RGGI and CO_2 Emissions Trading Under the Clean Power Plan:

Options for Trading Among Generating Units in RGGI and Other States

Executive Summary

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Overview

The RGGI states have over seven years of experience running a voluntary multi-state program to limit emissions of CO_2 through a mass-based, allowance trading program. The states have administered a liquid and efficient market for trading emission allowances and have directed the proceeds from allowance auctions to achieve economic benefits and meet the public policy objectives important to each individual state.

Now, in the second major phase of RGGI program review, the RGGI states are considering program changes in the emerging national context for CO_2 control under the EPA's Clean Power Plan. The latter introduces the potential for the development of a much broader market for the trading of CO_2 allowances in response to EPA requirements. In this context, the RGGI states have a unique opportunity to shed light on the function and benefits of mass-based CO_2 allowance trading and to open the door to expanded trading opportunities for power plants located inside and outside the RGGI states.

We believe it is timely for the RGGI states to consider issues that could facilitate the creation of a broad market for the trading of CO_2 emission allowances and to help establish a framework for efficient, low-cost achievement of EPA's CO_2 emission reduction mandate. In this report, we assess the core issues around emission-allowance trading that RGGI states could consider during the current program review and identify principles and objectives for program design changes that RGGI states might incorporate given the emerging national context.

Executive Summary

Background: RGGI and the Clean Power Plan Context

The Regional Greenhouse Gas Initiative ("RGGI") is the first mandatory carbon-dioxide ("CO_2") emission-allowance trading market affecting fossil-fuel power plants in the U.S. and has been in operation since 2009. Under RGGI, total CO_2 emissions from fossil-fuel fired power plants across the nine-state region may not exceed an amount of emissions (called the RGGI program budget). That emissions budget amounted to 91 million short tons of CO_2 in 2014 and declines by 2.5 percent annually through 2020. The RGGI program was built on voluntary commitments and mutual cooperation by the RGGI states to limit CO_2 emissions from the electric sector across the Northeast region through an efficient emission-allowance trading program.

The RGGI states periodically conduct a program-design review process. They completed a comprehensive review in 2012, and the 2016 review process is currently underway. Program reviews include a full evaluation of the program through stakeholder input, analysis, and RGGI state deliberations. In the past, the review process has led to major changes in the RGGI program reflecting the region's changing understanding of the climate challenge and the changing industry and regulatory landscape in which power plants operate.

The current RGGI program review takes place in an important context – namely, states' planning for controlling power plant CO_2 emissions in the future in a way that will allow for compliance with the Environmental Protection Agency's ("EPA") Clean Power Plan ("CPP"). Presuming the CPP goes forward after review by the federal courts, it will be the first mandatory national program to regulate emissions of CO_2 from existing power plants. The many states with power plants covered by the CPP – including eight of the nine RGGI states – will need to have a compliance strategy under the CPP beginning in 2022.

This heightens the importance of the current RGGI program review, which is aimed at identifying any changes in RGGI for the post-2020 period – a timeframe that overlaps with state plan development and implementation periods for the CPP. Generating units covered under RGGI are, for the most part, the same power plants covered by the CPP. The RGGI states may wish to incorporate a CPP lens into their current assessment of the need for and value of changes to RGGI in the post 2020 period. Clarifying the alignment of the two programs will undoubtedly provide a critical measure of stability, predictability and efficiency in the investment decisions affecting the region's power sector, in government administration, and in minimization of the overall cost of environmental compliance paid for by electricity consumers in the nine-state RGGI region.

This current RGGI review is also timely for considering the possibility of expanded trading of CO_2 allowances under the CPP and the role that RGGI's experience could play in facilitating a broader trading market. EPA has shaped the CPP in ways that create the opportunity for states and their fossil-fuel power plants to participate in multi-state trading plans, whether by agreement among the states, by adoption of state plans with compatible trading platforms, or by selection of the trading-ready elements of EPA's model rule. It is widely accepted that expanding the universe of affected sources within an air-emission trading program lowers the collective cost of meeting emission performance standards and improves the efficiency of compliance outcomes.

Both RGGI states and other states thus have an interest in the policies the RGGI states will adopt in this current program review. Given their seven-plus years of experience and a body of assessments of how RGGI has performed, the RGGI states' perspective on the CPP is important. RGGI has the opportunity to establish a path forward for states seeking to capitalize on the benefits of a broader geographical footprint for meeting their own compliance obligations.

Purpose and Focus of the Report

In this report, we investigate key questions being addressed by RGGI states in the current program review. We focus on (1) how to harmonize the region's ongoing trading program with EPA compliance requirements, and (2) how to create an open architecture for expanding the trading opportunities for power plants located inside and outside the Northeast. Although we recognize that these are not the only questions that RGGI faces in this review process, our focus on these issues reflects our view that proactive and timely attention to these questions may help the RGGI states and other states achieve better CO_2 emission-control programs in the CPP context.

