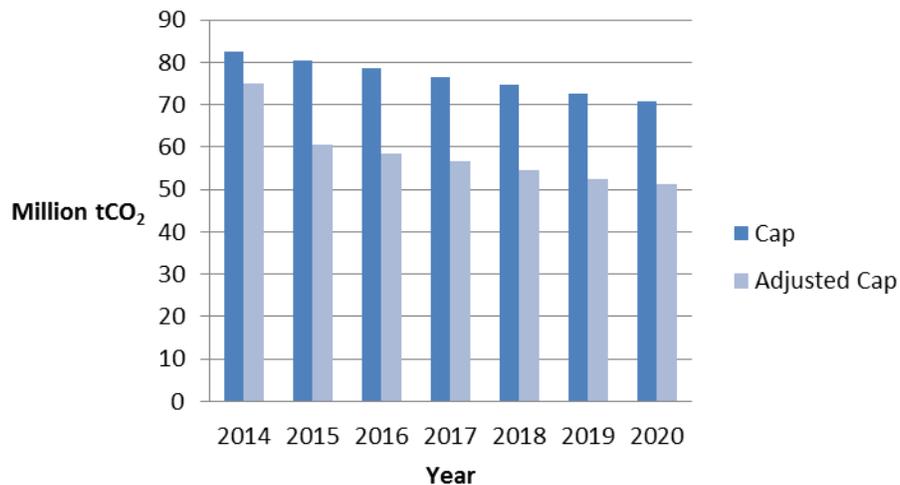


Figure 2: RGGI Cap & RGGI Adjusted Cap 2014-2015

Source: RGGI, 2015. RGGI Design Overview. Available at: rggi.org

Following the comprehensive 2012 review, the updated Model Rule instructed a further decrease in the cap to 91 million short tons of CO₂ (83 million tCO₂) in 2014 (equal to 2012 emissions levels for the RGGI states),²⁴ extended the annual 2.5% cap decline from 2015-18 to 2015-20,²⁵ and included two interim budget adjustments to account for banked allowances.

These adjustments modified the overall emissions budget to account for RGGI allowances that emitters banked during the first and second compliance periods. Soon after the start of RGGI, it became apparent that the number of allowances in the emissions budget was higher than actual emissions. Allowance prices consequently dropped, making it particularly inexpensive to purchase allowances and bank them for use in later periods. While the MOU does allow emitters to bank allowances, the amount of allowances banked by emitters—57 million short tons of CO₂ (51.7 million tCO₂) equivalent, according to one analysis—motivated the RGGI states to propose additional adjustments to the emissions budget in the updated Model Rule.²⁶

January, 2015 marked the start of RGGI's third compliance period. The 2015 cap is almost 89 million short tons of CO₂ (80.49 million tCO₂),²⁷ which was adjusted to 67 million short tons of CO₂ (60.63 million tCO₂)²⁸ after the first and second interim adjustments for allowances banked. The third compliance period will end in December 2017.

In 2015 the RGGI state also started **interim control period and compliance obligations**. The **interim compliance obligation** for a covered entity is at least 50% of its emissions from the previous year.²⁹ Thus, before the end of the first and second year of the compliance period, all covered entities are required transfer allowances equal to 50% of their emissions. At the end of the three-year compliance period, a covered entity must hold allowances equal to 100% of their remaining emissions for the three-year compliance period.

State	Budget (million tCO ₂)	First Control Period Interim Adjustment	Second Control Period Interim Adjustment	CO ₂ Allowance Adjusted Budget	Budget (as a % of total)
Connecticut	5,211,412	482,594	804,577	3,924,241	5.87
Delaware	3,595,236	340,741	568,081	2,686,414	4.05
Maine	28,987,45	268,134	447,031	2,183,580	3.27
Maryland	18,009,359	1,690,413	2,818,240	13,500,706	20.30
Massachusetts	12,813,920	1,201,652	20,033,84	9,608,883	14.44
New Hampshire	42,005,25	388,549	647,785	3,164,199	4.73
New York	31,160,073	2,898,673	4,832,642	23,428,758	35.12
Rhode Island	2,021,072	119,859	199,828	1,701,385	2.28
Vermont	579,625	55,252.08659	92,116	432,257	0.65
TOTAL	80,489,966	7,445,868	12,413,684	60,630,423	100

