



THE REGULATORY ASSISTANCE PROJECT

The Regional Greenhouse Gas Initiative in the Northeastern United States: Auctioning Emissions Allowances

December 2008

Introduction and Overview

The Regional Greenhouse Gas Initiative (RGGI) is the cooperative endeavor of ten Northeastern U.S. states¹ that will reduce greenhouse gas emissions from the electric power sector by 10% by December 31, 2018, relative to a baseline of emissions in the period of 2000 to 2004. One key principle adopted by the RGGI states is that GHG allowances should *not* be distributed to emitters for free, as was previously done in the Acid Rain (SO₂) and NO_x Budget programs, and the first phase of the European Union Emission Trading Scheme (ETS). Instead, the RGGI states agreed to auction most of the allowances, thereby generating revenue for the states to invest energy efficiency and other carbon reducing options. The states independently decided to auction between 60-100% of their allowances, and use an average of 74% of the revenue generated from the auction sales for energy efficiency and clean energy activities. The first auction, which occurred on September 29, 2008, involved six of the ten states and generated \$38.5 million dollars. Future auctions will be quarterly and, with the full participation of all ten states, are estimated to generate as much as a billion dollars per year. Because most of this revenue will be recycled into energy efficiency and clean energy, state investments in these program areas are expected to double. The majority of the CO₂ emission reductions from RGGI are expected to occur through these investments, rather than directly through the cap on emissions from the power sector or the effect of internalizing the cost of carbon in electricity prices.

This article will firstly describe the background principles of the RGGI program, and secondly it will explain the auction process by which emissions allowances are allocated.

Background

Before discussing the specifics of the RGGI programs and its auctioning of allowances, several issues need to be understood to appreciate the context for how the RGGI program was developed.

- The intent of RGGI was to move the United States as quickly as possible to a national system where greenhouse gas emissions are capped.

¹These ten states, which constitute approximately 20% of the U.S. GDP, are Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

- The RGGI states established a reduction goal consistent with UN IPCC Third Assessment, which recommends an 80% reduction in current emissions by 2050, equivalent to an annual reduction of 2-3%.
- The framers of RGGI wanted a mandatory, not voluntary, program to cap GHG emissions, knowing that differences between constrained RGGI region and adjacent unconstrained areas could dilute the overall purity of anticipated emissions reductions.
- The RGGI region is almost entirely comprised of states that have restructured their electricity markets.
- Capping and reducing GHG emissions is very different from capping and reducing NO_x and SO_x emissions. GHG emissions reductions will largely be achieved by measures that occur away from the smokestack, through energy demand reduction measures.
- Politics matter.

The original intent of RGGI was to drive similar policy action at the Federal level. The RGGI development process began in 2005 when New York Governor Pataki sent a letter to ten other Northeastern and Middle Atlantic states, inviting them to join his state in addressing climate change. In this letter, Governor Pataki made it clear that he was taking a bold step, one different to and opposed to that of President Bush, who was of the same political party. Governor Pataki recognized, along with the other governors who agreed to join him, the need to move the United States along a path that would lead to a national GHG cap.

The RGGI states set a reduction goal before developing other program implementation rules. The research of a bipartisan group, the National Commission on Energy Policy, informed the decision. NCEP's approach was to take a measured stance: first slow, then stop, and finally reverse GHG emissions. The RGGI states agreed to first cap emissions at current levels for six years (which is itself a reduction from business-as-usual given annual electric consumption growth of 1-1.5%), then to reduce emissions 2.5% each year for four years. The 2.5% per year reduction trajectory, though far from adequate, is consistent with approaches recommended by the United Nations Intergovernmental Panel on Climate Change (IPCC), World Resources Institute (WRI) and the U.S. Climate Action Partnership.

The first step for RGGI developers was to leverage the states' experience with caps on NO_x and SO_x for the utility sector to develop a similar cap on GHG emissions. Voluntary programs, such as the private sector Chicago Climate Exchange (CCX) and the U.S. Department of Energy's Voluntary Reporting of Greenhouse Gases program² had proven useful for testing new systems and important principles such as carbon price discovery. However, despite the fact that RGGI achievements would be diluted by the adjacent, unconstrained regions, the RGGI states pursued a mandatory program from the outset. The states agreed to a mandatory program due in large part to their experience and comfort with the design and implementation of the Acid Rain and NO_x Budget programs.

