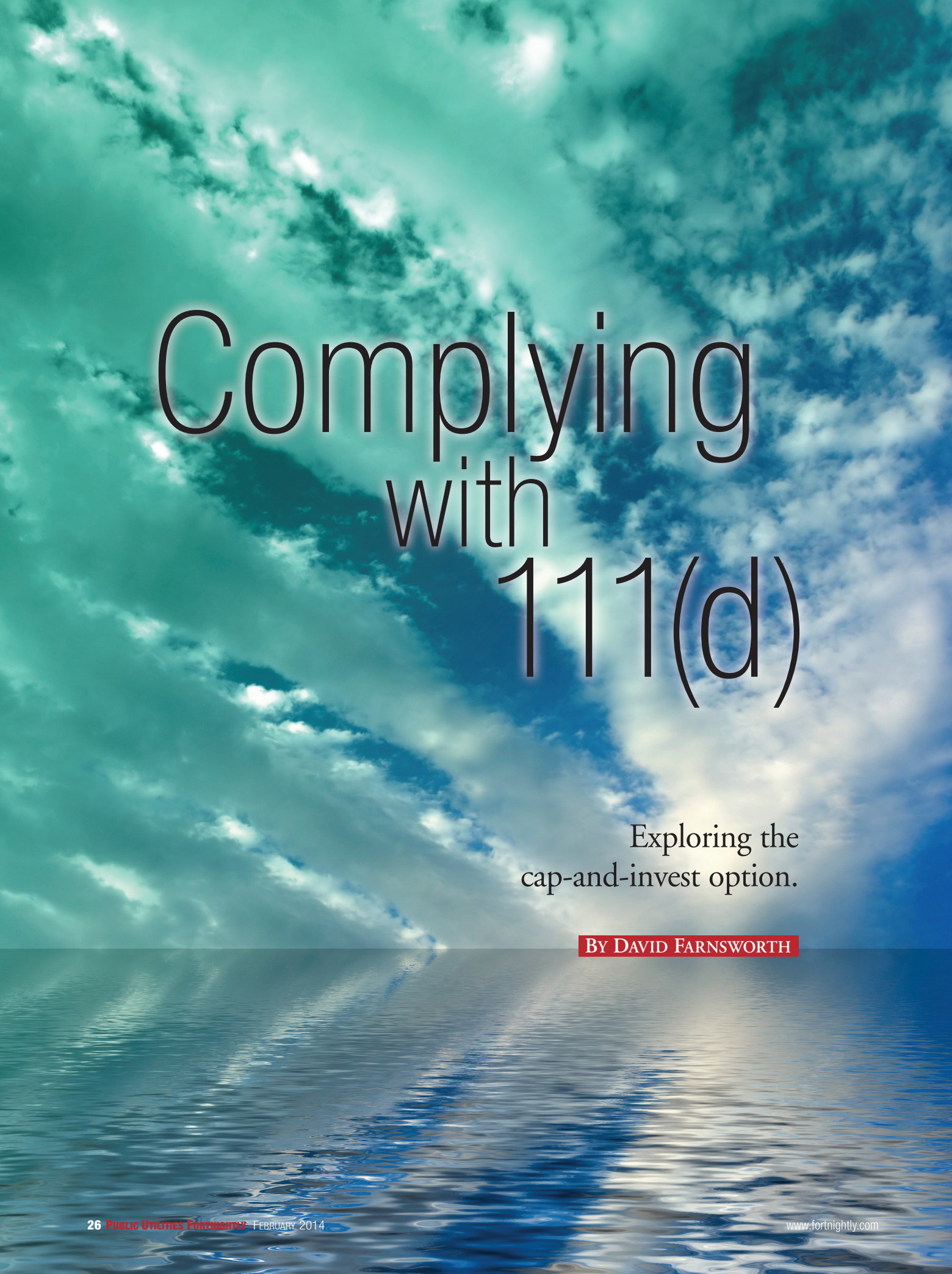

Complying with 111(d)

Exploring the cap-and-invest option.