Table 3: RGGI Adjusted Emission Cap and Allowances Allocation by Member States for 2015

(figures rounded to the nearest whole number)³⁰

Source: RGGI, 2015. Allowance Allocation. Available at: rggi.org

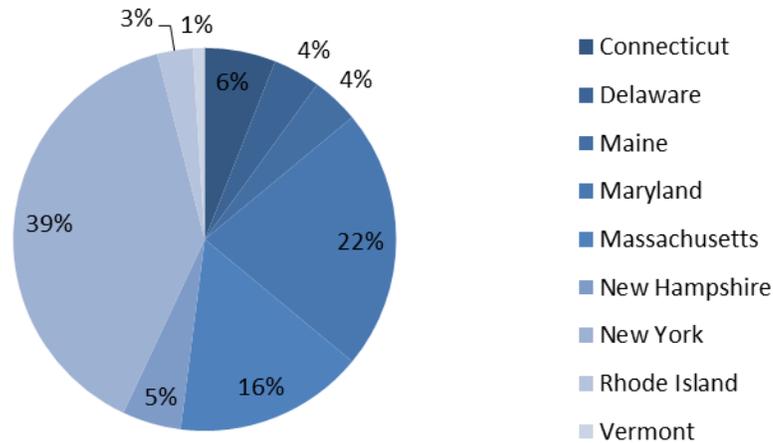


Figure 3: Allowance Allocation Budget by Member States (%)

Source: RGGI, 2015. Allowance Allocation. Available at: rggi.org

The adjustment to each state's budget is determined via a three-step process, according to each state's percentage of the total first control period and second control period bank of allowances. First, by January 15 2014, RGGI calculated an adjustment for each state based on the number of allowances banked during the first compliance period (in 2009, 2010 and 2011). This first adjustment is made over a seven year period from 2014 to 2020. This calculation follows the formula below:

$$\text{FCPIABA} = (\text{FCPA}/7) \times \text{RS}\%$$

where:

- FCPIABA is the state's first compliance period interim adjustment for banked allowances quantity in short tons,
- FCPA is the total quantity of allocation year 2009, 2010, and 2011 CO₂ allowances held in general and compliance accounts, and
- RS% is the state's portion of the overall cap.

Second, by 17 March, 2014, the RGGI states calculated an adjustment for each state based on the number of allowances banked during the first two years of the second compliance period. This second adjustment is made over a six year period from 2015 to 2020. This calculation follows the formula below:

$$\text{SCPIABA} = ((\text{SCPA} - \text{SCPE})/6) \times \text{RS}\%$$

where:

- SCPIABA is the state's second control period interim adjustment for banked allowances quantity in short tons,
- SCPA is the total quantity of allocation year 2012 and 2013 allowances held in ' general and compliance accounts, as of 15 March , 2014,
- SCPE is the total quantity of 2012 and 2013 emissions, as of 15 March, 2014, and
- RS% is the state's portion of the overall cap.

Third, the RGGI states have lowered their emissions budgets to an amount equal to: (1) the calculated FCPIABA for each year from 2014 through 2020 and (2) the calculated SCPIABA for each year from 2015 to 2020. In addition, the updated Model Rule maintains the original 2.5% per year reduction to the RGGI cap for the period from 2015 to 2020.³¹

The updated Model Rule also apportions the overall emissions budget to individual states. Each state’s share remains constant until 2015, when it reduces by 2.5% annually for a projected total reduction of more than 45% in CO₂ pollution from the power sector by 2020 from 2005 levels.³²

