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# REGIONAL GREENHOUSE GAS INITIATIVE (RGGI): An Emissions Trading Case Study



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# Background

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort among nine Northeastern and Mid-Atlantic states to reduce carbon dioxide (CO<sub>2</sub>) emissions from the electric power sector. RGGI was the first mandatory trading program that caps CO<sub>2</sub> emissions in the US through state-coordinated cap-and-trade programs.<sup>1</sup> Originally designed as a pilot program to show what was possible ahead of the expected implementation of a federal cap-and-trade program, RGGI took on a more permanent focus after the failure of federal cap and trade legislation in 2010.

RGGI completed its first program review with the release of an updated Model Rule<sup>2</sup> on 7 February 2013 along with a Summary of Recommendations to accompany the updated Model Rule.<sup>3</sup> Each of the nine RGGI states adopted the Model Rule amendments; seven through regulatory updates and two (Maine and New Hampshire) with legislation.<sup>4</sup> The updated Model Rule took effect on January 1, 2014, and as part of the 2012 program review, the RGGI states committed to

conduct a second comprehensive program review in 2016.<sup>5</sup> The 2016 program review extended into 2017 and is referred to as the “2017 program review”<sup>6</sup>, the RGGI states finalized the review and released an updated Model Rule on December 19, 2017. The States must now take that model rule through their individual rulemaking processes (Legislative processes in the case of Maine and New Hampshire), for full implementation, beginning in 2020. Another program review is expected in 2021 to evaluate energy trends, performance of the amendments, and other program design elements. The addition of one or more states to RGGI could also need to be addressed.

In recent years RGGI states have been preparing to comply with proposed federal emission targets under the Clean Power Plan (CPP). However, the future of the CPP is uncertain. President Trump’s U.S. Environmental Protection Agency has proposed to repeal the CPP and is considering whether to replace it with an as-yet unknown alternative. These efforts will have to go through required

rulemaking processes and survive judicial review; meanwhile, the CPP remains on the books.

US EPA has announced four public hearings and is seeking input on the CPP replacement by February 26, 2018.<sup>7</sup>



# Summary of Key Policy Features

Third Compliance Period (2015-17) and 2017 Model Rule Changes	
Long-term reduction goal	RGGI states committed to a regional target of more than 50% reduction in CO <sub>2</sub> emissions from the power sector by 2020 relative to 2005 levels
Cap	RGGI 2017 adjusted cap is 62.4 million short tons. (56.6 million tCO <sub>2</sub> ), declining at a rate of 2.5% annual reduction factor through 2020, with a 2020 cap of approximately 78 million short tons. RGGI 2021 adjusted cap is 75.15 million short tons. (68.2 million tCO <sub>2</sub> ), declining at a rate of 2.275% annual reduction factor through 2030. RGGI states have committed to reviewing the cap, and other program elements, every three years.
Compliance Periods	Three-year control period. First control period was 2009-2011. Second control period was 2012-2014. The third period was 2015-2017. The fourth and current control period is January 1, 2018 through December 31, 2020.
Gases Covered	CO <sub>2</sub>
Sectors Covered	Fossil fuel electric generating units
Number of Liable Entities Covered	164 (as of October 2016)
Point of Regulation	Downstream (at the installation level)
Threshold	≥ 25,000 Megawatts
Carbon price	USD \$3.80 (December 2017)
Allowances Allocation	Majority of CO <sub>2</sub> allowances are issued by each RGGI state and distributed through quarterly, regional CO <sub>2</sub> allowance auctions using a "single-round, sealed-bid uniform-price" format. Auctions are open to all parties with financial security, with a maximum bid of 25% of auctioned allowances per quarterly auction
Carbon Leakage Provisions	The RGGI Model rule doesn't contain any specific language addressing leakage
Use of Revenues	State-specific, but major categories of programs include: energy efficiency, renewable energy, greenhouse gas abatement, direct bill assistance
Price/Market Control Measures	Price Control Measure: The RGGI model rule sets a reserve price. The minimum reserve price in calendar year 2017 was \$2.15. In 2018 it is \$2.20. As specified in participating state regulations, the minimum reserve price in calendar year 2014 was \$2.00. Each calendar year thereafter, the minimum reserve price is 1.025 multiplied by the minimum reserve price from the previous calendar year, rounded to the nearest whole cent. The 2017 Model Rule retains this language. Cost Containment Reserve (CCR) at \$10/tonne Market Control Measure: Allowances must retire after the end of each 3-year compliance period* *to secure additional emissions reductions at low prices, the 2016 program review includes an Emissions Containment Reserve (ECR) which would permanently remove up to 10% of a state's portion of the annual cap, if prices fall below the trigger price. ECR prices start at \$6 per ton in 2021 and rise by 7% per year through 2030. Maine and New Hampshire do not intend to implement an ECR
Offsets	Use of offsets is limited to 3.3% of a covered entity's compliance obligation for each control period. RGGI has its own offset protocols and registry for projects based within RGGI jurisdictions, unless an MOU is signed with another state in model rule. Awarded offset allowances remain fungible across the RGGI states.
Linkages	The RGGI program is a linked program among the participating states. Each state has its own independent rules, based off the model rule. The RGGI States have said they are open to considering linkage with new states.
Market Regulation and Oversight	Each state has CO <sub>2</sub> Budget Trading Program based on their own statutory or regulated authority. RGGI also has an independent market monitor, Virginia-based Potomac Economics
Complementary Policies	All complementary policies are state-specific. Examples include: New York's Clean Energy Standard, Rhode Island's new renewable energy laws, Massachusetts's Comprehensive Energy Diversity Legislation, etc.
Enforcement/Penalties	Penalties for non-compliance are set by each state. In the case of excess emissions, compliance allowances for three (3) times the amount of excess emissions have to be surrendered in future periods
Banking	Allowances can be banked for later use. Program includes interim adjustments to the RGGI cap (2014-2020) to account for banked CO <sub>2</sub> allowances. The 2012 program review established two cap adjustments to account for privately held allowances, a third bank adjustment is established in the 2017 revised model rule over a 5-year period (2021-2025) based on the size of the bank at the end of 2020.
Monitoring and Reporting	Emissions data for emitters are recorded in the US EPA's Clean Air Markets Division database, in accordance with state CO <sub>2</sub> Budget Trading Project regulations and US EPA regulations. Provisions are based on the US EPA monitoring provisions.

