

Regional Greenhouse Gas Initiative (RGGI): A Case Study

Discussion Draft: Development of Emissions Trading Around the World

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Brief History and Key Dates:

The Regional Greenhouse Gas Initiative (RGGI) is a cooperative effort **amongst nine Northeastern and Mid-Atlantic States** to reduce carbon dioxide (CO₂) emissions from the electric power sector through a multi-state cap and trade program.¹ Taken together, the RGGI states accounted for 13.1% of U.S. population and 52.3% of U.S. GDP in 2011.² Importantly, RGGI marks the U.S.'s first mandatory trading program that caps CO₂ emissions from power plants.

RGGI developed over several years, starting in late 2003, to address the risks associated with climate change.³ On December 20, 2005, the RGGI states issued a **memorandum of understanding (MOU)** that explained the goal of and justification for RGGI, as well as outlined policy parameters regarding each states program. Additional RGGI states signed the MOU in 2007. Specifically, RGGI's overall environmental goal is to create a CO₂ budget trading (cap and trade) program aimed at stabilizing and reducing emissions within signatory states.⁴ The MOU also emphasizes the importance of the cap and trade program being consistent with continued overall economic growth and the maintenance of a safe and reliable electric power supply system.⁵

RGGI is composed of individual, state-level CO₂ cap and trade programs that allow allowance trading amongst one another. To aid states in establishing similar programs, RGGI regulators created a model rule. Subsequently, and in accordance with this model rule, each state established its own cap and trade program that 1) set limits on in-state CO₂ emissions from electric power plants, 2) issued CO₂ allowances and 3) established state participation in regional CO₂ allowance auctions.⁶

The 2005 MOU mandates a comprehensive 2012 review of the RGGI program. Furthermore, the MOU highlights the following issues that the review must address: the environmental success of RGGI; impact of RGGI on price and system reliability; whether to consider any additional reductions. Lastly, the MOU calls for an evaluation of offsets, including price, availability and environmental integrity.⁷

RGGI started in 2008 when the first auction of CO₂ allowances occurred, while the first control period took effect on January 1 2009.⁸ Currently, RGGI is undergoing its comprehensive program review and is in its second three-year control period (2012-2014).

Summary of Key Policy Features:

CAP/TARGET: RGGI consists of *three-year control, or compliance, periods* (i.e., 2009-2011, 2012-2014 etc.). During the first compliance period, the annual emissions budget was set at 188 million short tons of CO₂. For the second compliance period, the annual emissions budget was adjusted down to 165 million short tons of CO₂ in order to account for New Jersey’s withdrawal from RGGI.⁹ During the third compliance period, the annual emissions budget was set to reduce at 2.5% per year, for a total reduction of **10% by 2018**.¹⁰ In the current regulations it is possible, if allowance prices at auctions reach a trigger price, for a control period to extend from three to four years. However, in draft regulatory amendments this provision would be removed.¹¹

Shares of this overall, regional budget are apportioned to states as outlined in the memorandum of understanding (MOU). For each state, this apportioned share remains constant until 2015, when each share reduces by 2.5% per year for a total reduction of 10 % by 2018. Figure 1 summarizes the *relative portions of the regional budget that each state is allocated in the 2012-2014* compliance period, after New Jersey withdrew.

Policy	Jurisdiction	Details
	CO ₂ Emissions Budget	Share of Regional Emissions Cap
Connecticut	10,695,036	6.47%
Delaware	7,559,787	4.58%
Maine	5,948,902	3.60%
Maryland	37,503,983	22.70%
Massachusetts	26,660,204	16.14%
New Hampshire	8,620,204	5.22%
New York	64,310,805	38.93%
Rhode Island	2,659,239	1.61%
Vermont	1,225,830	0.74%
TOTAL	165,184,246	100%

Figure 1: State CO₂ Emissions Budgets and Share of Regional Cap, 2012-2014. Source: www.rggi.org/design/overview/regulated_sources

Shortly after the end of each three-year compliance period, every covered source must surrender a number of allowances equal to the tons of CO₂ emissions from the source over that three-year compliance period (one ton CO₂ equivalent equals one allowance).¹²

SCOPE/COVERAGE: RGGI covers *CO₂ emissions* from *fossil fuel-fired power plants* located within the RGGI states that are **25 Megawatts (MW) or greater in size**, with the *point of regulation* where electricity is generated by a source. During the first compliance period, which ran between 2009 and 2011, RGGI regulated 211 facilities. After New Jersey withdrew from RGGI, the number of regulated facilities dropped to 171.¹³ Currently, the number of regulated sources is 168.

