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RGGI Program Review: A Model to Reduce Uncertainty in State Carbon Plans

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Acronyms

CEMS	Continuous emissions monitoring system
CO_2	Carbon dioxide
CPP	Clean Power Plan
EGU	Electric generation unit
EPA	US Environmental Protection Agency
GHG	Greenhouse gas
ISOs	Independent system operators
MOU	Memorandum of understanding
MW	Megawatt
NO_x	Nitrogen oxide
NRDC	Natural Resources Defense Council
NY DEC	New York State Department of Environmental Conservation
RGGI	Regional Greenhouse Gas Initiative
RGGI COATS	RGGI CO_2 Allowance Tracking System
SO_2	Sulfur dioxide

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Introduction

The Regional Greenhouse Gas Initiative (RGGI), which started in 2009, originated from an agreement to develop a carbon cap-and-trade program to reduce power sector carbon dioxide (CO_2) emissions in the Northeast and Mid-Atlantic regions of the United States.[1]

In 2003, Governor George Pataki of New York sent a letter to the governors of other Northeast and Mid-Atlantic states suggesting a regional strategy to lead the nation in combating global climate change.[2] In December 2005, seven states—Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont—signed a Memorandum of Understanding (MOU) to develop such a program. Two years after that three additional states, Maryland, Massachusetts, and Rhode Island, also formally signed on.

The MOU reflects those states' agreement to adopt basic design elements of a cap-and-trade program and to jointly develop a "model rule" that would serve as a prototype for the development of their respective state regulations necessary to implement the program.[3] In the MOU, the states also agreed to undertake a "comprehensive review of all components of the Program," including but not limited to program success, impacts, additional emissions reductions, imports and emissions leakage and the effectiveness of the use of offsets. [4] RGGI later characterized what has become known as a "program review" as "a rigorous and comprehensive evaluation, supported by an extensive regional stakeholder process that engaged the regulated community, environmental nonprofits, consumer and industry advocates, and other interested stakeholders."[5, 6]

RGGI, which went into effect in 2009, conducted its first program review in 2012–2013; a second review is currently underway and is expected to be completed later this year.[7]

A Bipartisan Initiative

RGGI has had support from both major political parties from its inception to the present day. The ten states that convened in response to New York's call in 2003 for a regional greenhouse gas strategy represented six Republican and four Democratic Administrations. In 2005, the seven states that signed the MOU to develop what would become RGGI were at the time governed by three Republicans, Pataki, Jodi Rell (CT), and Jim Douglas (VT), and four Democrats, Ruth Ann Minner (DE), John Baldacci (ME), John Lynch (NH), and Richard Codey (NJ).

In 2007, Gov. Deval Patrick (D-Mass.), Gov. Donald Carcieri (R-R.I.), and Gov. Martin O'Malley (D-Md.) signed an amended MOU, bringing the total number of states to ten.

The State of New Jersey only participated for the first three-year compliance period that started in 2009, and its withdrawal became effective December 31, 2011.

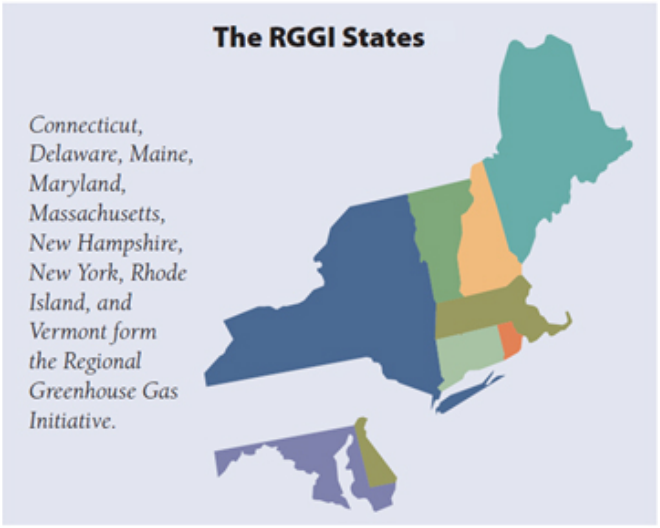
[1] Regional Greenhouse Gas Initiative. (2005). Memorandum of Understanding. Retrieved from http://rggi.org/docs/mou_final_12_20_05.pdf
[2] New York State Department of Environmental Conservation (DEC). (2006, August 15). DEC Announces Final Model Rule to Help States Implement RGGI (Press release). Retrieved from http://www.dec.ny.gov/press/12440.html
[3] RGGI MOU, 2005, Section (3) (A).
[4] RGGI MOU, 2005, Section (6) (D).
[5] RGGI. *2012 Program Review*. Retrieved from http://www.rggi.org/design/program-review.
[6] RGGI. (2012). *Final Program Review Materials: Summary of Recommendations to Accompany Model Rule Amendments*. Retrieved from http://www.rggi.org/docs/ProgramReview/FinalProgramReviewMaterials/Recommendations_Summary.pdf.
[7] See: RGGI, *2012 Program Review*; and RGGI. *2016 Program Review*. Retrieved from http://www.rggi.org/design/2016-program-review

The purpose of this paper is to examine RGGI's program review mechanism. Experience with RGGI has illustrated the importance of including a comprehensive review mechanism that assesses the program's functionality to ensure its economic, environmental, and equitable performance, and the authors believe that other jurisdictions could benefit from lessons learned by RGGI states and stakeholders. For jurisdictions that are designing plans to reduce GHG emissions, an appreciation of the benefits and challenges associated with a built-in review process could afford them an opportunity to accommodate some of the uncertainty inherent in regulatory systems and to make valuable adjustments to those plans when necessary.

To this end, we set out to understand how to design such a process, the resulting major benefits and challenges of the program review, and important lessons associated with designing such a process. As discussed further below, the RGGI program has benefitted from transparency, receiving regular feedback from participants, and being able to make needed program adjustments in a publicly accessible way. The authors consulted with more than a dozen individuals, including current and former RGGI regulators, stakeholders, and others, to solicit their insights into the benefits and challenges associated with RGGI's program review.[8] While anecdotal in nature, these interviews were crucial to the understanding of the program review that we have developed. The authors would like to thank each person who took the time to talk with us.

Part I of this paper, "Background and Design," reviews the major features of RGGI's cap-and-trade program design. Part II, "Program Review," considers the manner in which the program review is conducted and the major issues addressed in the 2012-13 review. Part III, "Observations for States," articulates the major lessons that program designers can consider in their design of regulatory programs to reduce GHG emissions, in particular cap-and-trade programs.

Figure 1



Source: Regional Investment of RGGI CO_2 Allowance Proceeds*, 2014*

[8] Dale Bryk, Natural Resources Defense Council; Director Philip Cherry and Valerie Gray, Delaware Department of Natural Resources and Environmental Control; Derek Furstenwerth, Calpine; Marissa Gillet, Maryland Public Service Commission; Brian Jones, M.J. Bradley; William Lamkin, Massachusetts Department of Environmental Protection; Professor Leigh Raymond, Purdue University; Franz Litz, Principal Litz Energy Strategies; Peter Shattuck and Jordan Stutt, Acadia Center; Deputy Commissioner Jared Snyder and Lois New, New York Department of Environmental Conservation; and Chris Wentlent, Constellation and Exelon Company. Where interviewees were comfortable being quoted, we have specified their names. Where they were not, we indicate by simply describing the person interviewed, for example, "According to an industry stakeholder…."

Part 1: Background and Design

Developing RGGI

In September 2003, Governor Pataki "initiated the RGGI process by sending a letter to the governors of the Northeastern and Mid-Atlantic states inviting them to pursue 'a course of cooperation' and work together 'to develop a strategy that will help the region lead the nation in the effort to fight global climate change.' "[9]

When state regulatory staff (RGGI staff)[10] met to develop the outlines of a program that would be memorialized in an MOU two years later, they were conscious of not only being from different states, but also different regulatory agencies with different priorities and mandates.[11] Recognizing that development of a regional carbon trading program would be both an environmental and energy challenge, each state sent a representative air regulator as well as a staff person from the state's energy regulatory body, typically a public utility commission.

Many of these regulators had worked together on regional issues in the past. The air regulators had worked on joint responses to various Midwest air pollution challenges, and had coordinated on market-based pollution programs related to emissions of sulfur dioxide (SO_2) and nitrogen oxides (NO_x). Energy regulators had a history of cooperation on the development of regional wholesale electricity markets. New England's energy and environmental regulators, and that region's grid operator, also had collaborated on the drafting of a model rule for distributed generation, to ensure that the region's environmental and reliability standards continued to be satisfied during periods of peak electricity demand. However, this was the first time that both environmental and energy regulators had engaged on an effort together at such a scale. Earlier efforts to develop consistent procedures for distributed generation (small-scale generators) and on procedures for when such units would be dispatched laid an effective groundwork for this more extensive RGGI effort. These early efforts helped to reveal constraints that can be imposed on the energy and environmental disciplines, and areas of opportunity, where value to the respective programs could be added through cooperation and understanding. These regulators understood that electricity generation is a significant environmental issue and that environmental compliance can have profound effects on the energy sector.