In the past RGGI auctions had been undersubscribed; that is, emitters purchased less than 100% of the offered allowances. The RGGI states retained these allowances, but do not intend to reoffer unsold allowances with 2012 or 2013 vintages. Instead, the updated Model Rule gives the option for the RGGI states to retire, or not reoffer, these allowances at the end of the each control period.³³

SCOPE/COVERAGE: RGGI covers CO₂ emissions from fossil fuel-fired power plants located within the RGGI states that meet the threshold of 25MW or greater in size, with the point of regulation at the source of electricity generation. During the first compliance period, RGGI regulated 211 emitters. After New Jersey withdrew from RGGI, the number of regulated emitters dropped to 171. Currently, RGGI regulates 168 facilities.³⁴

By 1 March following the end of each three-year compliance period, every covered emitter must surrender a number of allowances equal to the short tons of CO₂ it emitted over that period.³⁵

The updated Model Rule removed the provision extending the control period to four years.³⁶

AUCTION OVERVIEW: RGGI Inc. makes approximately 90% of RGGI CO₂ allowances available by coordinating quarterly central auctions on behalf of the RGGI states.³⁷ Proceeds from the auctions are distributed to states, which then determine how to spend them. The program is unique in that it is the only cap-and-trade system that auctions the majority of allowances, rather than the more common approach of freely allocating some or all of them. States sell those allowances that are not auctioned off directly to qualifying affected sources or distribute them through set-aside programs.³⁸

Auction	Projected Auction Date	Auction Format	Projected Quantity (million tCO ₂)	Allocation Year*	Cost Containment Reserve (million tCO ₂)
28	3 June, 2015	Sealed bid, Uniform Price	13.8	2015	9.1
29	9 September, 2015	Sealed bid, Uniform Price	13.8	2015	9.1
30	2 December, 2015	Sealed bid, Uniform Price	13.8	2015	9.1

Table 4: Calendar of Auctions 2015 – projected CO₂ allowance auctions (converted to million tCO₂)

Source: RGGI, 2015. CO₂ Auctions. Available at: rggi.org

RGGI auctions **follow a single-round, sealed-bid, uniform-price format, in which** each bidder may submit multiple confidential bids for a specific quantity of allowances at a specific price.³⁹ Auctions are open to all, provided they meet certain criteria e.g. financial security. However, qualified single buyers or groups of affiliated buyers are subject to a **purchase limit** of no more than 25% of the allowances offered at a single auction.⁴⁰

ALLOWANCE DISTRIBUTION: Each state determines how to allocate allowances—either via free allocation or auctions—with two restrictions. First, 25% of allowances, which in practice equates to 25% of auction proceeds, are to be allocated for a consumer benefit or strategic energy purpose. Valid use of these proceeds include promotion of energy efficiency, direct mitigation of electricity ratepayer impacts, promotion of renewable or non-carbon-emitting energy technologies, reward or stimulation of investment in the development of innovative carbon emissions abatement technologies with significant carbon reduction potential, and/or funding administration of the RGGI

program. As mentioned before, in practice, states auction virtually all allowances. Furthermore, in practice, the majority of proceeds from the sale of allowances are allocated toward consumer benefit or strategic energy purposes. The second requirement is that states recognize that, in order to provide regulatory certainty, their specific rules for allocations should be completed as far in advance of the launch of the program as practicable.⁴¹

At the end of the first compliance period, proceeds from auctioned allowances and direct sales equaled roughly \$952 million,⁴² and at the end of 2014, total auction proceeds were calculated at \$1.93 billion.⁴³ Table 5 shows cumulative proceeds after the second control period.

