# Multi-State Responses to GHG Regulation Under Section 111(d) of the Clean Air Act

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MJB&A

## Foreword

In October 2013, M.J. Bradley & Associates (MJB&A) released a report that explored options for the design of carbon pollution standards for existing fossil fuel power plants. This second report, released on behalf of the Clean Energy Group's (CEG's) Clean Air Policy Initiative member companies, examines the benefits of multi-state responses to EPA's anticipated greenhouse gas performance standards under section 111(d) of the Clean Air Act.

CEG's Clean Air Policy Initiative member companies support the need to reduce the industry's carbon emissions and believe that the right policies can deliver meaningful emissions reductions while ensuring affordable and reliable power supplies to meet our nation's energy needs. We continue to urge EPA and states to adopt market-based regulatory approaches that encourage companies to find cost-effective compliance solutions, and multi-state compliance plans may offer states the opportunity to capture the lowest-cost reduction opportunities among multiple states while still achieving the same environmental benefits.

As EPA designs the federal program under 111(d) and as states consider compliance and coordination with other states, it will be important to avoid creating market distortions that would reduce the cost effectiveness and environmental benefit of the program. Multi-state compliance plans have the potential to mitigate some of the interstate dynamics and market inefficiencies that could result if states take different regulatory approaches under section 111(d). Coordinating compliance plans can help minimize the resulting economic distortions that will interfere with clear and consistent price signals necessary to drive cost-effective compliance solutions.

As EPA looks to release the proposal under section 111(d) this June, states and stakeholders will be evaluating the various compliance options, and this report is aimed at outlining some of the considerations that will be part of that process. We look forward to continued engagement with EPA and other stakeholders on the development of the carbon pollution rules.

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## Acknowledgements

The following report was prepared on behalf of the following electric companies dedicated to responsible energy and environmental stewardship. The participating companies (listed below) are some of the nation's largest generators of electricity, with over 146,000 megawatts of electric generating capacity (including 93,000 megawatts of fossil generating capacity) throughout the U.S.

Austin Energy
Calpine Corporation
Exelon Corporation
Los Angeles Department of Water & Power
National Grid
New York Power Authority
NextEra Energy
Public Service Enterprise Group, Inc.
Seattle City Light

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## Introduction

In October 2013, M.J. Bradley & Associates (MJB&A) released a report that provides background on the Clean Air Act ("CAA" or "the Act") requirements for the regulation of greenhouse gas (GHG) emissions for power plants.[1] Section 111 of the Act directs EPA to establish emissions standards for stationary sources of air pollution that "may reasonably be anticipated to endanger public health or welfare," including GHG emissions. The October MJB&A report examines the potential form of the standard for existing sources, highlighting the advantages and disadvantages of different approaches from various stakeholder perspectives. In exploring the options, the report notes that flexible, market-based regulatory approaches can be designed to encourage companies to find cost-effective compliance solutions, while recognizing early investments to reduce emissions.

Since MJB&A released the report, EPA has hosted a series of public hearings and participated in a range of workshops on how to regulate existing power plants under section 111(d). Through significant stakeholder outreach with states, industry, and others, EPA has indicated in its public presentations that it has heard a range of compliance options—many of which are consistent with the three discussed in the MJB&A report:

(1) Plant-specific carbon dioxide ($CO_2$) emissions standards (lb/MWh) or heat rate standards (Btu/kwh) (referred to in the report as a performance standard with limited or no flexibility);
(2) $CO_2$ emissions standards with the option of banking, averaging, and trading (performance standard with flexibility); or
(3) State budget approach with banking and trading.

Another topic that has been raised at public hearings and in a number of stakeholder comments is the option of allowing states to work together to develop multi-state compliance approaches. This discussion paper explores multi-state responses to section 111(d) regulation, including why states may want to consider adopting multi-state compliance programs and how multi-state compliance could work under section 111(d) of the CAA.

[1] Chris Van Atten (MJB&A), Structuring Power Plant Emissions Standards Under Section 111(d) of the Clean Air Act – Standards for Existing Plants, October 2013. Available at: http://www.mjbradley.com/node/237.

## Potential Benefits of Multi-State Compliance

There is a long tradition of multi-state compliance approaches that have successfully reduced air emissions under the CAA. As highlighted throughout this section, successful programs include the Ozone Transport Region trading program for nitrogen oxides ($NO_x$), the $NO_x$ Budget Trading Program under the $NO_x$ SIP call, the Clean Air Interstate Rule (CAIR), the Regional Haze Program, and the Acid Rain Program (which was created by legislation) for sulfur dioxide ($SO_2$) and $NO_x$. $CO_2$, an air pollutant with global impacts, is particularly well suited for regulation under a broad regional or multi-state trading system—whether it be a region of contiguous or non-contiguous states. Unlike other air emissions, such as hazardous air pollutants, $CO_2$ does not have localized effects.