² This program is referred to as section 1605(b) of the National Energy Policy Act of 1992.

The core principles of these previous two emissions trading programs were incorporated into the design of RGGI. They include the principles that emissions reductions must be: *real, surplus, verifiable, permanent and enforceable*.³ These concepts led to RGGI's requirements for financial and regulatory "additionality". The principle of additionality denotes that if an emissions reduction is already required by preexisting state regulations or is expected to be achieved due to state funding, then those reductions cannot count against the reductions required by RGGI. Examples of preexisting measures are state renewable portfolio standards (RPS) and system benefit charge funds for energy efficiency and renewable energy investments. Since the level of the RPS is already fixed by state statute, and the level of energy efficiency investment through a system benefit charge is also known, those investments cannot count as reductions under a regional GHG program. All reductions associated with RGGI, therefore, must be additional.

While many of the RGGI design principles were imported from the states' experience with Acid Rain and NO_x Budget, there are two important points that distinguish RGGI from these earlier programs.

1. The two previous market-based initiatives occurred when the utility industry was a regulated, vertically-integrated monopoly. RGGI's design anticipates implementation in a restructured electricity market, based on hourly clearing prices that are set by the marginal generating unit.
2. The NO_x Budget and Acid Rain programs allocated their allowances administratively so that generators could sell them and use the revenue to pay for the installation of emissions control equipment and related plant improvements. The bulk of RGGI's required GHG reductions will occur away from the smokestack.

In the RGGI region, the electricity markets are dominated by a mix of natural gas, oil, coal and nuclear generation. In the New England market, natural gas units most frequently establish the hourly clearing price, while in New Jersey, Delaware and Maryland, a mix of coal and natural gas units set the marginal clearing price. All units that operate in a particular hour are paid the same price, thereby putting cleaner, more expensive gas units at a comparative disadvantage to cheaper, dirtier coal units. Under the NO_x Budget and Acid Rain programs, emissions allowances were allocated administratively and free of cost. In a restructured industry, however, this method results in a greater windfall profit to generators.

One study prepared for RGGI estimated that total generator windfalls from 100% free allocation based on historic emissions could total \$1 billion or more annually.⁴ More generally, the U.S.

³ *Real* means that the tons actually exist, that there is affirmative effort undertaken. *Surplus* means that the tons being considered are not required for compliance with any other program. *Verifiable* means that the tons can be accounted for using standard, recognized and replicable protocols. *Permanent* is self-evident. In the context of GHG reductions, the concept of permanence is often tied to the life of a specific project or contract, but in no cases is less than ten years, and more often is 20, 30 or more years. *Enforceable* means that some recognized authority has oversight or responsibility and can either take corrective action to assure the reductions occur and/or can assess penalties for failure to do so.

⁴ Dallas Burtraw et al., *Allocation of CO₂ Emissions Allowances in the Regional Greenhouse Gas Cap-and-Trade Program*, 52 Table 19 (2005), available at <http://www.rff.org/documents/RFF-DP-05-55.pdf>.

Congressional Budget Office found that for the nation as a whole, “[p]roducers would have to receive only a modest portion of the allowances to offset their costs from a cap on carbon emissions.”⁵ European governments that initially allocated allowances to generators on a free, historic basis during Phase I of the EU Emissions Trading Scheme are now using an auction approach. These experiences led to the decision by the RGGI states to auction allowances, the details of which will be provided in later sections.

The decision to auction allowances was associated with an equally important principle that the revenue from RGGI allowance auctions should be directed back to the state programs and invested in measures that reduce GHG emissions. Reducing GHG emissions is very different from reducing NO_x and SO_x emissions. GHG emissions reductions will largely be achieved by measures that occur away from the smokestack, through energy demand reduction measures. Extensive modeling completed for RGGI determined that a doubling or trebling of existing state energy efficiency and renewable energy investment funds would be needed in order to predictably achieve the anticipated level of emissions reductions. Estimates of the amount of revenue that could be raised through the auctioning of RGGI allowances reflected that about 10-30% more revenue could be provided to the state efficiency and renewable programs.