State	Cumulative First Control Period Allowances Sold	Cumulative Second Control Period Allowances Sold	Cumulative Proceeds (\$)
Connecticut	24 343 412	22 338 727	130,554,467.36
Delaware	9 952 619	12 949 207	67,857,838.33
Maine	11 797 376	10 591 027	62,221,516.39
Maryland	74 943 417	75 239 644	418,425,090.90
Massachusetts	62 024 346	56 331 176	330,779,846.93
New Hampshire	14 479 101	14 435 469	80,927,555.23
New York	144 305 904	128 764 643	760,186,645.02
Rhode Island	6 270 050	6 444 140	38,233,979.59
Vermont	2 877 123	2 565 272	15,139,597.73
New Jersey (before its withdrawal)	46 266 477	2 217 293	113,344,551.27

Table 5: Cumulative Allowances and Proceeds (through March 2015)

Source: RGGI, 2015. Auction Results. Available at: rggi.org (allowances sold) rggi.org (proceeds)

States have received, programmed and disbursed virtually all of these proceeds back into the economy through energy efficiency measures, community-based renewable power projects, and assistance to low-income customers to help pay their electricity bills, education and job training programs, and even contributions to a state's general fund.⁴⁴ Figure 4 provides a summary of how states spent these proceeds.

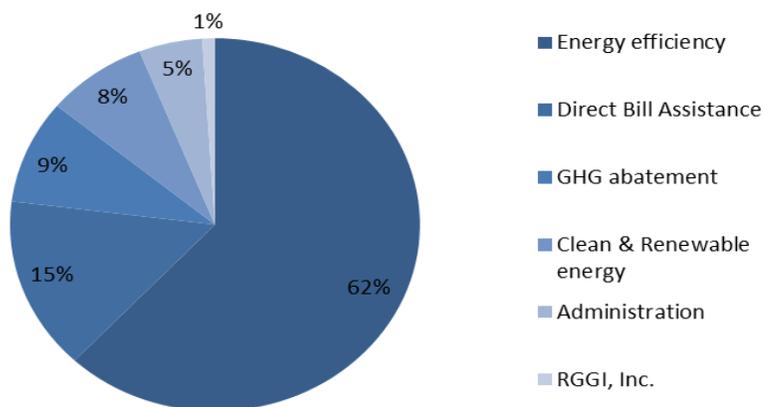


Figure 4: Cumulative RGGI Proceed Spending by Category (2008-2013)

Source: RGGI, 2015. 2013 Investment Report. Available at: rggi.org

FLEXIBILITY PROVISIONS: The current RGGI rules contain several flexibility provisions including the use of offsets, banking and price collars (an auction reserve price and a Cost Containment Reserve). The updated Model Rule modified these flexibility provisions from the original Model Rule in four key ways: it removed offset triggers that gave states the option to raise the allowable percentage of offsets, removed the potential extension of compliance periods, removed the early reduction allowances as they are no longer applicable to the program, and introduced a Cost Containment Reserve (CCR).

The use of **offsets** is limited to 3.3% of a covered entity's reported emissions. RGGI has put in place its own offset protocols and registry for projects based within RGGI jurisdictions, unless an MOU is signed with another state.⁴⁵ The RGGI program currently awards offset allowances for projects that are designed to reduce or sequester emissions of carbon dioxide (CO₂), methane (CH₄), or sulfur hexafluoride (SF₆) within the nine-state region.⁴⁶ Only offset projects within five prescribed project categories are eligible for the award of CO₂ offset allowances:

- Landfill methane capture and destruction
- Reduction in SF₆ emissions in the electric power sector
- Sequestration of carbon due to US forest projects (reforestation, improved forest management, avoided conversion) or afforestation (for CT and NY only),
- Reduction or avoidance of CO₂ emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency in the building sector
- Avoided methane emissions from agricultural manure management operations".⁴⁷

All offset projects are subject to additional eligibility requirements, namely:

- offset projects must consist of actions that are real, additional, verifiable, permanent and enforceable, and
- only reductions that are realized on or after the date of the Memorandum of Understanding (MOU)— 20 December 2005—are eligible for compliance.