In 2010, RGGI state emissions in the power sector amounted to 137 million short tons. This amounts to **5.5% of total US emissions from the power sector** (2.26 billion metric tons of CO₂-e).¹⁴

AUCTION OVERVIEW: Approximately 90% of RGGI CO₂ allowances are made available through *central auctions that are conducted quarterly by RGGI, Inc.* on behalf of the RGGI states. The remaining allowances are sold directly by specific states to qualifying affected sources or distributed through set-aside programs.¹⁵ RGGI is

unique in that it is the only cap and trade program that auctions virtually all allowances, instead of freely allocating them.

The format of a RGGI auctions is single-round, sealed-bid, uniform-price, in which each bidder may submit multiple confidential bids for a specific quantity of CO₂ allowances at a specific price.¹⁶ Any entity can participate in the auctions, given they meet qualification requirements—which includes provision of financial security. However, qualified single buyers or group of affiliated buyers may not purchase more than 25% of the allowances offered at a single auction.

Proceeds from the auctions are distributed to states, which then determine how to use the funds.

ALLOWANCE DISTRIBUTION: Each state determines how allowances are allocated—either auctioned or freely allocated—with two restrictions. First, **25% of allowances must be allocated for a consumer benefit or strategic energy purpose**, which includes: 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, **virtually all allowances are auctioned**. Furthermore, in practice, the majority of proceeds from the sale of allowances are allocated toward consumer benefit or strategic energy purposes. Second, states must recognize that, in order to provide regulatory certainty, **state-specific rules for allocations** should be completed as far in advance of the launch of the program as practicable.¹⁷

During the first compliance period, between 2009 and 2011, the **proceeds from auctioned allowances** and direct sales equaled roughly \$912 million.¹⁸ In addition, states have received, programmed and disbursed virtually all of these proceeds back into the economy in myriad ways including: energy efficiency measures, community-based renewable power projects, 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.¹⁹ Figure 2 provides a summary of how states spent these proceeds.

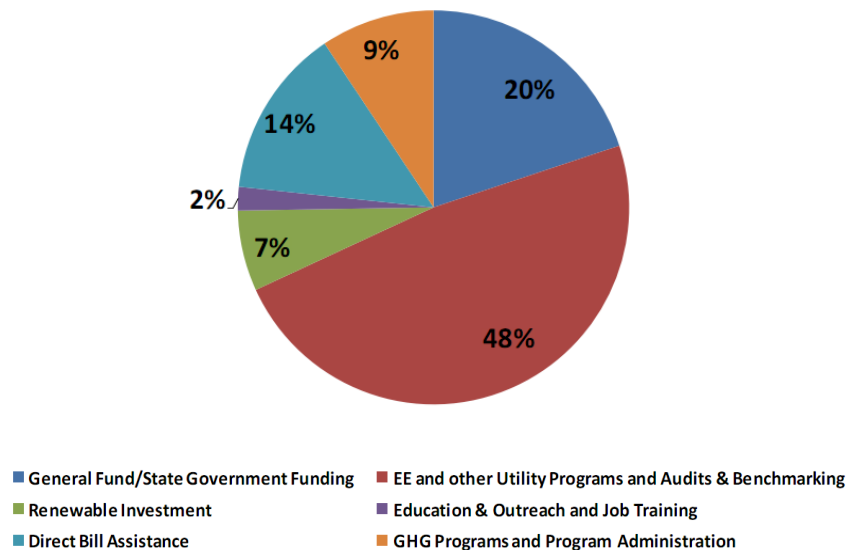


Figure 2: RGGI Proceed Spending from All RGGI States. Source: Analysis Group (2012)²⁰

FLEXIBILITY PROVISIONS: RGGI contains several flexibility provisions including the use of offsets and early reduction credits, banking, compliance periods with flexible durations, and price collars (an auction reserve price and a unique, complex "safety valve" mechanism).