A final point on the context of RGGI is that, like all government programs, politics matter. The process by which the RGGI baseline was set, apportionment of allowances to states, the amount of allowances to be auctioned, what projects might qualify for offsets, all these were subject to lengthy and intense negotiation. The program would have been strengthened with a Federal driver and oversight, as was the case for the earlier NO_x Budget and Acid Rain programs. Certainly, if RGGI had been designed in 2008, instead of 2004, it would have looked different.

Imperfect though it may be, the program significantly contributed to putting pressure on the Congress and the Federal government over the last three years. Without RGGI, the Lieberman-Warner bill would not have included provisions to auction allowances nor would it have provisions that require states to operate energy efficiency programs. RGGI also enabled other regions to initiate their own regional programs, the Western Climate Initiative and the Midwestern Governors’ Initiative both grew from and built upon the initial and critical first step taken by RGGI: to require mandatory reductions of GHG emissions.

RGGI Allowance Auctions

The RGGI states agreed, in a memorandum of understanding (MOU) dated December 20, 2005, that at least 25% of the RGGI allowances would be auctioned. Subsequently, several states enacted legislation that requires 100% of the RGGI allowances to be auctioned. Several states also

Congressional Budget Office, Issues in the Design of a Cap-and-Trade Program for Carbon Emission, 4 (2003) available at <http://www.cbo.gov/doc.cfm?index=4861&type=0>. Others have found that generators would require as little as 11% of allowances to recover their compliance costs in a cap-and-trade program: Dallas Burtraw and Karen Palmer, Resources for the Future, *Compensation Rules for Climate Policy in the Electric Sector*, 41 (2007), available at <http://www.rff.org/rff/Documents/RFF-DP-07-41.pdf>.

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enacted legislation requiring that the auction revenues be invested for the consumers' benefit in primarily energy efficiency and renewable energy.⁶

The logic for auctioning allowances, rather than distributing them administratively and without charge, is that electric generating units currently have no direct means to reduce their GHG emissions – that is, there are no smokestack control technologies today that can remove GHGs from the combustion exhaust stream. In contrast, under the Acid Rain and NO_x Budget programs, allowances were distributed at no cost to generators. Generators then either retired the allowances as needed or sold them and used the proceeds to invest in control equipment that directly reduced sulfur oxides and oxides of nitrogen emissions at the smokestack. For CO₂, the most cost-effective means to reduce emissions today is indirectly, through investments in energy efficiency and renewable energy. Proceeds from the RGGI auctions are therefore to be directed to reducing energy consumption, and to constructing renewable generation that will reduce the output of the fossil fueled power plants, and encourage operation of cleaner, less carbon-intensive generation.

A consultant was hired to advise the RGGI states on auction design, market monitoring, and other principles important to conducting transparent and credible auctions. Acting on behalf of RGGI, the New York State Energy Development Authority (NYSERDA) hired representatives from the University of Virginia (UVA) and Resources for the Future (RFF) to develop recommendations to RGGI for how the states should design, develop and implement, a GHG allowances auction.

The UVA/RFF report includes 16 recommendations on ways to establish price discovery, ensure transparency, and to avoid market manipulation.⁷ The report recommends that RGGI conduct a *uniform price, sealed bid, single round* auction. This type of auction calls for bids to be “stacked” in the descending order of their prices, i.e., from the highest to the lowest. At the same time, the number of allowances to which the bids relate accumulates (see Table 1, below). When the number of bids equals the amount of allowances that is offered for sale, then the market clears and the price of the last (or “marginal”) bid becomes the market clearing price. All allowances will be sold at that single clearing price. In this way, everyone who bid the clearing price or greater will receive allowances. The nature of a single round, uniform price auction means that bids that were received that were less than the clearing price do not receive allowances. Those low bidders are eligible to submit bids in subsequent auctions. This type of auction does encourage bidders to submit multiple bids at varying prices in order to successfully receive some allowances at whatever the ultimate clearing price.

⁶ Connecticut, Maine, Maryland, Massachusetts, New Jersey, Rhode Island, and Vermont have enacted such legislation. The other states have expressed similar intentions to auction all or virtually all of their allowances and to use the revenues for energy efficiency, other clean energy investments, and for consumer benefits generally.