There are several reasons why stakeholders might support states' developing joint compliance programs to address $CO_2$ emissions from power plants. First, by expanding the number of potential reduction opportunities, a multi-state compliance program could reduce the overall costs of the program by facilitating capture of the most cost-effective emission reductions. The Midcontinent Independent System Operator (MISO), the electric system operator in the central U.S., conducted a preliminary analysis that concluded that a regional approach would save the region $3 to $5 billion annually, or $30-$50 billion over 20 years (net present value) compared to an

### *$NO_x$ SIP Call and NOx Budget Program (2003-2008)*

Under the $NO_x$ SIP Call, EPA required 20 upwind states and the District of Columbia to reduce $NO_x$ emissions to address summertime ozone levels in downwind states. A central component of the $NO_x$ SIP Call was the establishment of the $NO_x$ Budget Trading Program (NBP) as an alternative to individual state action. All states chose to participate in the NBP. To determine the required emission reductions, EPA conducted a technical analysis of the levels of $NO_x$ reductions that could be obtained based on cost-effective and available pollution control technologies. Using that analysis, EPA assigned each state a corresponding budget and allowed states the option of participating in a cap-and-trade system to meet its budget. Budgets were based on the higher of the 1995 or 1996 ozone season heat input valuates. The regional budget, therefore, was the sum of all the participating states' budgets. Thus, while some states could have had emissions that exceeded their budgets, other states with lower emissions would keep the entire region below the cap. Additionally, through a compliance supplement pool of allowances, EPA offered states a pathway to credit some early reductions achieved prior to the compliance date. The NBP was preceded by the Ozone Transport Commission's two phases of $NO_x$ reduction programs from 1995 to 2002, including an ozone season cap-and-trade program for the smaller Ozone Transport Region (OTR). The Clean Air Interstate Rule (CAIR) superseded the NBP in 2009.

approach based on MISO Local Resource Zones, which align closely to the state borders.[2] Additionally, numerous economic studies have shown that broad trading systems can produce significant cost savings.[3]

Electric generators that operate in multiple states may be able to reduce compliance costs within their own operations by taking advantage of the lowest-cost reduction opportunities across their generating fleet. A company that operates in three states may have few opportunities to reduce $CO_2$ emissions within one particular state, but more cost-effective reduction opportunities in the two other states. A multi-state program would allow the company to take advantage of the lowest-cost reduction opportunities across all three states. If the states jointly offered incentives to pursue the most cost-effective emission reductions, they would minimize overall costs without jeopardizing the environmental outcomes. Officials at the Regional Greenhouse Gas Initiative (RGGI) have noted that its multi-state focus helps to ensure that the most cost-effective emission reductions occur. As an example, Rhode Island's $CO_2$ emissions have actually increased since the start of the program because the state's natural gas-fired power plants have displaced higher-emitting generation in other states.[4] This shift has helped minimize costs while enabling the region to

***Clean Air Interstate Rule (CAIR)***

On March 10, 2005, EPA promulgated CAIR for the eastern part of the U.S. EPA designed CAIR to build on the success of the trading program under the $NO_x$ SIP Call. Unlike the NBP, CAIR targets the precursors to $PM_{2.5}$ formation as well as ozone to facilitate attainment with both NAAQS. CAIR used the Federal Implementation Plan (FIP) process under CAA Section 110 to create three separate trading programs: annual $NO_x$, ozone season $NO_x$, and annual $SO_2$ program. However, the program created only two new allowance currencies for $NO_x$ and relied on Acid Rain Program allowances for the $SO_2$ program. In 2008, the D.C. Circuit remanded CAIR on several grounds, one of them being the alteration of the ARP surrender ratio. Although EPA is working to respond to the court's decision as well as the subsequent decision on the Cross State Air Pollution Rule, the CAIR program remains an example of a multi-state approach to addressing a regional air quality issue.

[2] MISO, *Refresh of MTEP-10 Carbon Analysis*, February 19, 2014. Available at: https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140219/20140219%20PAC%20Item%2003%20Refresh%20of%20MTEP10%20Carbon%20Analysis.pdf

[3] See, e.g., Tietenberg, T. H., *Economic instruments for Environmental Regulation*, Oxford Review of Economic Policy, 6:17-33 (1990).