The RGGI staff agreed that their planning goal was to develop:

> A program to reduce carbon dioxide emissions from power plants in the participating states, while maintaining energy affordability and reliability and accommodating, to the extent feasible, the diversity in policies and programs in individual states.[12]

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[9] RGGI. (2006, August 15).
States Reach Agreement on Proposed Rules for the Nation's First Cap-and-Trade Program to Address Climate Change [Press release]. Retrieved from http://www.rggi.org/docs/model_rule_release_8_15_06.pdf

[10] RGGI's program review was conducted by a group of state regulators formally designated in 2009 as the "RGGI Program Committee." For purposes of this paper, however, state regulatory staff will be simply referred to as "staff" or "RGGI staff."

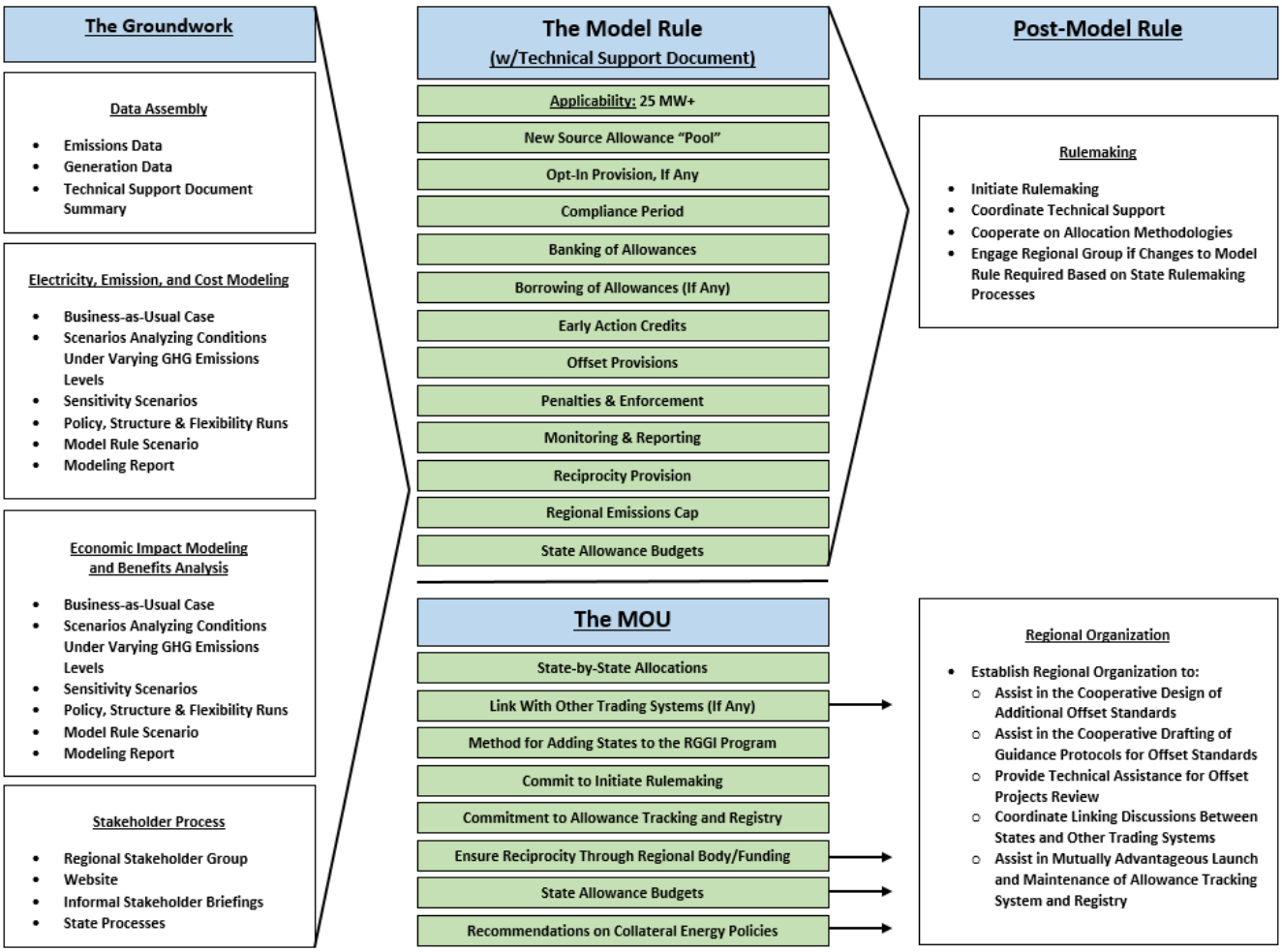
[11] RGGI. (2003, September 29). *Goals, Proposed Tasks, and Short-Term Action Items*. Retrieved from http://www.rggi.org/docs/actionplanfinal.pdf

[12] Ibid.

They developed a flow chart (see Figure 2) to describe the process and illustrate their plans to others.

Figure 2

RGGI Planning Chart



Source: RGGI

During these early planning years, the RGGI staff recognized the need for education on various aspects of a GHG emissions reduction program, diverse stakeholder involvement, and a transparent process. As a result, staff arranged numerous stakeholder meetings and topical workshops, which together formed the initial model for what would later become program reviews. These stakeholder meetings and topical workshops provided a method of:

1. Informing the public and stakeholders about their "deliberations, and draft and final work products;"
2. Providing themselves with early input on their ideas and draft work;
3. Maintaining a dialogue with stakeholders; and

4. Establishing a means for the public and stakeholders to submit formal comments to the RGGI staff at key decision points in the RGGI process. [13]

As they engaged on these topics and improved their understanding of appropriate program design options, the RGGI staff also relied on a large group of experts from the energy and environmental fields known as the Resource Panel.[14] In addition to consulting with the RGGI staff, the Resource Panel helped organize a number of topical workshops to help educate staff and stakeholders about program design options and issues. For example, between 2004 and 2006, RGGI conducted the following workshops:

- "Electricity Markets, Reliability, and Program Design;"
- "Allowance Allocations;"
- "Offsets;"
- "Implementing the Minimum 25% Public Benefit Allocation;"[15] and
- "Electric Imports and 'Emissions Leakage.' "[16]

Experts from many disciplines and backgrounds—academia, think tanks, power companies, and environmental and energy NGOs—all supported the RGGI staff members in their effort to better understand the many questions they faced in designing and starting a power sector cap-and-trade program.[17] Expert disciplines included economics, engineering, finance, electric power markets, and environmental and energy law and regulation.

How RGGI Works

In order to appreciate the value of RGGI's program review mechanism, it is necessary to first understand the basic elements of the RGGI program. The following section discusses the program's central features.

The Structure

While RGGI is generally considered a single program, strictly speaking, it is a collection of individual state programs that have undertaken measures to ensure their operation across nine-state region. This

[13] See, e.g., RGGI. (2004, January 18). *Draft Outline of Stakeholder Process*. Retrieved from http://rggi.org/docs/stakeholderprocess.pdf

[14] Resource Panel members include: the Regulatory Assistance Project (RAP); Natsource; Northeast States Coordinated Air Use Management (NESCAUM); PJM Interconnection; World Resources Institute; Pew Center; ISO-NE; NY ISO; and Resources for the Future (RFF). "A broad range of organizations participated as stakeholders in the development of RGGI. In addition, a number of organizations acted as Resource Panel members, helping the participating states to develop their approaches to a regional cap-and-trade system." See: http://www.rggi.org/docs/Stakeholder_Resource_Organizations.pdf

[15] RGGI. (2006, July 20). Workshop to Support the Regional Greenhouse Gas Initiative on the Topic: Implementing the Minimum 25% Public Benefit Allocation [Agenda]. Retrieved from http://www.rggi.org/docs/rggi_agenda_7_20_06.pdf

[16] Workshop on Electric Imports and "Emission Leakage" In Support of the Regional Greenhouse Gas Initiative. See also, more generally, http://www.rggi.org/design/history/topical_workshops

[17] See, e.g., presentations on auctions: general principles and procedures, Charles Holt, University of Virginia; spectrum auctions, Evan Kwerel, US Federal Communications Commission; Republic of Ireland's auction, Ken Macken, Ireland EPA, State of Virginia's NOx auction, Bill Shobe, University of Virginia.

arrangement allows the states to preserve their legal sovereignty while at the same time coordinating administrative functions across the entire region.

As already noted, the MOU entered into by the RGGI states provided for the development of a "model rule" to serve as a blueprint for individual state regulations. Relying on the model rule, each of the RGGI states developed their respective regulations and regulatory programs that correspond in large part to each other. Where differences exist between state programs, these chiefly relate to how allowance auction revenues would be used and administered. Various aspects of the program are explored in further detail below.