By David Farnsworth

With the United States Environmental Protection Agency's (EPA) proposed Section 111(d) New Source Performance Standards (NSPS) for new plants published in January 2014 – and a proposed rule for existing fossil generators expected in June 2014 – many states are exploring the development of "equivalency plans" that would enable them to flexibly meet compliance requirements in the least disruptive manner and at the lowest cost. States are likely to have many options, as demonstrated by the State of Kentucky, for example, in its recent "Greenhouse Gas Policy Implications for Kentucky under Section 111(d) of the Clean Air Act."[1]

One option with which states might not be familiar is known as "cap-and-invest." The most prominent example is the Regional Greenhouse Gas Initiative (RGGI, pronounced "Reggie"), an electric sector CO_2 emissions reduction program for fossil generators established by Northeastern states, which started operation in 2009. While there's plenty of conventional wisdom about "cap-and-trade," there's far less understanding of cap-and-invest. States shouldn't confuse the two, and as they weigh various approaches to developing equivalency plans, states might want to take a page from the RGGI playbook, and see whether cap-and-invest could serve as a 111(d) compliance model.

Section 111(d) and GHG Standards

The Clean Air Act (CAA) is generally very prescriptive, in that specific pollutants are explicitly addressed in different sections of the Act. For example, Section 112 focuses on air toxics like mercury, and Sections 108 and 109 focus on criteria pollutants like sulfur dioxide (SO_2) and particulate matter. Section 111 doesn't follow that pattern. Unlike other more specific sections of the CAA, this section wasn't drafted with greenhouse gases in mind. However, Section 111 was designed to prevent any pollutants not covered under the other, more prescriptive sections of the CAA from going entirely unregulated. Consequently, EPA's task under 111(d) is to construct a program with little specific statutory guidance which, of course, is a significant undertaking. In doing so, EPA will need to develop a framework that strikes a balance between coordinating more than 50 state jurisdictions under one program for fossil electricity generators, and empowering states to use the most effective and least expensive compliance options available.

EPA already has proposed NSPS for GHG emissions from new power plants, and expects to issue standards for existing plants by June 2014, and to finalize them in June 2015. Section 111(d) of the Clean Air Act sets out a two-step federal and state process which the Supreme Court summarized as, "for existing sources, EPA issues emissions guidelines; in compliance with those guidelines and subject to federal oversight, the States then issue performance standards for stationary sources within their jurisdiction."[2]

EPA should be flexible as long as state plans achieve emissions reductions at least equivalent to those under EPA's guidelines.

The term "guidelines" notwithstanding, EPA establishes binding requirements that states will have to address when they develop plans to regulate the existing sources in their jurisdictions, and a schedule for doing so.[3] EPA's emissions guidelines must reflect "the application of the best system of emission reduction … that has been adequately demonstrated."[4] EPA is also required to consider the cost of achieving reductions, any non-air-quality health and environmental effects, and energy requirements. And Section 111(d) directs EPA to "take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies."[5]

One of the central issues facing EPA is the question of how emissions reductions will be achieved. EPA has noted that generators might realize some limited efficiencies and related emissions reductions through technology investments that include, for example, soot blowers and heat recovery units added to flue gas and cooling systems. None of these, however, possesses emissions reduction capacity comparable to scrubbers used to reduce SO_2 emissions or selective catalytic reduction to reduce NOx

1. *Greenhouse Gas Policy Implications for Kentucky under Section 111(d) of the Clean Air Act*, Kentucky Energy and Environment Cabinet, Frankfort, KY, October 22, 2013.

2. *American Electric Power Co. v .Connecticut*, 131 S. Ct. 2527, 2537 38, (2011) (citations omitted).
3. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44354, 4448687 (Advanced Notice of Proposed Rulemaking), July 30, 2008.
4. 40 C.F.R. § 60.22, 23 (2009).
5. CAA § 111(d)(2)(B).