⁷ These 16 recommendations can be found in brief in the report's Executive Summary and at length in Part Three. “Auction Design for Selling CO₂ Emission Allowances Under the Regional Greenhouse Gas Initiative,” Resources for the Future, California Institute of Technology and University of Virginia, October 2007, available for download (as of December 2, 2008) at http://www.rff.org/rff/News/Features/upload/31135_1.pdf.

Table 1. Example of a Single-Price Auction

Bidder (in chronological order)	Bid Price	Number of Allowances bid	Cumulative Bids
E	\$5.00	20,000	20,000
A	\$4.50	10,000	30,000
B	\$4.10	10,000	40,000
D	\$4.05	20,000	60,000
E	\$4.00	10,000	70,000
A	\$3.95	10,000	80,000
C	\$3.85	10,000	90,000
E	\$3.80	10,000	100,000
D	\$3.75	5,000	125,000

Source: Regional Greenhouse Gas Initiative, Auction Bidder Webinar, July 24, 2008.

In the Table 1 example, there were 100,000 allowances offered. The auction cleared at \$3.75, the tiered price at which the number of allowances bid exceeded those offered for sale.

The UVA/RFF report also recommends several actions for market monitoring and credibility, which have also been adopted by the RGGI states. The number of allowances for each auction is limited, and auctions will be held quarterly. RGGI has a three-year compliance period, with the first period beginning January 1, 2009, and ending December 31, 2011. For each compliance period, there will be twelve auctions – four per year. To help establish the market, and to get experience prior to the program’s effective date, six states⁸ desired to sell allowances before January 1, 2009. There will two such preliminary auctions, in which only a fraction of the six states’ 2009 allowances will be sold. All ten RGGI states agreed to establish a reserve price of \$1.86 per allowance. No allowance will be sold for less than the reserve price and, if a sufficient number of bids is not received, any remaining allowances will be bundled and offered for sale in subsequent auctions.

Among the other operating principles that the RGGI states have adopted is that no one person or entity may purchase more than 25% of the allowances during any one auction. Bidders must disclose beneficial ownership to establish that this limit has been exceeded.⁹ They must also post letters of credit and to demonstrate that they hold sufficient funds to cover the amount of their bids. Bidders must also establish an account in the Carbon Dioxide Allowance Tracking System (COATS).

The RGGI states reserve the right to change the auction rules if they observe inappropriate or manipulative behavior. Since all allowances will be tracked through COATS, the RGGI states will be able to determine the nature and extent of any secondary market that develops, and whether additional actions to address speculation should be taken. The RGGI states can change the type of

⁸ Connecticut, Maine, Maryland, Massachusetts, Rhode Island, and Vermont.

⁹ “Beneficial ownership” means that auction participants must disclose on whose they are purchasing allowances.

auction conducted if the uniform price, sealed bid, single round format does not meet expectations or if it is necessary to improve the auctions' credibility and transparency.

Allowances will also be sold on a forward basis. Beginning in 2009, bidders will be able to buy some allowances for 2012, 2013, and 2014. Banking, which means that unused allowances can be carried forward to the next three-year compliance period, is permitted. However, the opposite is *not* permitted, that is, allowances designated for 2012 cannot be used in 2009. The RGGI states have also limited forward sales. This means that prior to the start of a vintage year, states will not have made available for purchase any more than 50% of that vintage year's allowances. In other words, by way of example, no more than 50% of 2010's allowances will be auctioned before January 1, 2010.

RGGI states have not adopted a second MOU to cover the auction and its processes. Each state has set its own regulations for governing its participation in the auction. Massachusetts and Connecticut, for instance, have passed legislation and conducted rule-makings; in contrast, Vermont's participation is determined by a previously-approved administrative process. As Table 2 below shows, six out of the ten participating states, Maine, Massachusetts, New Jersey, New York, Rhode Island, and Vermont, have determined to auction more than 90% of allowances at the program outset. Across all RGGI states, a weighted average of 91% of allowances will be auctioned. Column H of Table 2 denotes the amount of auction revenue that each state will dedicate to energy efficiency efforts. It shows a range for 2009 from 39% in Delaware and Maryland, to 99% in Vermont. A weighted average of 74% of RGGI auction revenue will be directed to energy efficiency activities, with that portion set to increase over time.