For the purposes of this report, we presume that the CPP will eventually move forward in largely the same form as is set forth in EPA's final regulations published in the Federal Register in October 2015. We also assume that RGGI remains a functioning program going forward, and that current RGGI states may use it as a framework for developing CPP-compliant state plans and for achieving compliance starting in 2022.

Our report has several parts. First, we analyze technical or threshold issues that RGGI states need to address so that RGGI's framework is capable of complying with the CPP. Second, we present key principles to guide RGGI states' consideration of program elements most important to facilitating effective and efficient trading between RGGI and non-RGGI states. Third, we review a host of "second tier" issues that may be of interest to various RGGI states and stakeholders but that are less critical specifically from a trading point of view. With this

approach, we hope to shine a brighter light on the key topics that could enable broader allowance trading.

Observations

We describe issues that are closely tied to enabling broad trading and that are important to consider in the current regulatory context. These are described throughout the report and summarized in Table ES-1. Based on our review of these issues, we make the following observations:

We encourage the current RGGI deliberations to focus on what matters: the long-run efficiencies and cost savings that result from participating in a broad, regional allowance-trading market

Achieving power-plant emission-control objectives through a multi-state, mass-based emission control program that permits power plant owners to trade emission allowances provides low-cost compliance. It helps to send appropriate signals for investment in and operation of power system infrastructure and achieves social objectives in the most economically efficient manner. This has been demonstrated time and again through national programs such as the Title IV SO_2 allowance trading program as well as state and regional programs (like RGGI). This tradeable-allowance structure operates well in both regulated and competitive electric-industry contexts and integrates seamlessly with electricity market operations. A broader market with more participants creates the opportunity to lower overall costs of compliance.

We encourage the RGGI states to not lose sight of these higher-level objectives and benefits of broad allowance-trading markets during this period of transition. A focus on these objectives is important as the nation moves towards a national program of CO_2 emission performance standards for existing power plants and as states decide which compliance paths to select (e.g., mass-based or rate-based, single-state-only or multi-state approaches).

In the long run, RGGI states will benefit from the broadest possible system of allowance trading across the U.S.

The CPP includes national performance standards for existing power plants, but provides states significant flexibility in their implementation plans to meet their state-specific targets. It is easy in this context for each state to focus on what appears to be the best short-term compliance path assuming current market conditions, rather than what is most likely to be the best long-term strategy for CPP compliance. A broad and liquid market for allowance trading under a mass-based program that covers the widest geographic scope has been shown time and again to be the least-cost path to compliance. We encourage RGGI states to recognize that their best interest

lies in maximizing the number of states with power plants eligible to trade with RGGI generators.

We encourage RGGI states to focus some attention outward in the current program review, in addition to considering near-term and state priorities

The CPP state plan and power-plant compliance deadlines extend over many years, and the ultimate deadlines and compliance obligations remain the focus of litigation. Nonetheless, many states are actively considering compliance options, trying to understand the relative costs and benefits of different approaches, evaluating whether to adopt a mass-based trading program, and assessing the steps they might need to take to enable the power plants in their states to trade with those in RGGI states and/or other states. The RGGI states are uniquely positioned to demonstrate the successful history of workable, multi-state CO_2 allowance-trading regimes and to take the lead on adapting the RGGI program structure to stand out as a CPP compliance-ready program design and allowance-trading platform. We encourage the RGGI states to make the most of this opportunity to identify, consider and embrace RGGI program design changes that would create an open trading architecture with which other states could align their own plans (without necessarily 'joining' RGGI *per se*).

RGGI states will need to address several technical program issues to enable RGGI to align with Clean Power Plan requirements

The CPP allows states to exercise discretion among many options for state plan elements, including between rate- or mass-based approaches, whether and if so how to enable multi-state compliance, and so forth. The CPP framework specifically leaves the door open for the RGGI states to design compliance around continuation of the existing RGGI framework and for other states to join RGGI or to otherwise enable their power plants to trade emission allowances with those in the RGGI region. RGGI's current program details, however, are not fully consistent with all CPP requirements, in part because the CPP had to be designed within the structure and requirements of the Clean Air Act ("CAA"). In contrast, RGGI was designed based on voluntary and cooperative deliberation among member states and was not restricted in any way by the CAA itself. As a result, there are several "technical" or "threshold" elements that need to be addressed if the RGGI states want to use RGGI for compliance with the CPP (not taking into account other changes RGGI states might want to adopt in order to expand the geographic boundaries of trading for RGGI generators). These major threshold issues include:

- **Source Definition and Program Budget(s)** – RGGI now applies to all fossil-fueled power plants (existing and new) with capacity of at least 25 Megawatts ("MW"). The

CPP does not apply to a subset of these fossil-fuel power plants (i.e., combustion turbines). RGGI's emission budget covers existing and new fossil plants as they enter service, while the CPP only directly covers existing plants (leaving states an *option* to include new sources in a mass-based state plan). RGGI will need to address whether and how to continue to include sources not meeting the EPA definition of affected units within the RGGI framework. Such issues will need to be addressed by RGGI and individual RGGI states in order for the program to align with the CPP.