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emissions.[6] While both compliance solutions and the emissions reduction requirements for existing plants are unknown at this time, EPA has indicated that it might be amenable to a system-wide array of solutions for 111(d) compliance, writing "the unique characteristics of carbon pollution and the interconnected nature of the electric power sector call for a broad and flexible approach to designing the program for existing power plants."[7]

The Role of the States

In compliance with EPA's guidelines, and subject to EPA approval, Section 111(d) requires states to issue performance standards. EPA and the states must also follow a procedure similar to the state implementation plan (SIP) process outlined in Section 110 of the Clean Air Act. SIPs, often referred to as "equivalency plans" in this context, contain a state's strategies for complying with EPA's emissions guidelines, and provide justification for the proposed approaches. While states are afforded significant flexibility under Section 110, they are also bound by certain limits; most important, state equivalency plans must be "no less stringent" than EPA's emissions guidelines. Various thoughtful and potentially promising equivalency plan models have been proposed by the State of Kentucky, the Natural Resources Defense Council, and the National Climate Coalition.[8] These approaches have in common the assumption that EPA should be flexible as long as state plans achieve GHG emissions reductions that are at least equivalent to those that would be achieved under EPA's guidelines.

By employing Section 110 as the template for state action, Congress has provided states with significant leeway in identifying the means at their disposal to meet 111(d) requirements. Section 110 directs states to employ "enforceable emission limitations" in their plans, ensuring the ability of states to take action to control pollution.[9] In addition to this enforceability criterion, the statute speaks without limit to "other control measures, means, or techniques" to achieve the same emission limitation goals.[10] Furthermore, the statute lists examples of flexible compliance approaches, recognizing "economic incentives" such as "fees, marketable permits, and auctions of emissions rights."[11] Regardless of the equivalency plan approach that states ultimately settle on, Section 111(d)'s reliance on Section 110 is a green light for states to explore and develop ways to meet EPA's guidelines that recognize and incorporate the many clean energy investments states have made and can position themselves to make in the future.

SO_2 Redux

Between 2003 and 2009, the Northeast states created and used RGGI as a forum to wrestle with many of the same issues that EPA will have to decide in the next several months in setting out a framework for state equivalency plans. The process of designing RGGI provides an example of how states might design equivalency plans that are relatively easy to implement, serve multiple state policy objectives simultaneously, apply regionally across several states, and have other desirable attributes.

Central to the RGGI discussions was the question of how to preserve state autonomy and policy flexibility while at the same time developing an enforceable program that effectively addresses CO_2 emissions from fossil generators. State staff drew upon EPA programs and regulatory mechanisms that had proved effective in other air pollution control contexts, and which they thought might prove suitable in a CO_2 program for fossil power generators when they designed RGGI. As states consider how to develop equivalency plans, one of the first questions they might want to ask is whether EPA will comprehend their plan and be able to work with it. As explained below, this is one of the key questions the staff who designed RGGI had in mind and wanted to be able to answer in the affirmative.

RGGI states today have a system that EPA might recognize as an equivalency plan.

State staff first met in the fall of 2003 to develop a cap-and-trade program for the electricity sector in the Northeast states. Their meetings included environmental and energy agency representatives from Connecticut, Delaware, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, and Vermont.

Many of these people had worked together before – the air regulators on regional aspects of the federal acid rain (SO_2) and NOx budget programs, and energy regulators on regional wholesale market development. Although it wasn't said outright, the original design impulse for what ultimately became RGGI can be characterized as, "We did it with SO_2; let's do it with