While each state operates under its own regulatory authority, all the RGGI states share a common administrative organization, "RGGI Inc.," whose Board of Directors is comprised of two representatives from each RGGI state, an environmental regulator and an energy regulator.

RGGI, Inc. has no regulatory or enforcement authority, all of which stays with each state, but instead provides administrative and technical services to support states in the operation of their respective programs. These functions include the development and maintenance of systems to report data from emissions sources subject to RGGI, and auction and track CO_2 allowances. RGGI Inc. is responsible for monitoring the CO_2 allowance auction and market. It also provides technical assistance to participating states in reviewing applications for emissions offset projects and evaluating proposed changes to the States' RGGI programs.

It should also be noted that the MOU contains provisions for additional states to join[18] and for states to leave RGGI.[19]

Applicability

RGGI applies to fossil fuel-fired electric generation units (EGUs) serving a generator of 25 megawatts (MW) or larger, an approach that was largely predicated on the availability of data under existing federal regulations.[20] Generators of this size were selected because RGGI staff determined that units of that size in the participating states were responsible for approximately 95 percent of the electric generation sector's CO_2 emissions. The initiative also defined the term "fossil fuel-fired" depending on a unit's in-service date.[21]

In order to establish a region-wide list of affected sources, RGGI states conducted an inventory of all electricity generating units, and compiled or calculated recent historical CO_2 emissions from those units,

[18] See MOU Section 5(A) "New Signatory States," http://rggi.org/docs/mou_final_12_20_05.pdf.
[19] MOU Section 5(B) "Withdrawal of a Signatory State," provides that states can withdraw from RGGI upon providing a 30-day notice. Remaining states agree to undertake measures to adjust allowance usage to account for the reduction in generation units that are subject to the program. The MOU also provides for RGGI Inc. by-laws to articulate any further requirements.
[20] The emissions monitoring rules for Clean Air Act's Title IV Acid Rain Program are found in federal regulations at 40 C.F.R. Part 75, and those generators subject to the Acid Rain program correspond largely but not entirely to the 25 MW and larger category of resources currently covered by RGGI. For example, there are some exceptions to this statement; in the State of Massachusetts, there are some RGGI units that are not subject to Title IV. See also notes 42-44 and accompanying text below.
[21] If a unit commenced service on or after January 2005, it would be considered fossil fuel-fired provided that fossil fuel comprised more than five percent of its total annual heat input. If a unit commenced service on or before January 2005, it would be considered fossil fuel-fired provided that fossil fuel comprised more than 50 percent of its total annual heat input.

relying on established data sources.[22] To fill in gaps in the inventory, the states revised the lists to add missing and remove exempt or duplicate units, used additional unit-level state data (where available), incorporated stakeholder feedback, and obtained generation data from wholesale market independent system operators or ISOs.

Compliance Periods and Cap Level

The RGGI states implemented a three-year compliance period, rather than the one-year period used by the Acid Rain Program and already familiar to regulated entities. This decision was made in part because of concern over possible allowance price volatility and the conclusion that compliance could be ensured even over a longer period. RGGI's first three-year compliance period started on January 1, 2009.

The RGGI MOU established a stable cap for the ten states' electric sector CO_2 emissions of approximately 188 million short tons (170 million metric tons) per year from 2009 through 2014. The cap was to decline at a rate of 2.5 percent per year for four years from 2015 through 2018. This approach results in a 2018 annual emission budget that is ten percent lower than the initial 2009 annual emission budget.[23]

At the end of the first compliance period in 2011, the state of New Jersey withdrew from RGGI.[24] As further discussed in Section II, based on decisions informed by the program review, the nine remaining RGGI states reset the cap through a consensus process, lowering it to 91 million short tons (83 million metric tons) of CO_2 per year (to reflect current emissions) while extending the 2.5 percent per year declining trajectory from 2015 through 2020 (from a 2018 end date).[25]

Cost Containment

Market-based emission reduction mechanisms such as cap-and-trade provide the opportunity to meet environmental goals at lower cost than might otherwise occur under a more prescriptive approach. Market-based approaches provide compliance flexibility and incentivize the lowest-cost abatement opportunities across the entire market. This has been borne out in practice across multiple jurisdictions, including the RGGI states. However, due to a perception that even a flexible market-based regulatory program could experience price volatility and result in the imposition of unwanted costs, RGGI originally adopted several explicit cost containment mechanisms.[26]

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[22] These sources included the US Energy Information Administration (EIA) Form EIA-767 data: Annual Steam-Electric Plant Operation and Design Data (http://www.eia.gov/electricity/data/eia767); the EPA's Air Markets Program Data (http://ampd.epa.gov/ampd); the EPA's Emissions & Generation Resource Integrated Database (http://www.epa.gov/cleanenergy/energy-resources/egrid); and state emissions inventories and fuel consumption data where available.

[23] RGGI's initial regional cap was 188 million short tons of CO_2 per year, which staff indicated was approximately four percent above annual average regional emissions during the period of 2000 through 2004.

[24] The annual RGGI cap, including New Jersey (NJ), was initially set at 188.1 million tons from 2009-2014. NJ accounted for 22.9 million of that 188.1 cap, bringing the regional cap down to 165.2 when NJ departed after 2011. The new cap (beginning in 2014) was set based on actual emissions, so it is difficult to know precisely where the cap would have been set had NJ stayed in the. Without NJ, the cap reduced by 45% went from 165.2 to 91.0. Had NJ's proportional share of the regional cap remained the same, a 45% reduction in the cap would have resulted in the cap going from 188.1 million to 103.6 million.

[25] See RGGI, *2012 Program Review*.

[26] As discussed in the following sections, RGGI would later reject these mechanisms and settle upon a simpler approach.

RGGI established two mechanisms that could, under certain circumstances, temporarily (a) extend program compliance periods, and (b) expand the ability to use offsets for compliances to mitigate allowance prices. The "Compliance Period Safety Valve" was designed to further extend RGGI's three-year compliance period under certain conditions.[27] RGGI developed additional compliance flexibility by allowing the use of offsets which, as explained below, are emissions reductions outside of the capped electric sector. While the RGGI limits the source and amount of offsets available for compliance purposes, it developed another cost containment mechanism that could expand both the allowable geographic scope and the amounts of offsets under certain circumstances.[28]

RGGI allows limited use of CO_2 offset allowances, which are defined as an offset allowance representing a "project-based greenhouse gas emission reduction outside of the capped electric power generation sector."[29] RGGI developed offset protocols primarily as a cost-containment mechanism. The ability to increase the number of available allowances through limited development of offset projects was considered a way to mitigate potential allowance price increases. Use of offset allowances for compliance by a unit is limited to an amount equal to three percent of a unit's reported CO_2 emissions.

RGGI states specified five eligible offset project categories:

- Landfill methane capture and destruction;
- Reduction in emissions of sulfur hexafluoride in the electric power sector;
- Sequestration of carbon attributable to US forest projects, including reforestation, improved forest management, avoided conversion);[30]
- Reduction or avoidance of CO_2 emissions from natural gas, oil, or propane end-use combustion attributable to end-use energy efficiency in the building sector; and
- Avoided methane emissions from agricultural manure management operations.[31]

The RGGI States chose to adopt these specific offset categories—what RGGI called a "standards-based approach"—rather than allowing for the submission of offset applications on a case-by-case basis. RGGI states reasoned that this would help all parties understand requirements and thereby provide greater certainty to developers. They concluded that it would also reduce both the administrative burden on

[27] RGGI MOU, Section (2) (E), Compliance Period Safety Valve. This mechanism would extend the compliance period by as much as three additional one-year periods if, after the market-settling period (i.e., first 14 months of the three-year compliance period), program allowance prices exceeded the safety valve threshold for an established price point ($10 per allowance) for an extended period (12-month rolling average).

[28] RGGI MOU, Section (F) (3), Offset Expansion Safety Valve. The mechanism that would expand the use of offsets was designed in a similar manner to the compliance period safety valve. If, after the market settling period (i.e., first 14 months of the compliance period), the average regional spot price for CO_2 were to equal or exceed $7 for an extended period (12-month rolling average), referred to as an "offset trigger event," offsets could be used from anywhere in North America and could cover up to five percent of an entity's reported emissions. Furthermore, if the trigger occurs twice in two consecutive 12-month periods, the geographic availability of offsets would be expanded further and could include units from international trading programs. The amount of offsets that an entity could use would also be expanded beyond five percent for the first three years of a compliance period up to an amount equal to 20 percent of an entity's reported emissions if the compliance period was extended beyond three years.

[29] For more on the RGGI approach to CO2 offsets, see: http://www.rggi.org/market/offsets

[30] The states of Connecticut and New York also allow for offsets associated with "afforestation," i.e., establishing forest in an area where there was none.