[4] RGGI, *Report on Emission Reduction Efforts of the States Participating in the Regional Greenhouse Gas Initiative and Recommendations for Guidelines under Section 111(d) of the Clean Air Act*, December 2, 2013. Available at: http://www.rggi.org/docs/RGGI_States_111d_Letter_Comments.pdf.

meet its $CO_2$ reduction targets.

In addition to greater opportunity to capture the lowest-cost reduction opportunities, a multi-state compliance program also provides greater flexibility to the electric system as it responds to companies' compliance decisions under section 111(d). If the program encompasses a broader geographic region, electric system operators will benefit as they manage the flow of electricity across state lines and match supply to demand. For example, the outage of a large nuclear plant could force increased reliance on fossil-generating facilities, increasing $CO_2$ emissions in a state. A flexible compliance approach that involves multiple states would allow for greater emissions in that state, while providing the flexibility to allow each state in the multi-state plan to cost-effectively meet their compliance obligation under section 111(d) through averaging or the trading of credits.

***Regional Haze Program: Market-Based Backstop***

EPA's 1999 Regional Haze Rule (RHR) under CAA Sections 169A, 169B, and 110 allows states to adopt an alternative program in place of source-specific BART as long as similar visibility improvements result by 2018, the end of the first control period. As an alternative to BART for the covered western states, the RHR specifically included a market-based program that set periodic reduction goals for $SO_2$ emissions and, if they were not met, trigger a "backstop" market-based program (i.e., a tonnage fee). Several petitioners argued that the CAA requires states to impose source-specific controls and does not authorize a trading program. However, the D.C. Circuit agreed with EPA that the Act allowed the backstop market-trading program. EPA is currently in the process of approving SIPs incorporating the backstop plan for New Mexico, Wyoming, and Utah. Some have objected to EPA's approval of the more limited trading program just for these states, but EPA noted in approving the Utah SIP that "there is no reason to believe that the limited participation … will limit the effectiveness of the program in the three States".

Source: Approval, Disapproval and Promulgation of State Implementation Plans; State of Utah; Regional Haze Rule Requirements for Mandatory Class I Areas Under 40 CFR 51.309, 77 FR 74,358 (December 14, 2012).

Second, a multi-state compliance program may reduce the market distortions that could result from a patchwork of individual state programs. Although section 111(d) contemplates state-based implementation and compliance, the electric system and electricity markets operate across state borders. In response to new carbon emission standards, it may be more cost-effective to reduce generation from a power plant in one state, and increase generation from a more efficient plant in another state. However, a patchwork regulatory approach could create perverse incentives that prevent this sort of multi-state balancing, thereby increasing the costs

to the electric system and consumers without any greater environmental benefit. This is true for all states but especially true for states within the same Independent System Operator or Regional Transmission Organization (ISO/RTO) region.

To explore this issue further, consider an example in which State A in the PJM Interconnection (PJM) implements a $CO_2$ performance standard with banking, averaging, and trading while a neighboring state in PJM, State B, elects to adopt a state budget approach. Two otherwise identical plants operating in the two states would face very different economic signals, and may offer different bids because of their different compliance obligations. The generator operating below the performance standard in State A would earn credits for every unit of electricity produced below the standard and may reduce its bid accordingly, which may result in market distortions and higher emissions if units in State A absorb any demand increases and potentially displace lower emitting units in State B.

***Acid Rain Program***

Congress established the Acid Rain Program in the CAA Amendments of 1990. The program requires sulfur dioxide ($SO_2$) and nitrogen oxides ($NO_x$) emission reductions from power plants throughout the U.S. The $SO_2$ program capped $SO_2$ emissions from power plants, and $NO_x$ emissions were subject to emission rate standards. EPA has explained that the Acid Rain Program "was the first large-scale cap and trade program in the world and has been successful in reducing these pollutants, despite large increases in electricity generation." From 1995 to 2009, power plants reduced annual $SO_2$ emissions by 64 percent compared to 1990 levels. From 1995 to 2009, annual $NO_x$ emissions from power plants under the program decreased by 67 percent (other programs contributed to $NO_x$ reductions from power plants, including the OTC $NO_x$ Budget Program (1999-2002) and the $NO_x$ Budget Trading Program (2003-2008) discussed above).

Source: EPA, Acid Rain Program 2009 Progress Reports (December 2010) Available at: http://www.epa.gov/air/caa/pdfs/CAA_1990_amendments.pdf.