RGGI has put in place *its own offset protocol and registry* for projects based within RGGI jurisdictions. The RGGI program currently allows offsets from the following project types: capture or destruction of CH₄ from landfills; SF₆ reductions from electricity transmission and distribution equipment; CO₂ sequestration through afforestation; CO₂ reductions through non-electric end-use energy efficiency in buildings; and avoided CH₄ emissions through agricultural manure management operations.²¹ In addition to these requirements, additional qualifications include:

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

The **use of offsets is limited to 3.3% of a covered entity's reported emissions**. RGGI contains geographical considerations as well; for offsets that originate outside of the RGGI region, the project state must be entered into an MOU with the RGGI states.

Each signatory state could grant **early reduction credits to facilities covered by RGGI** for reductions in the CO₂ budget source's CO₂ emissions (inclusive of all emissions from CO₂ budget units at the CO₂ budget source) that are achieved by the source during the early reduction period (2006, 2007, and 2008), subject to:

- The CO₂ budget source must submit an application of ERAs by May 1, 2009 in order to receive early reduction allowances (ERA).
- The CO₂ budget source must demonstrate that all CO₂ budget units that existed at the source during the baseline period (2003, 2004, and 2005) are included as CO₂ budget units for the early reduction period. New CO₂ budget units added at the CO₂ budget source must also be accounted for during the early reduction period.
- The **Regulatory Agency** will calculate the number of ERAs to be awarded to a particular CO₂ budget source for the early reduction period pursuant to the methodology in the Model Rule.²²

There is **unlimited banking** of covered facilities' allowances, offset allowances, and early reduction credits for use in future periods.²³

Each auction has a reserve price at which no allowance will be sold under. Currently, **the auction reserve price is \$1.93 per CO₂ allowance**.

The decision to use **three-year compliance periods**, compared to requiring compliance annually, offers covered entities flexibility. In addition, RGGI has a complex "trigger price" mechanism. As part of this mechanism, extension of a compliance period is allowed under certain circumstances. Specifically, after the first 14 months of each compliance period, the duration of a compliance period can be extended by up to three one-year periods if the average price of an allowance exceeds the trigger price for a period of twelve months on a rolling average. The trigger price is \$10 (in 2005\$) as adjusted by the Consumer Price Index (CPI) plus 2% per year beginning on January 1, 2006.²⁴

In addition to allowing offsets and extensions of compliance periods, RGGI contains provisions to change offsets usage limits. If average allowance prices increase over the first 14 months to above USD 7 or USD 10, allowance usage increases to 5% and 10%, respectively. In addition, at the USD 10 price trigger RGGI can accept international offset units, such as Certified Emissions Reductions (CERs).

MARKET REGULATION AND OVERSIGHT: RGGI's *independent market monitor*, Potomac Economics, provides monitoring services concerning the competitive performance and efficiency of the RGGI carbon allowance market. Such 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;
- Assessing whether the auctions are administered in accordance with the noticed auction rules and procedures.²⁵

Emitters are required to *report quarterly CO₂ emissions* to RGGI states through the United States Environmental Protection Agency's (EPA's) Clean Air Markets Division Business System in accordance with the state CO₂ Budget Trading Program requirements and U.S. EPA regulations at 40 CFR Part 75.²⁶

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 2005 RGGI Memorandum of Understanding, the RGGI participating states are required to invest a minimum of 25 percent of their auction proceeds for a "consumer benefit or strategic energy purpose." In practice, RGGI participating states are investing on more than 60 percent of proceeds to improve end-use energy efficiency and accelerate the deployment of renewable energy technologies.²⁷ *Beyond the funding provided by the auction, there are no other regional complementary policies to the cap-and-trade program*. However, numerous participating states have implemented additional state-specific GHG emissions reduction policies.

ECONOMIC PROJECTIONS: Based on future projections, if the cap remains unchanged from the initial design, the *allowance price is not expected to rise above the price floor through 2018*. Since the price of allowances is not expected to exceed the floor price, the use of offsets and trading on the secondary market has not materialized at this point. As part of the 2012 program review, on behalf of the RGGI states, RGGI Inc. held a stakeholder meeting in March of 2012 to receive input and present findings on IPM electricity sector modeling conducted by ICF International. The RGGI states are evaluating potential program changes throughout 2012.