6. *Available and Emerging Technologies for Reducing Greenhouse Gas Emissions from Coal-Fired Electric Generating Units*, United States Environmental Protection Agency, Office of Air and Radiation, Research Triangle Park, NC, October 2010.
7. *Clean Air Act and Upcoming Carbon Pollution Guidelines for Existing Power Plants*, United States Environmental Protection Agency, (accessed Nov. 30, 2013).
8. See *e.g.*, *Greenhouse Gas Policy Implications for Kentucky under Section 111(d) of the Clean Air Act*, Kentucky Energy and Environment Cabinet, Frankfort, KY, Oct. 22, 2013, note 2; Daniel A. Lashof, Starla Yeh, David Doniger, Sheryl Carter, and Laurie Johnson, *Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America's Biggest Climate Polluters*, Natural Resources Defense Council, Dec. 4, 2012; and *Using EPA Clean Air Act Authority to Build a Federal Framework for State Greenhouse Gas Reduction Programs,* National Climate Coalition.
9. CAA § 110.
10. *Id.*
11. *Id.*

CO_2." The background that state staff had in the acid rain and NOx cap-and-trade programs provided a ready starting point for designing and administering a similar program for CO_2.

By 2003, the federal acid rain program developed under the 1990 Clean Air Act Amendments was considered very successful. Relying on a combination of fuel switching to low-sulfur Powder River Basin coal, scrubbing technology, and allowance trading, electricity generators around the country were selling electricity and complying with the program. Why couldn't the Northeast likewise cap its CO_2 emissions from fossil units; create allowances for each ton of those emissions; allocate the allowances to emitters; and require the emitters to surrender allowances corresponding to their emissions at the end of each compliance period?

In addition to emulating the acid rain model, a complementary design impulse for RGGI was that it should be a modest program, one that individual states could adopt, but hopefully also one that they could hand off to EPA if and when the federal government instituted CO_2 reduction requirements. The RGGI program was initially designed with this hand-off in mind, and many of the original design proposals, not surprisingly, looked like road-tested features of EPA's acid rain and NOx budget programs:

- *Coverage:* RGGI applies to fossil electric generating units 25 MW and larger, just like the units covered by the federal acid rain program.
- *Emissions Data:* These "Acid Rain Units," by law, already provide EPA with continuous emissions monitoring (CEM) data as part of other federal compliance requirements. The Northeast states decided to use these data instead of developing a whole new emissions reporting system, avoiding an unnecessary burden on themselves and their fossil generators.
- *Use of a Model Rule:* Because the RGGI program is a group of similarly designed but entirely separate individual state programs, state staff developed a model rule that each state used in developing its own regulation. The template for the model rule was EPA's NOx budget rule.
- *Allowance Tracking:* RGGI's CO_2 Allowance Tracking System (COATS), was designed by Perrin Quarles Associates, the same company that designed the tracking platform used by EPA's acid rain and NOx budget programs, a model that both state and federal air regulators knew and with which they were comfortable.
- *Allowance Allocation:* The acid rain program allocates nearly all emissions allowances to compliance entities for free, and staff initially designed the program echoing that approach. That assumption was tested and modified – with profound results.

The Northeast states' inclination to develop a RGGI program that piggybacked on a number of existing systems and possessed other recognizable features was a good idea. Not only were state regulators familiar with existing program models, so were the potential compliance entities, *i.e.,* generators and their owners. Despite congressional inaction in legislating a federal program that might have allowed the Northeast states to hand-off the program they had developed, the RGGI states today have a system that they believe EPA might recognize as an equivalency plan, and that EPA staff readily recognizes and comprehends.

In short, in developing RGGI, the Northeast states employed existing air compliance systems and models, and leveraged existing relationships to achieve new program design goals. As states consider possible models for developing their own 111(d) equivalency plans, they might want to keep this approach in mind. EPA almost certainly will consider favorably the administrative efficiency of using existing and familiar systems – and regional (multi-state) systems where feasible – when it evaluates state equivalency plan proposals.

By moving beyond the fence line and out into the power system, the RGGI states took a giant leap beyond conventional wisdom about cap-and-trade.