To the extent that states are able to coordinate their programs, it is possible to minimize such distortions. This advantage was cited by MISO in its recent analysis, where it indicated that a regional approach can leverage the existing regional model of generation dispatch, transmission planning, and market operations.[5] Additionally, the ISO/RTO Council (IRC) recently indicated

[5] MISO, *Refresh of MTEP-10 Carbon Analysis*, February 19, 2014. Available at: https://www.misoenergy.org/Library/Repository/Meeting%20Material/Stakeholder/PAC/2014/20140219/2014021

in a proposal to EPA on section 111(d) that "coordinated regulatory programs among states can help to ensure that the efficiencies of least cost compliance across a regional, if not national, footprint can be maximized."[6]

### *Regional Greenhouse Gas Initiative*

The Regional Greenhouse Gas Initiative (RGGI) is a market-based program in Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Under RGGI, each state limits $CO_2$ emissions from electric power plants through an allowance-based cap-and-trade program. States have elected to sell nearly all emission allowances through auctions and invest proceeds in energy efficiency, renewable energy, and other consumer benefit programs. Regulated power plants may use a $CO_2$ allowance issued by any participating state to demonstrate compliance with their individual state program. Thus, the state programs, aggregated together, functions as a regional CO2 compliance market.

In comments to EPA on 111(d), the RGGI states noted that "[o]ur experience with RGGI demonstrates that regional cooperation can achieve the most cost-effective emission reductions, enable a transition to a lower-emitting and more efficient power sector and create economic benefits and jobs across the United States." A report by The Analysis Group found that "based on a review of RGGI's first three years, it would seem that the design, administration, and implementation of a market-based carbon control mechanism can be an effective way to control carbon emissions, while potentially providing additional economic and policy benefits."

Sources: RGGI, *Report on Emission Reduction Efforts of the States Participating in the Regional Greenhouse Gas Initiative and Recommendations for Guidelines under Section 111(d) of the Clean Air Act*, December 2, 2013; The Analysis Group, The Economic Impacts of the Regional Greenhouse Gas Initiative on Ten Northeast and Mid-Atlantic States, Review of the Use of RGGI Auction Proceeds from the First Three-Year Compliance Period., November 15, 2011. Available at: http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Economic_Impact_RGGI_Report.pdf.

Additionally, a range of stakeholders are discussing the value of allowing states to demonstrate compliance through investments in energy efficiency and renewables.[7] If a state wants to demonstrate compliance based on increased deployment of renewables, for example through its Renewable Portfolio Standard (RPS), it may have to propose a way to quantify and

9%20PAC%20Item%2003%20Refresh%20of%20MTEP10%20Carbon%20Analysis.pdf.

[6] ISO/RTO Council, *EPA $CO_2$ Rule–ISO/RTO Council Reliability Safety Valve and Regional Compliance Measurement and Proposals*, January 28, 2014. Available at: http://www.isorto.org/Documents/Report/20140128_IRCProposal-ReliabilitySafetyValve-RegionalComplianceMeasurement_EPA-C02Rule.pdf.

[7] To the extent a group of states wanted to implement a performance standard with trading, EPA and the states would still need to establish crediting protocols or guidance to account for and credit emission reductions driven by deployment of non-emitting sources, such as energy efficiency, renewables, or nuclear generation. A multi-state budget approach for compliance, as discussed in MJB&A's October 2013 White Paper, would eliminate the need to establish special crediting mechanisms for energy efficiency, renewables, or nuclear generation. Investments in these alternative resources would be accounted for under a state budget approach by lowering overall emissions, making a special crediting system unnecessary.

demonstrate that the emission reductions at fossil fuel-fired units resulted from investments in renewable energy resources. Because electricity flows across state lines, an RPS could drive renewables in one state that lead to reductions emissions in another state. If compliance is limited to individual states, EPA will likely need to determine which state receives the benefit of the reduction—the state driving the investment, the state in which the renewable energy source generated the electricity, or the state in which the displacement of emissions from a fossil fuel-fired power plant actually occurred. This challenge, could be mitigated if states are willing to join together in demonstrating compliance based on a common performance standard or emissions budget. The broader the region, the more likely it is that the renewable generator will be located and the reductions will occur within the same region.

Third, a multi-state compliance program may reduce the administrative costs of the program. State environmental agencies responsible for implementing section 111(d) have been facing budget cuts in recent years. By adopting a cooperative approach, states can pool their resources, potentially reducing administrative costs though, as discussed below, the coordination of a multi-state plan can also require resources and expertise.