[31] See: http://www.rggi.org/market/offsets

RGGI states and developer transaction costs. They also established these requirements to ensure that authorized offset allowances would represent CO_2-equivalent emissions reductions or carbon sequestration that is "real, additional, verifiable, enforceable, and permanent."[32]

Allowance Distribution

The RGGI cap covers aggregated electric sector emissions from all of the participating states, and each allowance permits a regulated source to emit one short ton of CO_2. The emission cap is comprised, in total, of the sum of individual state emission budgets, which were agreed upon among the states based on proportional CO_2 emissions.[33]

The auctions are conducted in accordance with the authority of each state offering CO_2 allowances for sale in that auction, and each state retains its authority to make regulatory determinations related to the conduct of the auction.[34] Auction proceeds are then returned to the states based on the proportion of the allowances they contributed to the auction.[35]

The RGGI states distribute approximately 90 percent of CO_2 allowances through regional allowance auction held quarterly.[36] They follow a single-round, uniform-price, sealed-bid auction format. This is an approach in which participants submit confidential bids for the amount of allowances they wish to purchase. Bidders receive the quantity of allowances specified in their winning bids at a uniform clearing price.

RGGI uses auctions to allocate allowances rather than freely allocating allowances because, in the wholesale electricity markets in the RGGI region, electric generators would reflect the market value of free allowances in the price they bid into the market. [37] In cases where the marginal price of electricity is set by a generator that has added this allowance value to its bid, all generators receive the added value of the allowance that was freely allocated.[38] In circumstances where this results in cost recovery exceeding compliance costs for individual units, this produces a windfall profit, i.e., a transfer of wealth from electricity customers to electricity producers who received the allowances at no cost.[39]

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[32] See: https://www.rggi.org/market/offsets.

[33] For an illustration of this, see: National Association of Clean Air Agencies (NACAA). *Implementing EPA's Clean Power Plan: A Menu of Options*. Chapter 24, Figure 24-5, p. 24-0. Retrieved from http://www.4cleanair.org/NACAA_Menu_of_Options

[34] For further information on RGGI auction processes and results, see: http://www.rggi.org/market/co2_auctions

[35] For example, between September 2008 and December 2013, the RGGI states held 22 auctions in which they sold current and future control period allowances. First control period (January 1, 2009 to December 31, 2011) allowances sold at a weighted average price of $2.31, with prices ranging from $3.51 to $1.86. Second control period (January 1, 2012 to December 31, 2014) allowance prices ranged from $3.21 to $1.86 and sold at a weighted average price of $2.52. Through 2012, RGGI raised just under $1 billion for the participating states. RGGI, *Regional Investment of RGGI CO2 Allowance Proceeds, 2012, page 6*. For an illustration of this, see NACAA, Chapter 24, Table 24-1, p. 24-9.

[36] "Fact Sheet: RGGI CO_2 Allowance Auctions," https://www.rggi.org/docs/RGGI_Auctions_in_Brief.pdf, accessed June 2, 2016.

[37] More information about ISOs is available at: http://www. isorto.org/about/default

[38] In a competitive wholesale power market such as those in the RGGI region, the bid submitted by the most expensive generator that dispatches to meet system load will set the market-clearing price. All generators receive this market-clearing price, even if their generation costs are significantly lower than the marginal unit.

[39] For a more extensive discussion of carbon pricing effects in organized wholesale markets, see: Subcommittee on Energy and Environment, U.S. House Energy and Commerce Committee, (2009, March 12) (Testimony of Sonny Popowski, Consumer Advocate of Pennsylvania); see also: Cowart, R. (2008). Carbon Caps and Efficiency Resources, Vermont Law Review, (33), 201-223.

In its 2011 study, *The Economic Impacts of the Regional Greenhouse Gas Initiative,* the Analysis Group observed that:

> Auctioning allowances and distributing allowance proceeds to states in this way had an important impact on program outcomes since it meant, in effect, that the public benefitted by transferring the value of allowances to market at market prices (rather than for free, as was done in the SO_2 and NO_X allowance programs).[40]

Allowance Tracking

The RGGI CO_2 Allowance Tracking System (RGGI COATS) is an electronic platform that records and tracks CO_2 allowances and other program data for each RGGI state. Specifically, the system enables regulators to view program and market data reports regarding:

- CO_2 allowance transactions (identifying the date, price, and type of transaction);
- COATS accounts (listing accounts registered);
- COATS account representatives (showing individual contact details for all accounts);
- RGGI sources (listing each regulated power plant and its location);
- Owners/operators of RGGI sources (showing the corporate affiliation of owners and operators for each regulated power plant);
- Special approvals (detailing allowance allocations made by states);
- Offset project applications and approvals; and
- CO_2 emissions from RGGI sources (showing emissions for each regulated power plant and summary CO_2 emissions for the nine-state region).[41]

The data are not only critical for program administration, but for market monitoring and reporting as well. Public reporting based on RGGI COATS also provides open access, enabling viewing and downloading of data related to CO_2 allowance market activity.

Emission Monitoring and Reporting

The RGGI states have based their emissions monitoring and reporting requirements on existing requirements that have already been established under other air quality programs.[42] The Clean Air Act's Title IV Acid Rain Program established pursuant to the Clean Air Act Amendments of 1990 requires coal-fired EGUs to install and operate continuous emissions monitoring systems (CEMS).[43] The EPA has also developed monitoring, recordkeeping and reporting requirements for CEMS and these rules are found in

[40] Hibbard, P., Tierney, S., Okie, A., & Darling, P. (2011, November). *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States.* Analysis Group, p. 31. Retrieved from http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf

[41] See RGGI CO_2 Allowance Tracking System Data. Retrieved from http://www.rggi.org/market/tracking/public-reporting

[42] The Clean Air Act Amendments of 1990 set a goal of reducing annual SO_2 emissions by ten million tons below 1980 levels, requiring a two-phase tightening of the restrictions placed on fossil fuel-fired power plants.

[43] The Act requires the EPA to specify the requirements for such equipment and to specify any alternative monitoring system that is demonstrated as providing information with the same precision, reliability, accessibility, and timeliness as CEMS.

federal regulations at 40 C.F.R. Part 75.[44] The data produced pursuant to these regulations are often referred to as "Part 75 data."

The universe of Title IV generators corresponds largely but not entirely to the 25 MW and larger category of resources currently covered by RGGI. Part 75 data are not only used for Title IV purposes. RGGI has already appropriated this data source, and uses it to populate CO_2 emission information contained in the RGGI COATS. According to RGGI, "regulated power plants are required to report data necessary to quantify CO_2 emissions to RGGI participating states," and:

> CO_2 emissions data from each regulated power plant is recorded in the EPA Clean Air Markets Division database in accordance with state CO_2 Budget Trading Program regulations and U.S. EPA regulations at 40 CFR Part 75 and transferred to RGGI COATS.[45]

Compliance and Enforcement

Unlike command-and-control programs in which individual emitters have to demonstrate compliance with a specified emissions limitation for each pollutant, under a cap-and-trade program, compliance is determined differently. It is structured to ensure that emitters have the requisite allowances at the end of the compliance period, and so there are no economic benefits associated with not having sufficient allowances. EGUs in the RGGI states must surrender allowances equal to their reported emissions during a compliance period.

The RGGI states have also established compliance and enforcement rules, and related provisions, for other aspects of the program including emissions reporting, allowance tracking, allowance retirement, and auction participation. Furthermore, no RGGI provisions excuse EGUs from compliance with any otherwise applicable provisions of state and federal laws or regulations.

The RGGI program uses an independent market monitor to assess allowance auction performance, and to watch for market manipulation, thereby protecting and fostering competition, which in turn increases the confidence of the states, participants, and the public in the allowance market.[46] RGGI contracts with an independent firm for independent monitoring of the competitive performance and efficiency of the RGGI allowance market. The market monitor:

- Identifies attempts to exercise market power, collude, or otherwise manipulate prices in the auction and/or the secondary market;
- Assesses whether the auctions are administered in accordance with the noticed auction rules and procedures; and
- Makes recommendations regarding proposed market rule changes to improve the economic efficiency of the market for RGGI allowances.[47]

Before the states approve auction results, the market monitor reviews each auction and issues a report containing its assessment. The market monitor's report is included with the public release of auction

[44] There are also provisions for "initial equipment certification procedures, periodic quality assurance and quality control procedures, recordkeeping and reporting, and procedures for filling in missing data periods." Refer to the EPA Continuous Emissions Monitoring Fact Sheet at: http://www.epa.gov/airmarkets/emissions/continuous-factsheet.html.
[45] https://www.rggi.org/market/tracking/public-reporting.
[46] For RGGI market monitor reports, see: http://www.rggi.org/market/market_monitor
[47] Ibid.

results. The market monitor also issues quarterly and annual reports on the secondary market, i.e., market activity occurring beyond the RGGI auction.