CO_2 Isn't Exactly like SO_2

While the Northeast states used existing regulatory models in an insightful and creative way, they also recognized limitations to these tried and true air pollution control analogues. These states had to rethink certain assumptions due to the limited availability of compliance technologies and concerns over potential program costs for electricity consumers. Extensive engagement between energy regulators and air regulators was critical to recognizing and addressing these issues. The states eventually decided to move "beyond the fence line" and structured a program that would engage and incorporate state clean energy programs. They also broke with tradition in deciding to auction, rather than allocate allowances to sources for free.

As EPA develops proposed guidelines, and states decide how they will comply, it will be necessary to square Section 111's "best system of emissions reduction" (BSER) language with the discrepancy between the few choices and limited promise of within-the-fence engineering solutions, and the successful clean energy investments being made by states around the country. EPA is likely to hear from many that BSER implies significant discretion to look beyond site-specific strategies to GHG reductions available across the electricity sector, just as the Northeast states heard from stakeholders in the RGGI process that significant tons of CO_2 could be avoided by state clean energy investments. Furthermore, both EPA and the states will be guided by concerns over the "cost of achieving reductions."[12] The

12. CAA § 111(d)(2)(B).

Northeast states engaged in similar discussions while developing the RGGI program, and they fashioned solutions that likely will prove helpful in the 111(d) context.

In working through design details with stakeholders, RGGI staff soon recognized that, in certain important respects, CO_2 isn't like SO_2. They also recognized limits to the acid rain program model that needed to be addressed. First, no affordable control technologies exist for CO_2 that can remove significant amounts of emissions. Carbon capture and sequestration, while promising, wasn't commercially available. What are today being referred to as "within-the-fence" controls, *e.g.,* technologies like soot blowers and flue gas and cooling system heat recovery units, are capable of producing some degree of plant efficiencies and related emissions reductions, but nothing comparable to the level of reductions achievable for SO_2 from scrubbers and for NOx from selective catalytic reduction.

Second, unlike the acid rain compliance strategy of switching from high-sulfur Illinois Basin or Appalachian coal to low-sulfur Powder River Basin coal to reduce SO_2 emissions, there's no corresponding coal switching solution for reducing CO_2 emissions.[13] There's no such thing as low-carbon coal.

The Northeast states weren't only faced with having no available emissions control technologies, but of greater concern, they faced the potential that the RGGI program they were designing would raise electricity rates with no protection for consumers.

The states were concerned about RGGI program costs – and making sure they wouldn't be unnecessarily high. They also recognized that the acid rain program's free allowance allocation approach wouldn't be optimal for use in the restructured electricity markets in the region. The initial assumption had been that allocating allowances for free, rather than selling them to compliance entities, would lower or avoid program costs on electricity customers.

But the Northeast states soon recognized that electricity generators would still include the opportunity cost of the allowances in their wholesale market electricity bid prices, which would increase the retail price of electricity throughout the region due to higher wholesale market clearing prices.[14] Concluding that the allowance costs would be included in the price for all electricity – not only the limited percentage needed for compliance – the states declined to follow the acid rain program's free allocation approach. They decided instead to auction allowances in order to raise revenues that states could use to hedge potential price effects on consumers through investment in end-use energy efficiency.

The states also reconsidered their own clean energy programs and asked what connection those efforts might have to reducing CO_2 in the region. They modeled the effects of individual state clean energy programs (*e.g.,* energy efficiency and renewable portfolio standards) to determine how these programs might affect RGGI program costs.

The American Council for an Energy-Efficient Economy (ACEEE), which participated in the RGGI stakeholder process and was a member of its modeling sub-group, helped conduct modeling exercises in which end-use energy efficiency was treated as a resource in the region.[15] This modeling showed that the RGGI program could decrease electricity demand growth, and make reducing carbon less expensive. The modeling also showed that efficiency investments would reduce the exposure of electricity consumers to higher energy prices and provide numerous other benefits, including: decrease carbon allowance prices by 25 percent; reduce the need for new fossil capacity by 33 percent; reduce industrial customer bills by 5 percent; and reduce residential bills by 12 percent.

Because allowance prices have remained low, critics consider the RGGI program ineffective. However, RGGI states have raised more than $1.5 billion.