# Carbon Price Evolution

Analyzing the evolution of the carbon price in the RGGI system, it is possible to see the impact of the updated 2012 Model Rule on the carbon price. With the change in legislation, and the subsequent 45% downward adjustment to the overall RGGI cap that came into effect in 2014, the allowance auction price continued to increase between March 2013 (\$2.80) and December 2015 (\$7.50). A lower revised cap went into effect in 2014, but the market began to adjust as early as December 2012 (from \$1.93) once a new agreement on a cap was announced.

The allowance price of \$7.50 was a product of a complex set of economic, political, and market factors. Prior to the 45% reduction in the cap, emissions in the RGGI region had fallen well below the cap because of

fuel switching (to natural gas), energy efficiency initiatives funded by RGGI and other complementary measures, economic downturn, and a series of warmer-than average winters. The reduction in the cap, combined with the closure of some nuclear plants, improved economic conditions and the release of the Obama administration's Clean Power Plan (CPP) proposal lead to steadily increasing prices.

As seen in Figure 1 below, the June 2016 auction had a clearing price of \$4.53; approximately 40% less than the previous December 2015 record. The reduction in price can, in part, be linked to market reaction to uncertainty around the announcement by the Trump administration to review the CPP in late 2016. In addition, there was continued growth in the unused bank of allowances as emissions

continued to fall and the 2017 program review took more than a year longer than originally expected, leading some traders to speculate if a deal would be reached. On August 23, 2017, RGGI participating states announced the proposed program changes from the 2016 program review: an overall cap reduction of 30% between 2020 and 2030, a higher trigger price and modified size of the cost containment reserve (CCR) mechanism (\$13 in 2021, increasing 7%/year), and the emissions containment reserve (ECR) flexibility mechanism (which Maine and New Hampshire will not implement).<sup>8</sup> In 2018, each state will undergo their own regulatory or legislative process to approve the 2016 program review.



**Figure 1: RGGI Carbon Price Development**

Source: RGGI, 2017. Available at: [rggi.org](http://rggi.org)

# Commentary on Program Performance

RGGI has held emissions well below the cap established in its 2005 MOU. 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 tCO<sub>2</sub>) in 2005 to 123.7 million short tons (112.2 million tCO<sub>2</sub>) in 2009. Between 2008 and 2009, emissions specifically from RGGI electric generation sources decreased by 18.4%.<sup>9</sup> Through 2016, RGGI states have sold over 90% of their emissions allowances through auctions, generating a revenue of over \$2.7 billion to date. Collectively, the total CO<sub>2</sub> emissions from RGGI are 7% of the U.S. CO<sub>2</sub> emissions and represent

16% of U.S. gross domestic product.<sup>10</sup>

Shortly after RGGI began, it became apparent that the program was “long” with CO<sub>2</sub> allowances. The history of RGGI auctions reflects this surplus. 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.<sup>11</sup> In contrast, at the December 2017 auction, 100% of the 14.37 million allowances offered for sale were purchased at the low price of \$2.15 per allowance.<sup>12</sup>