## Potential Concerns Associated with Multi-State Compliance

Despite the benefits, some states may initially have concerns about entering into multi-state agreements. States may see the process of reaching agreement with other states as complicated and, given the short timeframe to submit plans, the additional coordination required may be a concern. EPA has indicated in public comments that it has heard this concern from a range of stakeholders who are concerned that the schedule established by the President will limit the ability to evaluate some options for flexibility, such as multi-state cooperation.

To help overcome this challenge, EPA and other stakeholders could develop a set of "model rules" to guide the state regulatory development process, facilitating the adoption of a common set of requirements and trading rules. States that adopt the same model approach could then allow trading or averaging among their regulated sources without having to conduct an extended regional stakeholder process. This is the same approach that EPA used in establishing regional trading programs for $NO_x$ (although in that case EPA only proposed a single model rule). EPA might also consider allowing a phased state plan submittal process whereby states electing to submit coordinated plans could submit their initial plan outlining the key components within a year and then submit a more detailed plan at a later date recognizing that agreeing on compliance options among a group of states may take additional time.

There may also be states that review EPA's proposal and determine that in-state sources have a reasonable path to compliance. Such a state may not want to join a multi-state framework, if it concludes that the most cost-effective reductions are in-state. In such cases, however, electric companies that operate in multiple states might prefer a multi-state approach if they view the ability to take advantage of the lowest-cost reduction opportunity within their entire fleet as advantageous. Also, conditions can change, and states may see flexibility as a benefit in the long term. Another concern that states will need to evaluate is the effects on electricity prices as a result of joining a multi-state compliance agreement relative to the impacts of an individual state plan.

It is also important to note that while multi-state agreements can mitigate many of the concerns that will result from a patchwork of regulatory approaches, multi-state plans will not solve every potential issue. For example, while a regional approach may mitigate most of the concerns associated with a patchwork regulatory approach, there would still be the potential for market inefficiencies or "seams issues" across adjoining wholesale electricity markets, which only a nationwide trading system would address.

## Multi-State Implementation Considerations

If a group of states decides to move forward with a multi-state approach to section 111(d) compliance, the group will have to consider a number of issues, including:

- The appropriate grouping of states,
- The preferred compliance approach,
- Administration of the compliance program, and
- Enforcement of the program.

Specific state targets have been a controversial element in prior multi-state rulemakings. It took stakeholders several years to establish RGGI in part because of the time spent developing the state emissions budgets. However, in the case of 111(d), many expect that EPA will establish the performance standards and/or budgets in the final rule.

### State Groupings

Implementing a multi-state compliance approach will require states to come together and develop a collaborative framework to meeting EPA's guidance. A first step will be for states to organize into appropriate groups. While GHG trading programs do not have to be geographically contiguous to be effective there are a number of potential existing models for

grouping states.

### *ISOs/RTOs*

It may be logical and economically efficient to group states based on their existing membership in ISOs/RTOs (see Figure 1). In addition, several regional grid initiatives in the west do not have RTO status, but may provide a useful basis for cooperation. ISOs/RTOs cover approximately two thirds of the U.S. (all or part of 38 of the 50 states). They centrally dispatch power plants within their footprint based on their marginal operating costs.