The specific requirements for US forest projects were provided in the updated Model Rule, and largely follow the US Forests methodology approved by the California Air Resources Board for use in its cap-and-trade program.⁴⁸ RGGI States may choose to either incorporate the US Forest Protocol by referencing it within state regulations, or choose to adopt the protocols language within state regulations. In addition, forestry projects that have generated credits in a voluntary offset program are allowed to be transferred to RGGI, so long as they meet RGGI requirements and the emission reductions are not double-counted.⁴⁹

The updated Model Rule removed the provisions that expand the number of allowable offsets. In place of these provisions, a **Cost Containment Reserve (CCR)** was introduced.⁵⁰ The CCR consists of a fixed quantity of allowances, above the cap, that are held in a reserve. In 2014, the CCR contained 5 million allowances, and from 2015 onwards it will contain 10 million allowances, replenished at the start of each calendar year. If bids exceed the CCR trigger price at an auction, the CCR allowances are released from the reserve and can be sold to bidders.⁵¹ The CCR price was \$4/ton in 2014, is \$6/ton in 2015, and rises to \$8/ton in 2016, \$10/ton in 2017, and will thereafter rise by 2.5% per year. The CCR trigger price was first reached in the 2014 March auction, releasing an additional 5 million allowances, all of which were purchased.⁵²

Each auction also has a **reserve price**, the price under which no allowance can be sold. Currently, the 2015 auction reserve price is \$2.05 per CO₂ allowance.⁵³ Each year, the minimum reserve price increases by 2.5%.⁵⁴ The MOU allows for unlimited **banking** of covered facilities' allowances and offset allowances for use in future compliance periods, although the amount of banked allowances does factor into future state emissions budgets.⁵⁵

MARKET REGULATION & OVERSIGHT: RGGI's independent market monitor, Potomac Economics, provides monitoring services concerning the competitive performance and efficiency of the RGGI carbon allowance market. These **monitoring services** include:

- identifying attempts to exercise market power, collude, or otherwise manipulate prices in the auction and/or the secondary market,
- making recommendations regarding proposed market rule changes to improve the efficiency of the market for RGGI allowances, and
- assessing whether the auctions are administered in accordance with the noticed auction rules and procedures.⁵⁶

Monitoring and Reporting

On 30 January of a compliance year, covered facilities are required to submit their previous years CO₂ emissions data through the US EPA's Clean Air Markets Division Business System, which then transfers emissions data to the *RGGI CO₂ tracking system* (RGGI COATS).⁵⁷ On 1 March, covered facilities are required to surrender allowances amounting to 50% of their generated emissions in year-one and year-two of the compliance period, and 100% all the remaining emissions at the end of the final year of the compliance period.). After the end of a compliance period (from March to June of the next year), Member States are required to evaluate if the covered facilities has surrendered enough allowances to meet their compliance obligation. On 4 June, once evaluations are completed covered facilities are required to "True-up"

*Enforcement*⁵⁸

Interim compliance obligation: If a covered facility has not complied with its annual obligation, the RGGI Member State in which the facility is located can subject the entity to pay a fine, penalty or impose another remedy according to their assessment.

Final compliance obligation: In the case that a covered facility has not surrendered enough allowances to meet their three-year compliance obligation, the facility will be required to surrender allowances equal to three times the amount of emissions exceeded. In this situation, covered facilities may also be subject to specific penalties imposed by its host RGGI Member State.

COMPLEMENTARY POLICIES: As discussed previously, under RGGI, proceeds from the auctions are returned to the states and invested in consumer benefit programs such as energy efficiency, renewable energy production, climate change abatement, and direct energy bill assistance. Under the MOU, RGGI states are required to use a minimum of 25% of their auction proceeds for a "*consumer benefit or strategic energy purpose*." In practice, RGGI participating states are investing more than 60% of proceeds to improve end-use energy efficiency and accelerate the deployment of renewable energy technologies.

Numerous participating states have also implemented additional state-specific GHG emissions reduction policies not connected to RGGI. For example, each RGGI state has a renewable portfolio standard.