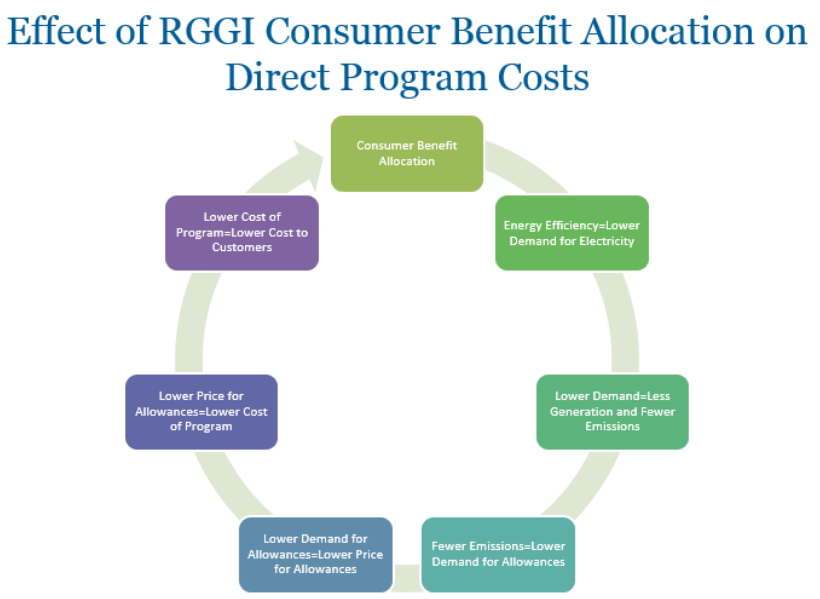
Use of Allowance Proceeds

In initial discussions leading up to the adoption of the 2005 MOU, the RGGI states agreed that each would have full discretion in its use of allowance auction proceeds. On the basis of subsequent discussions, however, each state agreed to allocate a quarter of its allowance revenues for "consumer benefit" or "strategic energy" purposes defined in the MOU as:

> The use of allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon emitting energy technologies, and to stimulate or reward investment in the development of innovative carbon emissions abatement technologies.[48]

Investment in end-use energy efficiency was viewed as a critical complementary policy to keep consumer impacts manageable. See Figure 3, below. Energy efficiency's demand reduction and related allowance price suppression effects were also considered an important key to reducing potential emissions leakage in areas bordering the RGGI region.

Figure 3

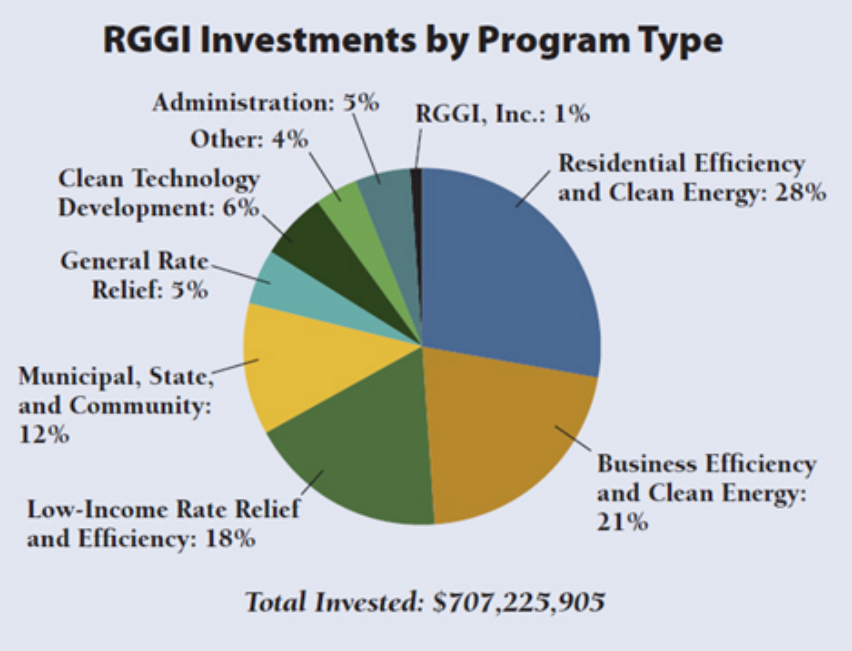


Source: Farnsworth, D'Antonio, & Pike-Biegunska, Climate Policy and Affordability: Advocacy Opportunities in the Northeast. *Regulatory Assistance Project, 2009*

[48] RGGI MOU, Section (2)(G)(1).

In practice, the RGGI states have gone beyond investment levels specified in their agreement to allocate 25 percent for consumer benefit and strategic investment, and have invested significant amounts of their auction revenues in clean energy programs. During its first three-year compliance period (2009-2012), when the RGGI states raised more than $984.7 million in auction proceeds, they invested $707.2 million in state clean energy programs, as shown in Figure 4. During the second three-year compliance period (2012-2014), the RGGI states raised $1.0 billion in allowance proceeds then reinvested that back into their economies.

Figure 4

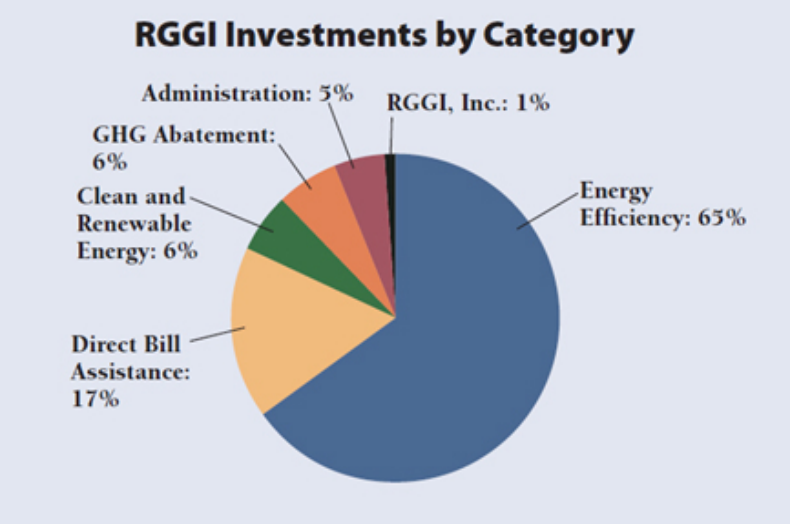


Source: Regional Investment of RGGI CO_2 Allowance Proceeds*, 2014*

RGGI reports that "more than 73 percent of 2012 RGGI investments, and approximately 65 percent of cumulative RGGI investments to date, fund energy efficiency programs in the region." More than six percent of RGGI investment in 2012, and six percent of overall investment to date, funds clean and renewable energy programs, including grants and low-interest loans.[49] Figure 5 shows the portion of total RGGI auction proceeds directed toward different categories of investment.

[49] Ibid.

Figure 5



Source: Regional Investment of RGGI CO_2 Allowance Proceeds*, 2014*

Costs and Cost-Effectiveness

RGGI 's cap-and-trade program has proven to be cost-effective for decreasing carbon emissions. Like other cap-and-trade programs, it allows regulated entities to weigh all available options and choose the least-cost means of compliance. It also allows differential costs of emissions reduction between two regulated entities to be exploited to the benefit of both parties through their ability to trade allowances.

One aspect of the RGGI program approach that is not always sufficiently acknowledged is that, in addition to funding clean energy resources like energy efficiency and renewable energy, the program achieves GHG reductions separate from and in addition to the reductions in the capped sector by reinvesting some of the auction revenues in other sectors. For example, some of the energy efficiency investments that states have made with RGGI auction proceeds have been targeted to reduce the consumption of oil, propane, and natural gas for heating buildings. This reduces GHG emissions outside of the electricity sector without in any way relaxing the cap.

In 2011, the Analysis Group produced a study that assessed the economic impacts of RGGI's first three years (2009-2011) and

found that power plant owners and other auction participants spent $912 million to purchase CO_2 allowances in the first three years of RGGI, but the reinvestment of these revenues by states added $1.6 billion in *net* economic value to the region. [50]

> **Power plant owners spent $912 million to purchase CO_2 allowances in the first three years of RGGI, but the reinvestment of these revenues by states added $1.6 billion in net economic value to the region.**
>
> *Analysis Group study*

[50] Hibbard, P., Tierney, S., Okie, A., & Darling, P. (2011, November). *The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States.* Analysis Group, p. 31, footnote 32. Retrieved from http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf

Part II: Program Review

The RGGI program review, called for in the 2005 MOU, is an evaluation of the entire program by representatives from the RGGI state environmental and energy regulatory agencies, with the help of stakeholders, and the public, and has produced significant improvements to the program's design and effectiveness.

The discussion in this section looks briefly at the mandate, the process, and results of the 2013 program review. We then focus on the engagement itself and its benefits, which include:

1. Transparency;
2. Multi-perspective feedback;
3. A means of testing models for program improvement; and
4. A significant degree of stakeholder buy-in to program modifications.