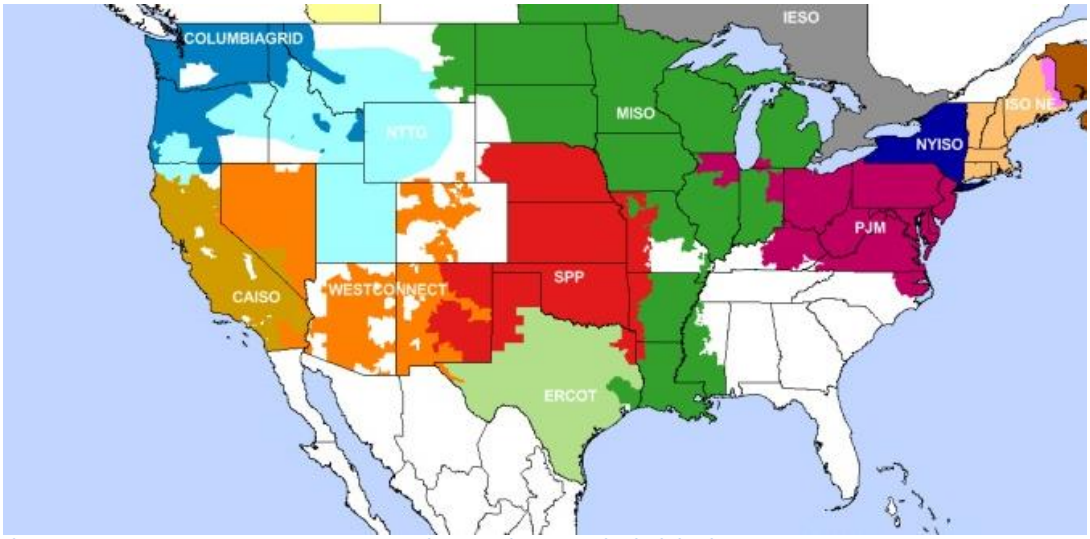


**Figure 1. ISOs, RTOs, and other major regional grid initiatives.**
Source: Ventyx.

Once subject to section 111(d), sources participating in ISO/RTO electricity markets would likely incorporate the cost of compliance into their supply bid, and the dispatch order would change accordingly. In this way, the existing regional dispatch model could facilitate compliance via the lowest cost reduction opportunity with the ISO/RTO.

Recently, the ISO/RTO Council (IRC) submitted comments to EPA on section 111(d) and noted that "regions subject to a single integrated dispatch can provide an effective measurement area for relevant state implementation plans and measuring their impact" because states in an ISO/RTO already share the costs and benefits of regional dispatch rather than requiring that dispatch occur within each state's individual boundaries. The comments further explained that "regional dispatch can serve as an efficient regional measurement area that can be utilized by

existing regional greenhouse gas initiatives or any such future multi-state agreements."[8]

Thus, the IRC requested that EPA allow states the option of "utilizing reductions achieved across the regional dispatch footprint in measuring compliance pursuant to the individual state's SIP."[9]

Of course, states in a given ISO/RTO region would not be obligated to coordinate with all of the other states in that region. Even if all states elected to coordinate, they would still need to evaluate how to address certain issues. For example, some states are in multiple ISOs/RTOs. Given that section 111(d) contemplates state-based compliance, compliance in a state, such as Ohio, could prove complicated if states in MISO agree to implement a multi-state budget approach but states in PJM decide to adopt a tradable performance standard with a common currency among the states. In such an example, Ohio would need to determine whether it could utilize different compliance options in its state or elect to participate in only one of the ISO/RTO's plans. Note, however, that this situation would be somewhat simplified by the fact that generators can only participate in a single ISO/RTO. A state could group its generators accordingly.

A benefit of multi-ISO/RTO states is that they may have an incentive to push both regions to pursue similar approaches. This could lead to harmonization across PJM, MISO, SPP, and ERCOT, since there is overlap between each of the neighboring regions. Such an outcome may also be helpful in addressing any leakage concerns between the two regions. Further alignment could result with NYISO and ISO-NE, since Delaware and Maryland are in PJM and RGGI, and would need to consider how best to coordinate participation in both markets. (New York and New England participate in RGGI.)

### *Regulated Wholesale Electric Markets*

For regulated wholesale electric markets in the Southeast, Southwest, and Northwest, electric utilities are responsible for system operations and management and usually for providing power to retail consumers. The states in these regions, however, may also have an interest in coordinating compliance because there are often companies that operate in multiple states and compliance may be more cost-effective if a company can optimize across its fleet, even if the fleet is not all dispatched by a single entity, as in the case of an ISO/RTO. Further, each of these

[8] ISO/RTO Council, *EPA $CO_2$ Rule – ISO/RTO Council Reliability Safety Valve and Regional Compliance Measurement and Proposals*, January 2014. Available at: http://www.isorto.org/Documents/Report/20140128_IRCProposal-ReliabilitySafetyValve-RegionalComplianceMeasurement_EPA-C02Rule.pdf.
[9] Id.

regions may find the overall cost of compliance drops as the group of states grows larger, as discussed above. The decisions by states will likely be driven by the stringency of EPA's emission guidelines as well as any criteria EPA outlines for how it will evaluate state plans.

### *Alternative Groupings*

Alternative groups of states may also align based on the framework approach that they are electing to implement. For example, a group of contiguous or noncontiguous states could decide to implement a budget approach if they see an advantage in allowing their sources to pool their credits. Several potential alternative groupings already exist in the form of multi-state, non-ISO/RTO regional initiatives, such as the WestConnect planning area in the west, or the SERC regional reliability council in the southeast. As long as states elect to join a certain group, and EPA approves the plan as satisfactory under the federal emission guidelines, the Act does not constrain how states may choose to collaborate.