ECONOMIC PROJECTIONS: If member states continue to invest cap-and-trade revenue through to 2020, by some estimates, RGGI stands to benefit from an additional \$3.2 billion in funding, contributing \$8 billion in net value and 57,000 in job years of employment to state economies.⁵⁹

State	Funding (million \$)	Value Add (million \$)	Employment (job years)
Connecticut	225	823	5,702
Delaware	137	385	3,271
Maine	124	420	4,194
Maryland	655	1,655	5,294
Massachusetts	567	1,981	15,083
New Hampshire	129	202	1,798
New York	1,313	1,193	18,520
Rhode Island	57	277	2,274
Vermont	26	88	779
Total	3,236	8,024	56,914

Table 6: Additional Benefits 2013-20

Source: Environmental Northeast, 2013. Economic Benefits of RGGI Available at: acadiacenter.org

ICF International projects RGGI allowance prices between \$3.60 and \$10.20 between 2014 and 2020 under the adjusted cap and flexibility provisions proposed in the updated Model Rule. In ICF's modeling, the CCR will release between 10.0 and 17.6 million short tons (9.1-16 million tCO₂) worth of allowances into the market between 2014 and 2020.⁶⁰

RESULTS: RGGI has achieved emissions well below the cap established in its 2005 MOU. According to the New York State Energy Research and Development Authority (November, 2010), regarding 2005-09 emissions reductions,

*"The analysis concludes that three categories of factors are the primary drivers of the decreased CO₂ emissions over this period: 1) lower electricity load (due to weather; energy efficiency programs and customer-sited generation; and the economy); 2) fuel-switching from petroleum and coal to natural gas (due to relatively low natural gas prices); and 3) changes in available capacity mix (due to increased nuclear capacity availability and uprates; reduced available coal capacity; increased wind capacity; and increased use of hydro capacity)."*⁶¹

The New York State Energy Research and Development Authority (NYSERDA) calculated that emissions in the RGGI region declined 33%, from 184.4 million short tons (167.3 million tCO₂) in 2005 to 123.7 million short tons (112.2 million tCO₂) in 2009.⁶² Between 2008 and 2009, emissions specifically from RGGI electric generation sources decreased by 18.4%.⁶³

Shortly after RGGI began, it became apparent that the program was over-allocated with CO₂ allowances. The history of RGGI auctions reflects this over-allocation. At the first RGGI auction in September 2008, all 12.6 million allowances offered for sale were sold at a single clearing price of \$3.07 per allowance.⁶⁴ In contrast, at the September 2011 auction, only 18% of the 42.19 million allowances offered for sale were purchased, at the low price of \$1.89 per allowance.⁶⁵

On 15 November 2011, the Analysis Group published a study on the economic impacts of RGGI's first compliance period, with a particular focus on the impact auction proceeds had on the states' economies. The authors found that: *"RGGI produced \$1.6 billion in net present value economic value added to the ten-state region. The region's economy—and each state's as well—benefits from RGGI program expenditures. When spread across the region's*

population, these economic impacts amount to nearly \$33 per capita in the region.”⁶⁶

The Analysis Group report categorizes economic impacts of RGGI proceeds into one type of cost and two types of benefits. The author’s findings are described below.

- The net cost to power plant owners was \$1.6 billion between 2008 and 2011. Most of this loss comes in the long-run, as RGGI-driven energy efficiency leads to lower sales of electricity. While in the short run purchasing CO₂ allowances is indeed an expense, power plants are able to recover their allowance expenditures by increasing electricity prices.
- RGGI funds were used to protect customers from electricity price increases and were invested into energy efficiency. Consumers end up gaining from these investments because their overall electricity bills go down as a result of improvements in energy efficiency. In total, electricity consumers enjoy a net gain of nearly \$1.1 billion dollars, as their overall electric bills drop over time.
- The allocation of RGGI proceeds to several types of programs leads to more purchases of goods and services (for example, engineering services for energy audits, energy efficiency equipment, labor for installing solar panels, etc.) that provide an economic stimulus.