RESULTS: RGGI has achieved its original targets for emissions budgets, but this is very likely largely related to the sharp reduction in macroeconomic output, especially considering that emissions drastically reduced before RGGI began. The New York State Energy Research and Development Authority (NYSERDA) calculates that emissions in the RGGI region *declined 33 percent*, from 184.4 million short tons in 2005 to 123.7 million short tons in 2009.²⁸

Between 2008 and 2009, emissions from RGGI electric generation sources decreased by 18.4%,²⁹ at least in part due to the recession. 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. For example, in September 2008, at the first RGGI auction, all 12.56 million allowances offered for sale were sold at a single clearing price \$3.07 per allowance.³⁰ In contrast, at the September 2011 auction, 18 percent of the 42.19 million allowances offered for sale were purchased at \$1.89 per allowance.³¹

On November 15 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."³²

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 and summarized by Figure 3.

- The **net cost to power plant owners** was USD 1.6 billion between 2008 and 2011 or a net loss of net revenue. 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 an expense, power plants are able recover their allowance expenditures through increased electricity prices.
- RGGI funds were used to protect customers from electricity price increases and were invested into **energy efficiency**. From these two uses of funds, electricity prices increase in the short run but, over time, consumers gain because their overall electricity bills go down as a result of these energy efficiency investments. Overall, 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.).

Taken together, the **net present value economic benefit** of RGGI's auction proceeds exceeded the cost of RGGI's carbon price. In addition, RGGI's first compliance period led to over 16,000 new "job years" and allowed the ten-state region to lower dollars sent outside the region in the form of payments for fuel by \$756 million dollars.³³

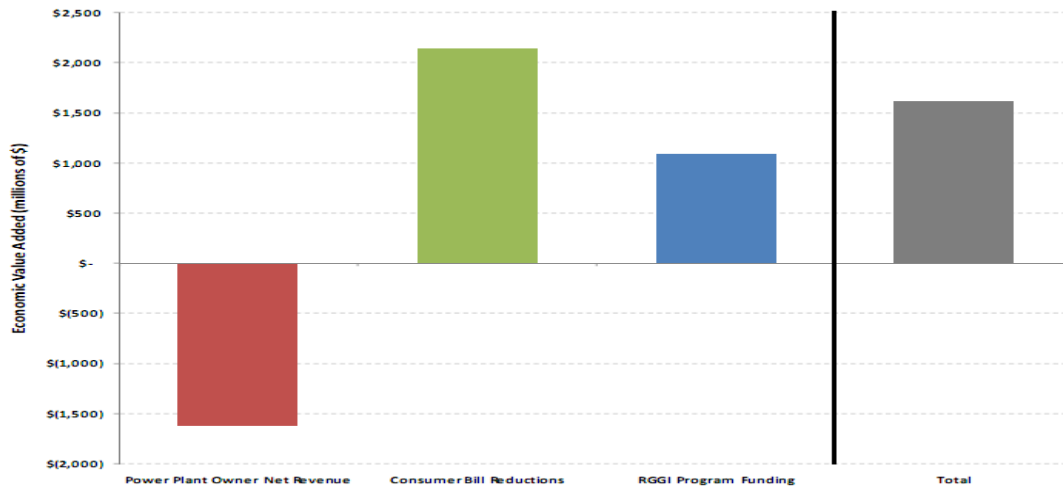


Figure 3: Net Economic Impact to States in the RGGI Region (2011 USD). Source: Analysis Group Report (2012)³⁴

What Distinguishes this Policy?

UNIQUE ASPECTS:

1. RGGI is one of the only cap and trade systems that **auctions**, instead of freely allocating, the majority of allowances to covered entities.
2. The RGGI program only impacts emissions in the **utility sector**, rather than a multi-sector cap.
3. RGGI is composed of **individual, state-level CO₂ cap and trade programs that allow allowance trading amongst one another.**

CHALLENGES:

1. Participation in the **RGGI program is non-binding**; so, states have the option to exit the program, and the cap is then adjusted to reflect their exit. However, there is also the option for more states to enter the program in the future as well.
2. As discussed earlier, an over-allocation has resulted because the **business-as-usual emissions for covered facilities are below the cap**. This is due to both to the macroeconomic slump that has decreased output and RGGI's success at reducing emissions (both through pricing carbon and investing auction proceeds into energy efficiency and renewable energy).
3. **Moving forward, RGGI officials will have to contemplate if and how to lower the cap**. There have already been moves by states to retire or withhold allowances unsold in the first compliance period, which will lower allowance supplies and increase potential demand. If the RGGI cap is lowered, renewed attention may need to be given to the issue of emissions leakage. As with any regional approach, the potential for economic and emissions leakage is particularly important.