## Compliance Approaches

Once a grouping has come together, the participants would need to agree on the general compliance framework used to demonstrate equivalency with the federal emission guidelines. The compliance framework would serve as the basis for a multi-state plan memorialized in each state's compliance plan submitted to EPA.

In the federal emission guidelines, EPA may develop a rate-based performance standard and then translate that performance standard into state budgets, giving groups of states the choice to develop a multi-state plan based on rate-based performance standards or emissions budgets. In order to identify the appropriate framework, states would need to evaluate the advantages and disadvantages of the options—a rate-based system, a budget-based approach, or another mechanism. As discussed in MJB&A's October 2013 White Paper, there are trade-offs inherent in every option. For example, a flexible rate-based system would avoid placing a specific limit on emissions. However, methodologies to account for and credit contributions from non-covered sources would have to be developed or approved by EPA, and states would need to ensure that for any energy efficiency measures, actual reductions are being achieved. Additionally, depending on the design, a blended rate-based approach could depress wholesale electricity prices in the short run, but raise program costs in the long run by reducing incentives to invest in cost-effective GHG reductions in competitive power markets and failing to recognize the value of existing clean resources.[10] Under a state budget system, states would need to agree

[10] See, e.g., Burtraw, Dallas and Woerman, Mat, *Technology Flexibility and Stringency for Greenhouse Gas Regulations*, July 2013, RFF DP at 13-24.

on the appropriate methodology for distributing any emission permits and would need to conduct analyses of economic trends and natural gas prices to determine the appropriate budget level, which can be difficult. However, states may see advantages in a budget-based approach as it would eliminate the need for establishing special crediting mechanisms for energy efficiency, renewables, or nuclear generation because investments in these resources will lower the overall emissions in the region. The budget-based approach can also avoid creating market distortions that reduce the cost effectiveness and environmental benefit of the program. The following outlines how each approach could work in a multi-state context.

### *Rate-based System*

Under a rate-based system, sources earn credits by generating electricity below the applicable rate and sources above the applicable rate have the option of purchasing credits to come into compliance. Under a multi-state rate-based approach, a group of states could make clear in their state plans submitted to EPA that affected sources would meet the appropriate rate either by continually meeting the rate or by holding a sufficient number of credits from the multi-state program to demonstrate compliance. The group of states could also agree to provide credits to energy efficiency and existing clean generation, for example, provided they agreed to a common set of measurement and verification protocols approved by EPA.

Alternatively, a group of states may want to implement an emission standard(s) that regulated sources in the region must meet through a tradable performance standard. This approach may be attractive to some states to ensure the sources in different states, but within the same ISO/RTO, for example, are required to meet the same standard(s).

### *Budget-based System*

There is also an interest among some stakeholders in a state budget approach similar to RGGI or the $NO_x$ SIP call. If the group of states remains under the combined budget, EPA should be able to approve the states as complying with their section 111(d) obligations. The states could jointly administer a regional trading program and require each generator to surrender an emission permit for each ton of $CO_2$ emitted. Thus, the sources would have the flexibility to implement the most cost-effective compliance strategies across the entire geographic region. The participating states could be adjacent to each other or they could be distributed throughout the country. Regardless, there may be greater economic efficiency by joining together under a common trading system. A multi-state approach could potentially allow a state to exceed its original state budget, but as long as the group of states collectively meet EPA's emission guidelines, then the emission reductions on a whole among the states would be reduced and the

environmental benefit would remain.

### *Alternative Systems*

EPA has indicated a willingness to consider a broad range of compliance options from states for section 111(d) state plans. While many stakeholders have evaluated the pros and cons of a rate-based versus budget-based approach, additional alternatives are also starting to emerge. For example, Great River Energy and the Brattle Group have proposed a fee system that would be implemented by ISOs/RTOs.[11] Under the proposed approach, states within a regional power market would translate targets proposed by EPA into a regional budget. To meet the regional budget, the ISO would impose a carbon price on electricity generated in the market. This would increase the cost of higher emitting resources relative to lower emitting alternatives. The ISO would refund the revenues collected through the carbon price to load serving entities for the benefit of their customers.

The Clean Air Task Force has also proposed a hybrid approach that would impose a state budget for coal-fired boilers and a rate-based performance standard for natural gas turbines. The proposal would offer a model emission permit trading rule to facilitate interstate trading and credit trading would be allowed among coal-fired boilers. A group of states interested in this approach could aggregate their budgets for the coal boilers in the multi-state region and allow trading across the region. Natural gas turbines in those states would meet the applicable emissions rate.