Taken together, the **net present value economic benefit** of RGGI’s auction proceeds have exceeded RGGI’s overall cost. Figure 4, below, summarizes the economic impact of RGGI. In addition, RGGI’s first compliance period led to over 16,000 new “job years” and allowed the region to lower dollars sent outside the region in the form of payments for fuel by \$756 million.⁶⁷

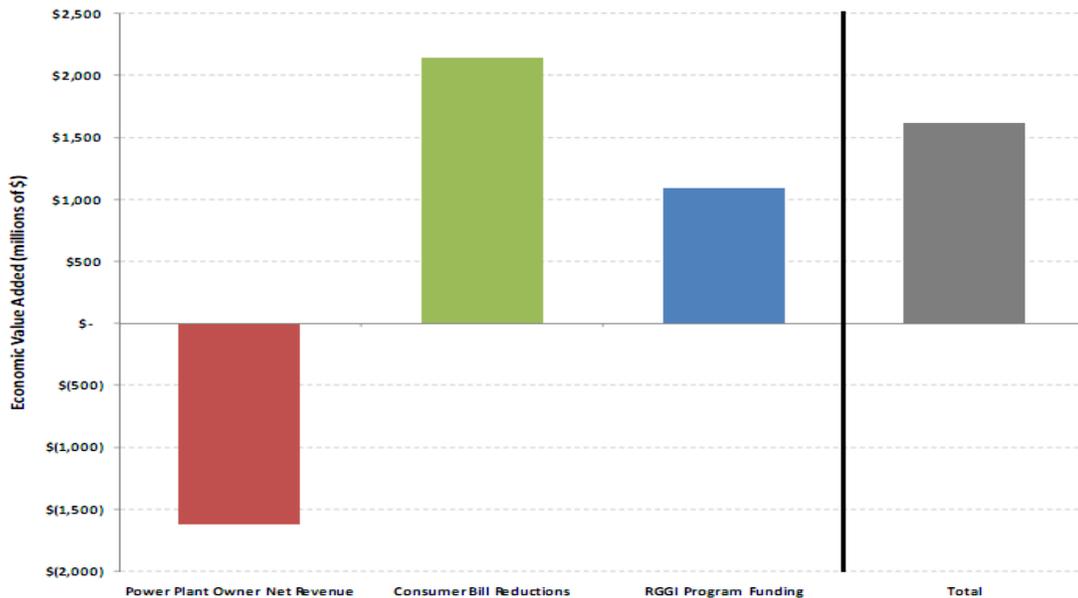


Figure 5: Net Economic Impact to States in the RGGI Region (2011)

Source: Analysis Group Report (2012), Available at: www.analysisgroup.com

Carbon Price Evolution

From analyzing the evolution of the carbon price in the RGGI system, it is possible to see the impact of the Updated Module Rule on the carbon price. With the change in legislation and the subsequent adjustment to the overall RGGI cap that came into effect in 2013, demand for allowances increased accounting for the increase in the carbon price: the auctioning price continued to increase between March 2013 (\$2.80) and March 2015 (\$5.41).