The Mandate

As the RGGI states deliberated over how to design an electric sector carbon program, they were keenly aware that this had not been done before and that—due to the inherent complexity of developing a new market for CO_2 emissions linked to a market for electricity—they would need to proceed with caution and deliberation. They would also need to be certain that their program was producing the results that the RGGI states were seeking. These concerns prompted the decision to agree to revisit the program goals, design elements, and effectiveness after the completion of the first three-year compliance period (2009-2011). In the 2005 MOU, the RGGI states memorialized their agreement to conduct a review in 2012 of all components of the program, and to determine whether program changes were warranted. Components that the states initially agreed to consider included:

1. Program Success: whether the program has been successful in meeting its goals.
2. Program Impacts: the impacts to price and electricity system reliability.
3. Additional Reductions: whether additional reductions should be implemented.
4. Imports and Emissions Leakage: the effectiveness of any measures put in place to control emissions leakage.
5. Offsets: the effectiveness of the offsets component, with attention to price, availability, and environmental integrity.[51]

In addition to the original agreement to review various components of the program, the actual circumstances in which RGGI found itself at the end of its first compliance period dictated the specific focus that the review would take. The program had excess supply of allowances by comparison to the region's actual emission levels. There was also the concern that, if the emissions cap were adjusted downward to reflect actual emissions, the cost control measures that were in place would not be effective in controlling costs. Furthermore, the RGGI states wanted to assess basic program administration to see if there were areas for improvement.

[51] RGGI MOU, Section (2) (F) (6) (D) (1-5).

The Process

In practice, RGGI's first program review was not only comprehensive and in-depth, but commenced soon after the program's January 2009 launch. Starting in September 2010, the RGGI states convened a 2 ½-year series of more than a dozen stakeholder workshops, webinars, and learning sessions. RGGI's extensive stakeholder process provided a venue for representatives of the regulated community, nonprofits, and consumer and industry advocates to engage with the RGGI states on topics related to program design, operation, and effectiveness.

As illustrated below, program review involved a significant amount of work for the RGGI staff and commissioners.[52] This involved both organizational work and frequent presentations on substantive topics. The RGGI staff took stock of current and past emissions inventory as reported in the RGGI COATS emission tracking system. The emissions inventory, trends and market price data formed some of the raw data upon which the energy system modelling occurred. Implementation of other federal EPA air pollution programs including the Cross-State Air Pollution Rule (CSAPR) and the Mercury and Air Toxics Rules (MATS) were factored into the modelling. Implementation of the CSAPR and MATS rules impacted emitting unit's costs structure and thus impacted levels of retirements going forward.

The RGGI states also relied on a panel of experts, and conducted a number of learning sessions, webinars, and workshops to address relevant issues facing the program and stakeholders.[53] For example, on October 11, 2011, RGGI hosted a "Learning Session on Electricity Markets and Electricity Imports" with presentations from the California PUC, Columbia Law School Center for Climate Change Law, Goldman Sachs, NY ISO, and RAP.

The RGGI states also engaged consultants such as Northeast States for Coordinated Air Use Management (NESCAUM), ICF International, and the Economic Development Research Group to conduct modeling to evaluate different revised emission cap scenarios and to gauge, among other things, the potential cost effects of those approaches. RGGI also solicited and reviewed an extensive number of comments from stakeholders over the program review period.[54]

The appropriate level of effort associated with the program review was a topic raised in our interview with Philip Cherry, Director of the Delaware Division of Energy and Climate. He noted that, for RGGI's initial review and even the current review, a three-year period seems like an appropriate amount of time to conduct this work. For example, in 2013, there was a need to adjust the cap level to better reflect actual emissions, and today, with the Clean Power Plan in the near future, the states need to be as prepared as possible to make the transition from a state to a federal program. However, Cherry said, "In the future, because this takes a lot of time and money, maybe a five-year review period would be more suitable."[55]

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[52] See, e.g., Program Review Status and Stakeholder Meeting Overview [Presentation by William Lamkin, Massachusetts Department of Environmental Protection] and Update on REMI Macroeconomic Analysis of IPM Scenarios [Presentation by RGGI staff]. Sessions at stakeholder meeting, November 20, 2012. Agenda retrieved from http://www.rggi.org/docs/ProgramReview/November20/12_11_20_Meeting%20Agenda%20and%20Logistics.pdf.

[53] Including ISO-NE; Natsource; Northeast States Coordinated Air Use Management (NESCAUM); NYISO; PJM Interconnection; the Pew Center; the Regulatory Assistance Project (RAP); Resources for the Future (RFF), and World Resources Institute (WRI).

[54] RGGI. Stakeholder Comments. Retrieved from http://www.rggi.org/design/program-review/stakeholder_comments

[55] Interview with Philip Cherry, director, Delaware Division of Energy and Climate, February 12, 2016.

Technical Analysis

As noted above, in order to determine possible energy, environmental and economic effects of the RGGI program, and any possible adjustments that might be considered during the review, the RGGI states engaged consultants to evaluate these affects using well-tested models. The energy model characterized the RGGI region's electricity generating system and the emissions associated with these generators. (See Figure 2).

RGGI states developed and discussed various assumptions about parameters such as future costs of fuels and their trajectories, electricity and population growth, and likely additional environmental control programs like CSAPR and MATS that might also be implemented concurrently with RGGI.

The energy model results also reported possible emissions effects that might occur outside the RGGI region. For example, generation outside the RGGI region would not be subject to a carbon price, and might enjoy a slight price advantage compared to those generators inside RGGI that are subject to RGGI requirements to purchase allowances to cover their carbon dioxide emissions. The results of the energy system model were then used as inputs to the macro-economic model to determine RGGI program effects on the region's employment, and shifts that could occur both in and outside the RGGI region.

In reviewing the record of RGGI's extensive engagement with stakeholders during the first compliance period, it is clear that the program review served a number of valuable functions and that RGGI benefitted from the periodic review. In reflecting on the value of the program review process, Bill Lamkin of the Massachusetts Department of Environmental Protection (MA DEP) observed that, in 2005, no US jurisdiction had regulated carbon across an entire sector of the economy as the RGGI states were proposing to do, and that the RGGI proposal carried with it a certain amount of uncertainty:

> This program was cutting edge, but the architects had the foresight to recognize that this [RGGI's design] could play out differently than they thought it might, and so they built into the program a way to make corrections if necessary.[56]
>
> Who would have known in 2005 that in five years there would be a nationwide recession, or that fracking technology would change the market for natural gas so significantly, pushing coal out of the market for electricity generation—both factors that, with others, significantly affected regional emissions? [57]

[56] Interview with William Lamkin, Environmental Engineer, Climate Strategies Group, Massachusetts Department of Environmental Protection, December 16, 2015.
[57] Ibid.

The Results

In 2013, on the basis of nearly three years of inquiry and engagement, the RGGI states proposed to "revise the regional cap and establish a Cost Containment Reserve."[58] RGGI's program review reinforced the knowledge that the program had excess supply of allowances by comparison to the region's actual emission levels, and that if the emissions cap were adjusted to reflect those emissions, the cost control measures that were in place would be ineffective in controlling costs. [59]

> **"The architects had the foresight to recognize that this [RGGI's design] could play out differently than they thought it might, and so they built into the program a way to make corrections if necessary."**
>
> *Bill Lamkin, Massachusetts Department of Environmental Protection*

In response, the RGGI states revised the regional cap, lowering it by 45 percent to conform with their measure of then-current regional emissions levels.[60] It was set at 91 million short tons (83 million metric tons) of CO_2 in 2014, with an agreement that each RGGI state's budget would decline 2.5 percent per year from 2015 through 2020.[61] RGGI staff also identified a large number of allowances sold at auction and held by compliance entities and investors. These allowances became referred to as the "private bank" of allowances because there were existing allowances held in private hands beyond those needed for current compliance. Given the number of allowances in circulation in the "private bank" the staff estimated the cap reductions even at 45 percent would not actually reduce emissions without further adjustments to compensate for the large "private bank" of allowances in circulation. To address this issue, the staff recommended and the commissioners agreed to make further reductions in allowances offered for auction each year.

These "interim adjustments" further reduced the number of allowances in circulation by reducing those offered for auction. So, for example, in 2015 when the RGGI adjusted cap had been lowered to 88.7 million short tons, the actual amount of allowances auctioned was adjusted downward to 66.8 million short tons meaning an amount below the cap was made available for sale. This interim adjustment mechanism is adjusted each year from 2015 to 2020 as the cap decreases to effectively reduce the private bank of emissions with interim adjustments ending in 2020.[62]

In order to address concerns that the existing cost containment mechanisms would not be up to the task of responding to possible price increases that could stem from lowering the cap, the RGGI states adopted a Cost Containment Reserve that would make available five million allowances in 2014, and ten million allowances per year each year thereafter, in cases where allowance prices exceed price thresholds, as illustrated:

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[58] RGGI. (2012). *Final Program Review Materials: Summary of Recommendations to Accompany Model Rule Amendments.*
[59] Ibid.
[60] In addition to lowering the cap, the RGGI states agreed to address the bank of unused allowances held by market participants with two interim adjustments for banked allowances from the two compliance periods.
[61] RGGI. (2012). *Final Program Review Materials: Summary of Recommendations to Accompany Model Rule Amendments.* In addition to lowering the cap, the RGGI states agreed to address the bank of unused allowances held by market participants with two interim adjustments for banked allowances from the two compliance periods
[62] Littell, D. (2016, March 24). *Aligning RGGI with Reliability and the Clean Power Plan*. Presentation at the U.S./Canada Cross-Border Summit, Building Capacity in the Face of Mounting Environmental Constraints, Boston, slide 7.