Author Acknowledgements:

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Disclaimer: This Discussion Draft is intended as a reference of factual information regarding this program and is envisioned as a work in progress as policies continue to evolve and new information becomes available. The authors encourage readers to please contact them 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.

¹ These states include Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New York, Rhode Island and Vermont. New Jersey participated in the first RGGI control period, but on May 26 2011, New Jersey withdrew from the program. Baxter, Christopher, "Gov. Christie Announces N.J. Pulling Out of Regional Environmental Initiative," May 26, 2011.

Population and GDP statistics; US Census Bureau (estimate, 2011); Bureau of Economic Analysis (2011); IETA Calculations

² Hibbard, Paul J., Susan F. Tierney, Andrea M. Okie, and Pavel G. Darling. *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States*. Publication. Analysis Group, 15 Nov. 2011. Web. 22 May 2012.

http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf

³ *Supra*, Note 2.

⁴ *Regional Greenhouse Gas Initiative: Memorandum of Understanding*. Tech. 20 May 2005. Web. <http://rggi.org/docs/mou_12_20_05.pdf>.

⁵ *Supra*, Note 4.

⁶ RGGI, Inc. (2012). "Program Design." Available at www.rggi.org/design

⁷ *Supra*, Note 4.

⁸ *Supra*, Note 2.

⁹ *Supra*, Note 1.

¹⁰ RGGI, Inc. (2012). "The RGGI CO₂ Cap." Available at www.rggi.org/design/overview/cap

¹¹ RGGI, Inc. "Summary of Preliminary Draft Model Rule Changes." Available at

http://www.rggi.org/docs/ProgramReview/November20/12_11_20_Model%20Rule%20Summary.pdf

¹² *Supra*, Note 2.

¹³ RGGI, Inc. (2012). "Regulated Sources." Available at http://www.rggi.org/design/overview/regulated_sources

¹⁴ (1) US Environmental Protection Agency. "Executive Summary." Available at <http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2012-ES.pdf>; and (2) Environment Northeast (May 2011). "RGGI Emissions Trends." Available at http://www.env-ne.org/public/resources/pdf/ENE_RGGI_Emissions_Report_110502_FINAL.pdf

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- ¹⁶ RGGI, Inc. (2012). “Fact Sheet: RGGI CO₂ Allowance Auctions.” Available at http://www.rggi.org/docs/RGGI_Auctions_in_Brief.pdf
- ¹⁷ *Supra*, Note 4. See page 6, section 2. G.
- ¹⁸ *Supra*, Note 2.
- ¹⁹ *Supra*, Note 2.
- ²⁰ Analysis Group (2012), “The Economic Impact of the Regional Greenhouse Gas Initiative on Ten Northeastern and Mid-Atlantic States”
- ²¹ *Supra*, Note 4. Page 4, part 2. F. (1).
- ²² Model Rule, Section XX-5.3(c)
- ²³ *Supra*, Note 4. Page 6, pat 2. I.
- ²⁴ *Supra*, Note 4. Page 3, Section 2. E. (2)
- ²⁵ RGGI, Inc. (2012). « Market Monitor Reports. » Available at http://www.rggi.org/market/market_monitor
- ²⁶ RGGI, Inc. (2012). « Fact Sheet : CO₂ Budget Source (RGGI) Compliance. » Available at http://www.rggi.org/docs/RGGI_Compliance_2012_Fact_Sheet.pdf
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- ²⁹ *Supra*, Note 2.
- ³⁰ *Supra*, Note 2.
- ³¹ *Supra*, Note 2.
- ³² *Supra*, Note 2.
- ³³ *Supra*, Note 2.
- ³⁴ *Supra*, Note 18