- **Allowance Value** – Like RGGI, the CPP requires that an allowance in a mass-based program be equivalent to one short ton of CO_2. The RGGI states will need to demonstrate, however, that the future design of the RGGI program associated state plans will lead to a CO_2 allowance equivalent to a CO_2 allowance under the CPP.
- **Term** – The CPP requires that state plans establish provisions to reduce emissions during interim periods and up through 2030. RGGI exists as a voluntary program currently extending only through 2020. The RGGI states will need to address how they envision continuation of the RGGI program for the full term of CPP compliance. If the RGGI program does not address CPP compliance through 2030, RGGI states will need to identify how CPP compliance will be met through 2030.
- **Offsets and Banking** – RGGI allows for the limited application of emission offsets for compliance, but a mass-based plan under the CPP may not rely on offsets. RGGI states may need to eliminate the applicability of offsets for compliance starting in 2022. Both the CPP and RGGI allow for unlimited banking of allowances, for use in future years, though RGGI states may need to resolve the disposition of pre-2022 RGGI allowances in 2022 and beyond.
- **Emission and Allowance Tracking System** – RGGI must conform its current CO_2 Allowance Tracking System ("COATS"), or adopt an EPA-administered (or other approved) tracking system for allowance trading starting in 2022.

Beyond threshold technical elements, RGGI states should address several "first tier" considerations to facilitate a broad geographic market for allowance trading

It would be natural for RGGI states and stakeholders to focus their attention in the current program review on the RGGI program itself and on the same core issues that have been addressed in prior program reviews. However, it would be a missed opportunity if the current program review did not actively consider and resolve what changes might be needed to facilitate expanded emission trading in a broader geographic region under the CPP. We encourage this to be a primary goal in this program review.

In this context, it is important for the RGGI states to consider several fundamental issues now rather than waiting until a subsequent program review and to send a clear message to states

and stakeholders within and outside of RGGI about the desire to find ways to align trading options for mutual benefit in the years ahead. Some of these foundational issues may present tradeoffs with RGGI states' traditional goals and objectives. To sharpen their focus, RGGI states might pose the following standard question with respect to any structural element of the RGGI program and any potential condition being contemplated for interstate trading: would this element (or condition) facilitate emission-trading between generators inside and outside of RGGI? If so, are the benefits associated with incorporating this element (or condition) worth the potential drawbacks to including it from the perspective of the RGGI states?

Key issues in this context include the following:

- **Auction Revenues to RGGI States** – Studies have conclusively demonstrated the substantial economic and policy benefits to the RGGI states of (1) disbursing nearly all allowances into the market through a central auction mechanism, (2) returning auction revenues to the RGGI states, and (3) using those revenues in various ways to further greenhouse gas ("GHG") reduction goals, address electricity cost concerns, and meet other economic and energy policy objectives (such renewable energy and energy efficiency investments). Expanding the allowance trading platform to include other states will almost certainly affect the initial level of auction proceeds to the RGGI states. This could result from changes in the value of allowances. Expanding the compliance footprint may lower the marginal cost of CO_2 control and thus lower the clearing prices for allowances in RGGI's auction. Such a change could result from the ability of generators in RGGI states being able to obtain allowances in other states that do not have a floor price on allowances. Without reliable forecasts of these and other potential impacts on RGGI allowance auction proceeds over time, the RGGI states will need to explicitly recognize this potential impact and weigh the potential risk of dampened allowance proceeds against the longer-run benefits of a broader allowance trading footprint.
- **Allowance Distribution** – In theory, the RGGI states could seek to require that allowances used for compliance in the RGGI states be distributed initially into the market through a single- or multi-state auction mechanism. We recommend against such a requirement because the manner in which allowances move into the market – whether they are auctioned or, for example, given away for free – affects neither the cost of allowances in power production nor the ultimate level of reduction in CO_2 emissions. Even in the RGGI states where the auction is the main means of moving allowances into the market in the first instance, RGGI allowances now trade in the secondary market, at prices buyers and sellers of allowances are willing to pay at any point in time. The

ultimate price of all allowances is driven by the marginal cost to meet the aggregate mass-based limit on affected sources across the trading region, which is not affected by the party that captures the value of allowances through initial distribution. We do not think that the efficiency gains of supporting trading among electric generating units ("EGUs") in a broader region will be undermined by these differences in allowance-allocation mechanisms or industry structure. In fact, RGGI's current agreements allow each state to decide who gets the value of the CO_2 allowance currency, and we encourage the RGGI states to continue this fundamental element of the program design.