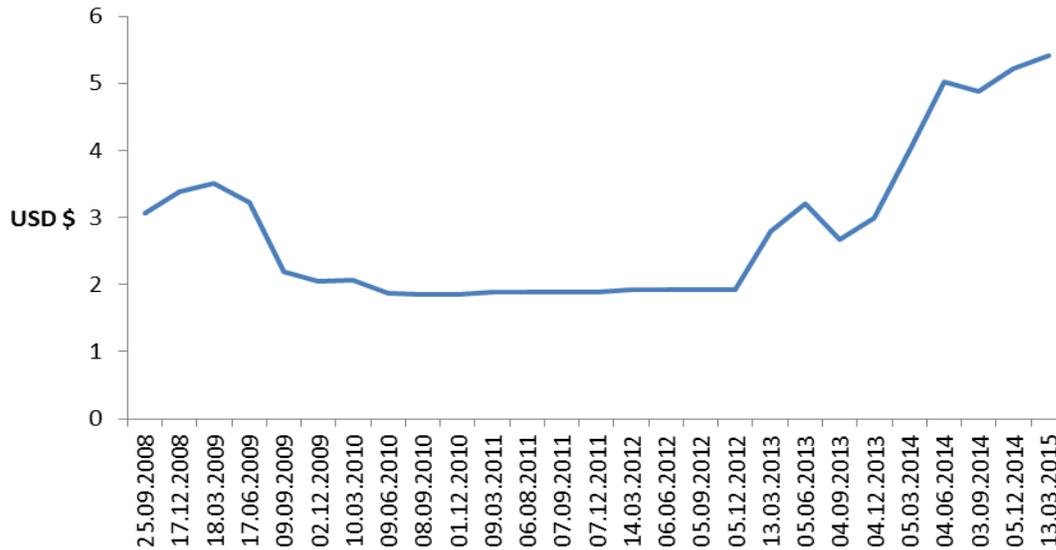


Figure 6: RGGI Carbon Price Development

Source: RGGI, 2015. RGGI Allowances offered and sold. Available at: rggi.org

What Distinguishes this Policy?

UNIQUE ASPECTS:

1. RGGI is one of the only cap-and-trade systems that **mainly uses auctions** to distribute allowances, rather than freely allocating the majority of allowance to covered entities.
2. The RGGI program **only covers emissions in the utility sector**.
3. RGGI is composed of **individual, state-level CO₂ cap-and-trade programs** that allow allowance trading amongst one another.
4. RGGI is also the first ETS in the world to auction the allowances and reinvest the auction proceeds in energy efficiency and renewable energy.

CHALLENGES:

1. Participation in the RGGI program is currently non-binding; therefore, states have the **option to exit the program** (triggering a necessary adjustment to the overall cap). However, at the same time RGGI offers flexibility so that there is also an opportunity for more states to enter the program. In particular, implementation of the US EPA proposed Clean Power Plan (CPP) may lead other states to enter RGGI program under the multi-state plan option.
2. It is currently unknown to what extent states participating in the RGGI system will be in compliance with the CPP mandate, due to the scope and stringency of the existing framework. Beyond this question, another issue is whether the RGGI program is ambitious enough to achieve the CPP target without complementary measures. (For example, RGGI's existing emission cap stops at 2020, whereas the CPP target is set for 2030). These issues may need to be addressed in the upcoming 2016 program review. Additionally, the RGGI system has already experienced over-allocation in the market,⁶⁸ and the new CCR means that the cap could be increased by up to 10 million tons of additional allowances each year (Jonathan L. Ramseur analyses).⁶⁹
3. Thus far **no offset projects** have been developed under RGGI. If in the future, covered entities need to use offset credits, to remain in compliance lack of developed projects could become an issue.⁷⁰
4. As the RGGI cap is lowered, renewed attention may need to be given to the issue of **emissions leakage**, where electricity that would have been produced within the RGGI area is instead imported from states that are not covered by a price. Imported electricity from non-RGGI states is currently not covered under the cap, and over the past five years, imported electricity in RGGI member states has increased (In 2013, imported electricity accounted for 13% of electricity sales in RGGI states⁷¹). Increases in imported electricity – electricity emitted emissions that are not covered by the scheme – could undermine the effectiveness of the program. In March 2008, a RGGI working group released a final report on emission leakage.⁷² Among other things, they recommended that member states monitor for emissions leakage, evaluate the potential extent of projected leakage and evaluate the potential implementation of specific measures to mitigate leakage. In addition, the updated 2012 program review explicitly calls for consideration of emissions leakage and stated the RGGI states commitment to identify and evaluate potential imports tracking tools and pursue additional research leading to a mechanism to address imported electricity emissions.⁷³

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Disclaimer: The authors encourage readers to please contact the EDF and IETA Contacts with any corrections, additions, revisions, or any other comments, including any relevant citations. This will be invaluable in strengthening and updating the case studies and ensuring they are as correct and informative as possible.

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