Regardless of the form of the regulation, the key for any multi-state program is the criteria with which EPA would evaluate the state plans. However, in general, if a state can demonstrate reductions consistent with EPA's federal emission guidelines from the source category, EPA should be able to approve alternative design options. Given the potential benefits of multi-state compliance, EPA may make clear in the final rule how EPA will evaluate such plans, and it may be helpful for EPA or other stakeholders to consider outlining several model rules that facilitate the process of adopting multi-state compliance plans.

## Administration

An additional question states will need to address is how to administer the program. One potential model for states is provided by RGGI, which is administered by RGGI, Inc., a 501(c)(3)

[11] The Brattle Group, *Great River Energy and The Brattle Group Present Innovative Approach for Compliance with EPA Greenhouse Gas Regulations*, February 5, 2014. Available at: http://www.brattle.com/news-and-knowledge/news/616.

non-profit corporation created to support development and implementation of RGGI. RGGI, Inc. maintains the system to report data from emissions sources, implements the platform to auction the allowances, monitors the market related to the auction and trading of allowances, and provides technical assistance to the participating states for reviewing emission offset projects as well as evaluating any changes to states' RGGI programs. The signatory states fund RGGI, Inc. in proportion to their annual $CO_2$ budgets. The corporation's 2014 budget is $2.4 million, with approximately half attributed to direct operating costs and the other half for contractors, who manage the online $CO_2$ allowance tracking system (COATS), implement and monitor the allowance auctions and secondary market, and provide technical services such as modeling and offset protocol development. Potomac Economics serves as the Market Monitor for RGGI, Inc., and SRA International, Inc. manages COATS.

Some stakeholders may also conclude that EPA is the best entity to administer any trading programs, including multi-state programs. EPA has expertise in running a trading program under the Acid Rain Program and $NO_x$ programs and already collects $CO_2$ emissions data from power plants. Thus, states may see value in having EPA manage any trading program. However, EPA has not suggested that it will propose to administer any compliance programs under section 111(d). Thus, stakeholders will need to evaluate the pros and cons of requesting EPA's assistance and explore the advantages and disadvantages of other entities that may be able to coordinate multi-state plans such as an ISO/RTO. For example, some regulators may provide comments to EPA that a one year deadline for submitting state plans is difficult to meet if states need to administer the program without EPA's assistance.

### Enforcement

States will also need to agree on how they will enforce the plan, and it will be important to consider how EPA will evaluate enforcement under section 111(d) by a group of states. To the extent a group of states agrees to use a common currency for sources in their state to demonstrate compliance, enforcement could be relatively simple in that sources would need to ensure each held sufficient emission permits to cover their emissions or emissions rate, and each state would be responsible for enforcing that obligation. RGGI, Inc. has no regulatory or enforcement authority. Rather, each state retains its authority based on its implementing regulations and/or legislation.

However, there may be cases in state budget approaches where one state exceeds its budget and another state's emissions are below its budget, but on a regional basis, the region remains under the applicable joint budget. For these approaches, it will be important for EPA to indicate if

such a compliance demonstration is acceptable under section 111(d). For more complicated approaches, states will likely need to engage with EPA in the development of their plans to ensure they are designed in a manner EPA believes is consistent with section 111(d) in terms of implementation and enforcement. EPA and states will also need to consider the implications of one state and/or the sources in one state not meeting the compliance obligations. For example, states will need to specify whether all sources in the multi-state agreement are responsible for noncompliance or just the sources that exceeded the applicable rate or budget. Given that the compliance obligation under section 111(d) is source specific, the sources that violate the rate or fail to hold sufficient emission permits are likely responsible. However, in the case of states relying on their RPS programs or other programs to demonstrate compliance, the states will need to agree on what entities in the multi-state plan are responsible if a state were unable to achieve its RPS target, for example.

## Conclusion

Multi-state compliance plans have the potential to provide significant benefits to states as they explore their options under section 111(d). If designed appropriately, multi-state compliance plans may mitigate some of the interstate dynamics and market inefficiencies that could result if states take different regulatory approaches under section 111(d). A patchwork of different state plans could lead to perverse incentives as a result of electricity markets that cross state borders. Coordinating compliance plans can help minimize the resulting economic distortions.

As states evaluate the proposal EPA is expected to release this June, states and stakeholders will need to evaluate the benefits of multi-state compliance plans and determine what additional guidance from EPA is necessary to facilitate the submittal of such plans. Additionally, it will be important to assess if there are design options that could mitigate some of the potential drawbacks of multi-state agreements in order to facilitate investment in the most cost-effective emission reduction opportunities in the electric sector.