- $4 in 2014,
- $6 in 2015,
- $8 in 2016, and
- $10 in 2017.[63]

In each year after 2017, the cost containment reserve trigger price increases by 2.5%. Allowances released by this mechanism are in addition to those under the established emission cap, functionally expanding the emission cap if established price triggers are met.

Transparency

Arguably, in its simplest form, RGGI's program review is a monitoring and adjustment process that provides a vehicle for program administrators and stakeholders to assess how a program is working and consider revisions if warranted. However, on the basis of anecdotal evidence, to characterize the program review as in this narrow manner would be an incomplete characterization. According to Professor Leigh Raymond, director of the Purdue University Center for the Environment:

> If you are going to implement a policy with economy-wide implications, one that is going to affect energy prices in the face of a pressing global problem, you want to be ambitious, but you also want to give yourself every opportunity to experiment and then to learn from those experiments. So RGGI's program review is one important way to allow for that experimentation and the ability to adjust periodically based on what you have learned. [64]

The manner in which the RGGI staff conducted the review has produced additional benefits to the program. This process, according to exchanges with stakeholders and certain RGGI staff and commissioners, has created transparency. This has provided an avenue for valuable feedback to RGGI states from affected utilities and NGOs. This, in turn, has afforded RGGI states various opportunities to experiment with improvements to the program. Many have observed that the program review has also helped develop understanding and acceptance of proposed changes by affected parties and the public.

An industry stakeholder who was active in the initial RGGI program design meetings, the 2013 program review, and is now active in the 2016 review sums up his impression of program review:

> The structure of program review is a strength. There is an overall structure of engaging stakeholders, conducting analytics, sharing and developing recommendations for going forward with changes to the RGGI program. It is familiar to existing stakeholders and easy for newcomers to understand.
>
> It is great that RGGI was able to develop a regional market that has been adjusted over many years, but there is an appreciation of not wanting policy changes to shock the market or make changes that are antagonistic to the market.[65]

[63] Summary of RGGI Model Rule Changes, https://www.rggi.org/docs/ProgramReview/_FinalProgramReviewMaterials/Model_Rule_Summary.pdf.
[64] According to Professor Leigh Raymond, Director of the Purdue University Center for the Environment:
[65] Interview with Brian Jones, senior vice president, M.J. Bradley & Associates, February 8, 2016.

> **"RGGI has done an excellent job managing transparency, not just by providing a clear CO2 price signal that shows in the market, but also market monitoring reports, annual reports, getting the auction results out in a timely manner ... if you want to engage, there's more than an opportunity to do so."**

This sentiment is typical of the participants in RGGI's program review, whether from industry, government, or non-governmental organizations (NGO). This open process is both familiar to stakeholders, but also easy for newcomers, as noted above. It also provides a structure for making incremental adjustments to the program with an appreciation from the regulated community for avoiding shocks to the market.

Key RGGI state staff echoed this point. Lois New, director of the Office of Climate Change at the New York Department of Environmental Conservation (NY DEC), stated: "The RGGI program is built on stakeholder input, strong analytics, and expert advice."[66] Among the top strengths identified by RGGI state staff is the ability to move in small steps to improve upon the program, and provide the transparency and input for the RGGI states' to improve the program. [67]

Feedback

Stakeholder feedback provided in the program review was instrumental in RGGI staff decisions regarding changes to the program. While data demonstrated that RGGI had a non-binding cap (in other words, a cap far exceeding actual emissions) and needed to be adjusted to better correspond to current regional emissions and energy-demand forecasts, in the absence of a mechanism to mitigate the potential for allowance price shocks, there would not likely have been consensus among states for implementing a more binding cap. Stakeholder feedback recognized this challenge and offered solutions, favoring the adoption of a Cost Containment Reserve.[68]

RGGI Executive Director Nicole Singh and Marissa Gillet, a Maryland staff representative working on RGGI, agree that new cost containment mechanisms were added in response to stakeholder feedback.[69] In reflecting on the value of feedback in this context, one industry stakeholder said that program review provides RGGI the chance to "retune, based on circumstances." Others described it as affording an opportunity to "ground truth" and secure "quality assurance." In describing the willingness of stakeholders to provide feedback, MA DEP's Bill Lamkin observed that "folks are not shy."[70]

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[66] Interview with Lois New, director, New York Department of Environmental Conservation (DEC) Office of Climate Policy, January 4, 2016.

[67] Interviews with Marissa Gillet, senior adviser to the Maryland Public Service Commission chairman, December 22, 2015, and Lois New, NY DEC, January 4, 2016.

[68] See, e.g., comments of the American Lung Association, January 13, 2013, retrieved from http://www.rggi.org/docs/ProgramReview/StakeholderComments/January/American_Lung_Association_of_the_Northeast.pdf ; comments of M.J. Bradley & Associates, January 28, 2013, http://www.rggi.org/docs/ProgramReview/StakeholderComments/January/MJ_Bradley_and_Associates.pdf; and comments of National Grid, January 23, 2013, retrieved from http://www.rggi.org/docs/ProgramReview/StakeholderComments/January/National_Grid.pdf

[69] Interviews with Nicole Singh, RGGI Inc. executive director, December 30, 2015; and Marissa Gillet.

[70] Interview with William Lamkin.

Peter Shattuck of the Acadia Center, an environmental NGO, noted that the opportunity to provide feedback encourages "deal making" because different interest groups are in the room at the same time and reacting to each other. He added that it also requires stakeholders to justify their positions in public.[71] Dale Bryk of the Natural Resources Defense Council (NRDC) also describes the stakeholder engagement and resulting feedback as a valuable opportunity to engage with all participants:

> What is really happening is a multi-layered negotiation among stakeholders, between stakeholders and officials, and a negotiation among the officials themselves, both on behalf of the group of states and sometimes just for themselves. This was responsible for development of the infrastructure of the program that RGGI invented, including the auctioning of allowances and recognition of the value of investing revenues to reduce the cost of emission reductions by increasing energy efficiency and to speed the transition to a low carbon economy by supporting renewables.[72]

Bryk makes several points worth emphasizing. First, in a more structured setting, such as a utility commission proceeding where inquiry into issues is often formal[73] and the response of decision-makers is masked or muted, the ability to discuss the larger context with others and to engage officials at the same time is missing. Public engagement, she notes, affords the observant participant the opportunity to gauge the prospects for certain ideas and the likelihood of their adoption. This feedback occurs quickly and, in the long run, may save time and help all participants, regardless of their initial positions, to focus on solutions that appear more likely to move ahead. Additionally, it is worth noting that, as observed by NY DEC's Lois New, program review provides participants an opportunity to get clarification on "the thinking of state agency leadership."[74] In other words, in this informal setting, stakeholders are able to see how the regulators themselves are thinking about a challenge and with this opportunity, stakeholders can endeavor to be more responsive in their engagement.

Program review is valuable because the public and market participants aren't surprised by the ideas if and when they eventually end up as proposed state rules

Peter Shattuck, Acadia Center

Value of Stakeholder Engagement and Support

RGGI has a history of recognizing the value of participation and acceptance among stakeholders. This was a point made several years ago by Peter Iwanowicz, the former acting commissioner of the NY DEC, who observed that "the strong involvement of stakeholders—particularly the regulated industry—in the design and implementation of the program was critical to maintaining and sustaining support from Republicans and Democrats."[75] This view is consistent with an observation by a RGGI state staff person:

[71] Ibid.
[72] Interview with Dale Bryk, Natural Resources Defense Council, director of programs, Jan. 14, 2016.
[73] Utility commission processes, for example, may be contested and subject to the rules of evidence and civil procedure relied upon in formal courtroom proceedings. Many environmental administrative proceedings may offer no more engagement than the opportunity to make a comment in a public hearing.
[74] Interview with Lois New.
[75] Silverman, 2013.

> Any regulatory process that is amended should be transparent to stakeholder input. It is a matter of trust in the integrity of the program. When you do things behind closed doors people don't trust you anymore and they fill in the blanks.

According to Derek Furstenwerth, senior director of Environmental Services at Calpine Corp., buy-in is one of the major values he associates with the program review.[76] He emphasized that, in the RGGI program review process "people are acknowledged," and this creates a collegial atmosphere and helps stakeholders find common ground.[77]

Other interviewees agree. NRDC's Dale Bryk noted that, "If stakeholders don't understand what you are doing, and feel as though they weren't heard, then there will be more tension. But if they feel like they were heard, even if the program doesn't do exactly what they asked, the process works better."[78]

Peter Shattuck of the Acadia Center noted that it is an opportunity for the RGGI states to coordinate in public, and helps them create a sense of accountability when they consider changes to the program.[79] Another industry stakeholder indicated that the states working together publicly sends a strong and positive message.