- **Market Monitoring** – RGGI's auctions are conducted with the oversight of a market monitor, who has provided a body of evaluations and assessments that have enabled the RGGI states to have confidence in the prices and allowance-disbursement outcomes resulting from the allowance auctions. Effective market monitoring has given RGGI states comfort about underlying market-power considerations in the central market for allowances. The market monitoring structure in RGGI was established due to concerns over hoarding of allowances and other potential forms of market manipulation that could affect compliance opportunities and cost, as well as the competitiveness and efficiency of the allowance trading system. With the potential expansion of allowance trading across many states with different combinations of auctions, allocations, and trading rules, RGGI may want to ensure that any allowances used for compliance in RGGI states be subject to the same or similar monitoring requirements (especially in the secondary market).

The RGGI states will need to consider a number of "second tier" aspects of allowance trading programs that, while important, are not explicitly relevant to trading with other states

There are a number of "second tier" policy issues that the RGGI states are considering that could have an impact on RGGI allowance prices and revenues, but that – in our view – do not represent key decision points affecting the ability of sources inside and outside RGGI to engage in trading. For example, the RGGI states may individually or collectively adopt a more stringent cap for the RGGI states. RGGI may conform state budgets to CPP levels, maintain the cap trajectory as it now stands, or increasing the stringency of power-sector CO_2 reduction requirements in RGGI states going forward. Different cap levels in the RGGI states could have an impact on the price and value of allowances as well as on overall levels of CO_2 emissions in RGGI (and in the U.S.), depending on how the associated allowances are disbursed, set aside, or retired by the RGGI states. But this issue need not be central to a program design aimed at facilitating broad trading. We encourage the RGGI states to consider in this review period the potential implications of continuing the RGGI program at various cap levels relative to state CPP requirements.

Table ES-1: Summary of RGGI-CPP Trading-Related Issues

Threshold Issue	Description	Key Considerations
Trading Perspective	RGGI faces a number of design decisions which, in the CPP context, may affect RGGI states' ability or desire to trade with other states.	Increasing trading lowers compliance costs for all, enabling more cost-effective and/or deeper CO_2 emission reductions over time. RGGI should consider – and we hope pursue – an architecture for trading that is as broad possible in order to lower the cost of compliance with CO_2 emission reduction.
Compliance Approach	Individual RGGI states will need to adopt a particular state plan for CPP compliance.	Assuming a mass-based approach, RGGI states will need to decide whether to select a performance-standard or state-measures approach.
Compliance Timing	If RGGI states want to use RGGI as the foundation of their state plans for the CPP, they will need to align compliance timing.	CPP requires state plans through 2030; RGGI has a shorter timeframe. RGGI states will need to address this discontinuity.
Affected Sources	EPA CPP does not cover CO_2 emissions from combustion turbines ("CTs"); RGGI does.	RGGI state plans could retain coverage of CTs, by including them within the state budgets as a matter of state policy and within CPP budgets (which has the effect of lowering the amount useable by EGUs under federally enforceable limits) or by adopting a state measures approach.
New Units	RGGI includes new units; CPP does not require (but allows) inclusion of new units.	RGGI states will have to address leakage of CO_2 from existing units to new units if new units are not retained in RGGI program (or in the plans of states seeking trading with RGGI generating units).
Offsets	CPP does not allow offsets in state Performance Standard plans.	RGGI could retain the use of offsets through a state measures approach that ensures CPP EGU budget integrity.
Banking	RGGI and CPP allow banking of allowances.	RGGI states should clarify treatment of pre-2022 banked RGGI allowances during a post-2022 CPP compliance period.
Emission/ Allowance Tracking System	CPP requires EPA approval of an emission/allowance tracking system.	EPA approval of RGGI COATS or a similar tracking system would enable trading with other states that use an EPA-approved state plan and EPA-administered or approved tracking system.
Minimum Allowance Price	CPP does not include or require minimum prices for allowances.	RGGI's minimum price provides revenue certainty but may restrict trading or lead to inefficient allowance purchase incentives.
Allowance Distribution	Neither RGGI nor the CPP dictate how allowances are initially distributed, though in practice, nearly all RGGI allowances are auctioned.	The objective of enabling a broad allowance-trading market would caution against RGGI conditioning trading upon allowance distribution requirements.
Market Monitoring	The CPP contains no market monitoring requirements.	RGGI's market monitoring provides important certainty for RGGI states; RGGI may want to consider linking trading to market oversight in partner states.