Table 2. RGGI State Policy Status

(A) State	(B) Population (2007, million) ^e	(C) State Gross Domestic Product (2007, billion) ^e	(D) Electricity Consumption (2006, TWh) ^h	(E) Annual Allocation (short tons)	(F) Percentage of Allowances to be Auctioned	(G) Percentage of Auction Proceeds Earmarked for Energy Efficiency	(H) Net RGGI Funding Earmarked for Energy Efficiency ^u
Connecticut	3.5	216.3	31.667	10,695,036	77%	69.5%	53.5% up to \$5 ^λ
Delaware	0.9	60.1	11.555	7,559,787	60% (increasing to 100% by 2014)	Up to 65% [*]	39% in 2009, increasing to 65% in 2014 [*]
Maine	1.3	48.1	12.285	5,984,902	100%	Up to 88% ^α	Up to 88% up to \$5 ^λ
Maryland	5.6	268.7	63.173	37,503,983	85%	46%	39%
Massachusetts	6.4	351.5	55.850	26,660,204	98%	Not less than 80%	Not less than 78.4%
New Hampshire	1.3	57.3	11.094	8,620,460	At least 71% through 2011, at least 83% thereafter	Up to 90%	Up to 63% through 2011, up to 75% thereafter ^w
New Jersey	8.7	465.5	79.681	22,892,730	Up to 99% (with \$2 allowances set aside for CHP and direct allocation to Co-generation) ^δ	Up to 80%	Up to 79%
New York	19.3	1,103.0	142.238	64,310,805	97%	Up to 100% [*]	Up to 97% [*]
Rhode Island	1.1	46.9	7.799	2,659,239	99%	Up to 95% ^p	Up to 94% ^p
Vermont	0.6	24.5	5.795	1,225,830	99%	100% ^g	99% ^g
RGGI Total	48.7	2641.9	421.137	188,112,976			
RGGI Weighted Average^t					91%	80%	74%

^e Source: EIA <http://tonto.eia.doe.gov/state/index.cfm>
^h Source: EIA Electric Sales, Revenue and Average Price 2006; Table 2: Retail Electricity Sales 2006 http://www.eia.doe.gov/cneaf/electricity/esr/esr_sum.html
^u The product of column (F), the percentage of allowances to be auctioned, and column (G), the percentage of auction proceeds earmarked for energy efficiency.
^λ Revenue raised from allowance prices exceeding \$5 must be returned to ratepayers as rebates.
^{*} Means that energy efficiency is one option on a list that includes renewable energy and other clean energy investments and details on distributions of the proceeds are yet to be worked out.
^α In Maine 10% portion of allowances will go to incentives for combined heat and power (CHP) facilities at integrated manufacturing facilities and 2% portion of allowances will go to VRECs.
^p Rhode Island's RGGI auction proceeds have been put into a restricted receipt account, which is subject to a potential 10% reduction for use in the general fund.
^g In Vermont net proceeds, after administrative costs associated with Vermont's participation in RGGI and any awards to state agencies for innovative carbon abatement technologies are deducted, are earmarked for energy efficiency.
^δ NJSA 26:TC-52 mandates a two-part rulemaking; first, the DEP will promulgate Priority Ranking Guidance, and second, DEP, BPU, and EDA will conduct funding rulemakings.
^w Early reduction allowance not to exceed 2.5 million tons in 2009-2011 and 1.5 million tons thereafter may be granted to Public Service of New Hampshire.
^t The weighted average based on allowances allocated, assuming maximum proceeds in discretionary states, at initial percentages.

First RGGI Auction Results

The first U.S. GHG allowance auction was held on September 25, 2008, and the results were publicized four days later on September 29, 2008. More than 12.5 million allowances were offered, while bidders placed bids for almost 52 million allowances. Bids came from 59 different entities from across the energy, environmental, and financial sectors, although the majority of buyers were

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utilities. The auction cleared at a price of \$3.07 per allowance, generating \$38.5 million in total for state programs. Prices have been higher on the secondary market, which is currently managed independently by the Chicago Climate Exchange, a private sector enterprise. As of December 1, 2008, the price for 2009 allowances was \$4.40.

The second auction will be held December 17, 2008. All ten RGGI states are expected to participate in this auction, and 31.5 million allowances will be offered.

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