Franz Litz, an original NY DEC staff member and principal of Litz Energy Strategies, noted:

> One of the interesting things about watching RGGI over the years, and this is partly due to program review, is that attitudes have changed and this process seems to have built what I'd call "a constituency." At the first meetings, other than enviros, no one was psyched about RGGI. They weren't nasty, but by the time the program review was nearly completed, RGGI seems to have built this constituency.
>
> It makes sense that, before the program starts there will be fears of the unknown; but once the program is running, you have the luxury of saying, "the sky didn't fall; this has been working." People gain the confidence to tinker some more and try new things like a Cost Containment Reserve. Maybe this would have happened anyway, but as a program benefits folks—or even just accommodates them in a respectful way—they become a ready group to continue the program and improve it.[80]

This process seems to have built what I'd call "a constituency."

Maybe this would have happened anyway, but as a program benefits folks—or even just accommodates them in a respectful way—they become a ready group to continue the program and improve it.

Franz Litz, Litz Energy Strategies

[76] Interview with Derek Furstenwerth, senior director of environmental services, Calpine, January 6, 2016.
[77] Ibid.
[78] Interview with Dale Bryk.
[79] Interview with Peter Shattuck, Acadia Center, February 3, 2016.
[80] Interview with Franz Litz, principal, Litz Energy Strategies.

Testing for Program Improvements

The program review represents an interesting balance: on the one hand, by supporting the process, the RGGI states get to publicly engage on the value and suitability of making certain changes to the program; on the other hand, it is an opportunity to make program adjustments without having to redesign the entire program. This provides an opportunity for program improvements to be considered before being formally proposed, and this opportunity for gradualism and incrementalism is a value that economic regulators strive to provide in rate cases and other regulated market contexts to minimize shock to the market.[81]

The Acadia Center's Peter Shattuck noted that, while this gives the RGGI states the opportunity to "float trial balloons" and new ideas like the Cost Containment Reserve, it is valuable because the public and market participants aren't surprised by the ideas if and when they eventually end up as proposed state rules. During a workshop, staff will have described them, and perhaps a specialist may provide further information on how the new idea has worked elsewhere. RGGI's Cost Containment Reserve, for example, works in many respects like the cost containment mechanism already adopted in the state of California.

Brian Jones of MJ Bradley noted that industry support for a Cost Containment Reserve was predictable:

> Offset provisions for cost containment came from outside. Industry wanted them there even though this was a big lift for the states to take on to develop the learning curve and protocols. Multi-year compliance periods and banking came from industry. They were natural follow-ons to implementation of the NO_x SIP [State Implementation Plan] Call[82] that made banking familiar and appreciation of the flexibility banking provides to companies.[83]

According to Jared Snyder, deputy commissioner for Air Resources, Climate Change, and Energy at NY DEC, the program review:

> … provides the opportunity to see what's been working, and it can show where maybe something hasn't worked the way we had anticipated, and where some changes could be required. It recognizes that we have the ability to learn from what we are doing and improve the program over time based on what we've learned. [84]

Lowering the emissions cap was one of the ideas raised by the program review. However, stakeholder willingness to lower the cap depended on the acceptability of a cost containment mechanism to stakeholders.

> **Program review "recognizes that we have the ability to learn from what we are doing and improve the program over time based on what we've learned."**
>
> *Jared Snyder, New York Department of Environmental Conservation*

[81] Interview with Marissa Gillet.
[82] The NOx SIP Call Rule (63 FR 57356, October 27, 1998 and 69 FR 21604, April 21, 2004), a market-based program, addressed the interstate transport of ozone, and required twenty-one States and the District of Columbia to eliminate those amounts of NOx emissions that contribute significantly to downwind nonattainment of the 1-hour ozone standard. "Q&As for Phase II of the NOx SIP Call," https://www3.epa.gov/ttn/caaa/t1/reports/23814qnaasfin.pdf.
[83] Interview with Brian Jones.
[84] Interview with Jared Snyder, NY DEC, assistant commissioner for air resources, climate change, and energy, January 15, 2016.

Part III: Observations for States

Policy design, implementation, and operation can be improved with the ability to make adjustments while a program is underway. Building a review process into a complex energy and environmental program like RGGI allows for the opportunity to experiment, to learn from successes and challenges, and then, where necessary to periodically make program modifications openly and deliberately. Not only has RGGI's comprehensive program review process demonstrated its capacity to address complex and interrelated issues like cap level and cost containment, it also has shown that, overall, the program itself operates as planned or better, and needs no adjustment.

Regulators can draw some of the following lessons from program review.

The Value in Recognizing and Addressing Uncertainty

Despite an inability to determine what the future may hold, policymakers using market-based models can develop ways of ensuring positive outcomes for the programs they design. In the face of this uncertainty, RGGI's program review is one way to allow for that. The adoption of an open and collaborative approach with experts and various stakeholders, according to an established schedule can help to ensure a transparent and accommodating process. As noted by RGGI Inc.'s former Executive Director, Nicole Singh, this approach offers a "structured, periodic process to change the program while allowing for change that is not disruptive to participants."[85]

Program Review or Mere Monitoring?

Due at least in part to the initial RGGI program design being new and untested, the RGGI states chose to conduct a rigorous level of analysis and sponsor extensive stakeholder engagement, including a process for engaging regulators, stakeholders, and other experts in a comprehensive review. This level of scrutiny, especially during early implementation years, can be a significant risk mitigation tool.

Likewise, the degree of engagement is credited with creating a positive and collegial atmosphere that is respectful of differing views, producing transparency and leading to valuable feedback that in turn can lead to program improvements and broader participant buy-in. RGGI's program review is credited not only with highlighting challenges associated with lowering the cap, but also with developing the general recognition of the need for some kind of cost containment mechanism that would address concerns for high costs and enable consensus among states to lower the cap.

Educate Affected Parties

A CO_2 program for the power sector is likely to be far-reaching, affecting state economies, environmental and energy regulatory agencies, and a broad range of stakeholders with whom regulators typically work. During RGGI's early planning years, the RGGI staff engaged subject matter experts, and arranged numerous topical workshops to educate themselves and others about various aspects of the program they were developing.

[85] Interview with Nicole Singh.

These initial efforts formed the framework for the later program review engagement and education, as embodied in RGGI's "Draft Outline of Stakeholder Process:"

1. Inform the public and stakeholders about their "deliberations, and draft and final work products;"
2. Provide themselves with early input on their ideas and draft work;
3. Maintain a dialogue with stakeholders; and
4. Establish a means for the public and stakeholders to submit formal comments to the RGGI staff at key decision points in the RGGI process.

As state regulators developing market-based programs consider how best to engage with the public and educate them about the key issues that may arise from their planning work, the initial education efforts of the RGGI staff provide a valuable model for states to consider and use as a starting point.

Scope of Review

The RGGI states agreed in the 2005 MOU to conduct a review in 2012 of all components of the program, including but not limited to:

1. Program Success;
2. Program Impacts;
3. Additional Reductions;
4. Imports and Emissions Leakage; and
5. Offsets.

While the scope of the program review established in the MOU is ambitious, the RGGI states were able to manage this effort. As described, they first focused broadly across the entire program, but ultimately concentrated on several major issues related to the program cap and a mechanism for cost containment. Starting broadly allowed the states to vet a number of issues that may initially have appeared significant, but which the states concluded did not need to be addressed.

State officials reticent about a program review that focuses broadly on all program elements should remember that, while the RGGI states started with a broad mandate, the inquiry narrowed down to issues that state officials and stakeholders agreed were the key issues in need of attention. State regulators that initially adopt a broad and inclusive approach with various stakeholders should be able to take comment, prioritize, and manage the dialogue with stakeholders in a public and transparent manner to identify those issues that are in need of being addressed.

Level of Effort

RGGI's first program review was a labor-intensive engagement extending over 2 ½ years, involving state staff and commissioners from several agencies, consultants, and stakeholders. As noted in the scope of review section above. There is no magic formula for the right amount of time to conduct a review. While the general assessment is that the effort was a success, it may be that a shorter amount of time for the inquiry or more limited level of effort could produce acceptable result

Conclusions

Experience with RGGI's program review mechanism illustrates the importance of including a comprehensive review mechanism to assess program functionality to ensure the economic, environmental, and equitable performance of the program. The adoption of an open and collaborative planning framework with various stakeholders can help to develop a transparent process for accommodating and reacting to changing circumstances. Jurisdictions engaged in the development of market-based programs could benefit from lessons learned by RGGI states and stakeholders. For jurisdictions that are designing plans to reduce GHG emissions, an appreciation of the benefits and challenges associated with a built-in review process could afford them an opportunity to accommodate some of the uncertainty inherent in regulatory systems and to make valuable adjustments to those plans when necessary.