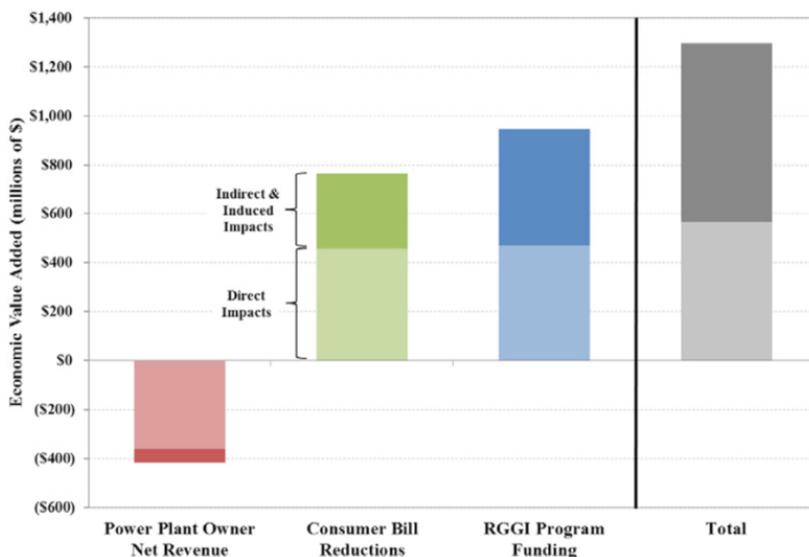
On 14 July 2015, the Analysis Group published a study on the economic impacts of RGGI’s second compliance

period, with a particular focus on the impact auction proceeds had on the states’ economies. The authors found that: taken together, the net present value economic benefit of RGGI’s auction proceeds have exceeded RGGI’s overall cost. Figure 2, below, summarizes the economic impact of RGGI.

In addition, RGGI’s second compliance period led to over 14,200 new “job years” and allowed the region to lower dollars sent outside the region in the form of payments for fuel by \$1.27 billion.<sup>13</sup>

A September 2017 study by the Arcadia Center<sup>14</sup> showed that the RGGI states had achieved emission reductions beyond the cap at the same time as their economies continued to grow. In 2016 RGGI states emitted 79,228,039 tons of CO<sub>2</sub>, falling 8.4% below the RGGI cap, and emissions have fallen 40% since RGGI launched. Average electricity prices across the region have decreased by 6.4% since RGGI took effect, while electricity prices in other states have increased by 6.2%.<sup>15</sup>

An independent study by Abt Associates estimated that RGGI generated \$5.7 billion in health savings and other benefits for Northeastern states as a direct result of healthier families and workers. The study showed 39,000–47,000 lost work days. Indeed, the health benefits from RGGI were shown to extend beyond the RGGI states to include Pennsylvania, Virginia, West Virginia, and the District of Columbia.<sup>16</sup>



**Figure 2: Net Economic Impacts for the Nine State RGGI Region (2015)**

Source: Analysis Group Report, 2015. Available at: [analysisgroup.com](http://analysisgroup.com)

# What Distinguishes this Policy?

## UNIQUE ASPECTS

### 1. Use of Auctions

RGGI is one of the only cap-and-trade systems that **mainly uses auctions** to distribute allowances, rather than freely allocating allowances to covered entities.

### 2. Utility Sector

The RGGI program **only covers emissions in the utility sector**.

### 3. Individual, State-level

RGGI is composed of **individual, state-level CO<sub>2</sub> cap-and-trade programs** that allow trading of allowances amongst one another.

### 4. Auction and Reinvestment

RGGI is the **first emissions trading system in the world** to auction the allowances and reinvest the majority of auction proceeds in energy efficiency and renewable energy initiatives.

### 5. Reserve Price

Since its inception, RGGI has had a built-in **Reserve Price**, enabling RGGI to continue to create economic, environmental and social benefits, even before the cap began adjusting downwards.

## CURRENT CHALLENGES

### Point 1

Participation in the RGGI program is necessarily non-binding. States have the **option to exit the program** (triggering a necessary adjustment to the overall cap). At the same time, RGGI offers flexibility so there exists an opportunity for more states to enter the program. RGGI provides an important model of how to work collectively but allow states to retain autonomy. This RGGI model will prove increasingly important in today's post-Paris, bottom-up climate action world.

### Point 2

The **US states of Virginia and New Jersey** have expressed a desire to join/re-join RGGI. Membership will require the RGGI states to develop a methodology for adjusting the cap and providing an allowance allocation to each new state. RGGI states have also indicated and openness to linkages with other emissions trading programs. However, in order to realize these future program-to-program linkages, many political and policy challenges exist (e.g., how a power sector-only program might link with an economy-wide program).

### Point 3

The RGGI system has pioneered policy solutions that allow participating states to **make cap adjustments** when emissions are significantly below cap levels because of unanticipated economic and technical conditions.<sup>17, 18</sup> The **Emissions Containment Reserve (ECR)** is a first-of-its-kind new design feature that automatically adjusts the cap downwards. Should prices drop below \$6.00 in 2021 (rising 7% per year), participating states will be able to withhold up to 10% of their allocation from the auctions.<sup>19</sup>

### Point 4

RGGI states have largely committed to **continuing with the CPP implementation trajectory** regardless of what and when the US EPA or Congress imposes federal greenhouse gas requirements. Questions still exist as to exactly how far the adjustments in the 2016 program review will take RGGI states toward this goal.<sup>20</sup>

### Point 5

To date, **only one offset project** has been developed under RGGI. In the future, if RGGI covered entities wish to use lower-cost offset credits to remain in compliance, a lack of eligible supply could become a challenge.<sup>21</sup>

# Author

# Acknowledgements

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