Modeling also demonstrated that further feasible investments in efficiency would produce even greater savings.

The RGGI modeling not only helped show that low allowance prices could contribute to reducing CO_2 emissions without imposing unreasonable costs on consumers, it also demonstrated that investment in end-use efficiency reduces consumer exposure to energy costs. In short, clean energy policies, with an emphasis on energy efficiency, could cost-effectively help secure the emission reductions the states originally set out to achieve.

Today, RGGI allowances are auctioned and states invest part of the auction revenue for the benefit of consumers. The Northeast states initially agreed to preserve their discretion to use allowance revenues as each state saw fit. However, in their December 2005 memorandum of understanding (MOU), they agreed to use 25 percent of revenues for "consumer benefit or strategic energy purposes," which includes the "use of the allowances to promote energy efficiency, to directly mitigate electricity ratepayer impacts, to promote renewable or non-carbon-emitting energy technologies, to stimulate or reward investment in the development of innovative carbon emissions abatement tech-

13. In 2004 and 2005, RGGI states weren't experiencing the level of coal to natural gas switching occurring today.
14. RGGI is located nearly entirely in restructured wholesale market states in the Northeast. While Vermont and part of New Hampshire have retained vertically integrated electricity systems, these companies purchase power in a restructured wholesale market.
15. Bill Prindle, *Energy Efficiency as a Resource for RGGI*, American Council for an Energy Efficient Economy, RGGI Staff Working Group, Dec. 15, 2004.

nologies with significant carbon reduction potential, and/or to fund administration of this Program."[16] The MOU recognizes the various resources that states could fund to reduce consumer exposure to the program's costs and to ensure reductions in CO_2 emissions.

The National Association of Regulatory Utility Commissioners' Task Force on Climate Policy recognized this key connection between clean energy policies and electric sector carbon reductions when it wrote in 2009: "For decades, the goals of State clean energy investment have been consistent with initiatives that only now are being explicitly described as 'carbon policies.' Recent experience demonstrates that such policies as programmatic end-use energy efficiency and renewable portfolio standards are not merely 'complementary' to the price signal established by a carbon policy, but could constitute the primary means for reducing CO_2 emissions in the energy sector."[17]

Cap and Invest

Modeling the effects of state clean energy programs on program goals and costs led to perhaps the most significant design decisions of the RGGI program, namely to allocate allowances by auction and to invest auction revenues in energy efficiency and other programs that would benefit energy consumers. By moving beyond the fence line and out into the power system, and affirmatively funding clean energy programs rather than simply relying on the price effect of a cap, the RGGI states took a giant leap beyond conventional wisdom about cap-and-trade. In doing so, they created the cap-and-invest approach.

There is an apparent paradox here. Because the allowance prices (*i.e.,* price per ton) have remained low, some critics consider the RGGI program to be ineffective. They say the program is sending too weak a signal about the cost of carbon-emitting generation and the value of clean energy resources.[18] However, since its first auction in 2008, RGGI states have raised more than $1.5 billion. They have done this with allowance prices clearing between roughly $2.00 and $3.00.[19] Today, sharing auction revenues in proportion to the energy produced by their fossil generation, the states invest over half that amount in energy efficiency, thereby helping to keep the costs of RGGI allowances low.

In December 2013, RGGI reported that its most recent quarterly auction "generated $114.9 million for reinvestment by the states in a variety of consumer benefit initiatives, including energy efficiency, renewable energy, direct bill assistance, and greenhouse gas abatement programs."[20] It reported that these investments "will offset the need for more than 27 million MWh of electricity generation and 26.7 million British thermal units (Btu) of energy generation, [and that] the savings will help avoid the emission of 12 million short tons of carbon dioxide pollution."[21]

In another analysis of the states' use of RGGI auction revenues from the program's first three-year compliance period (2009 through 2011), the Analysis Group reported that the investments are producing significant benefits to the states' economies. "Customers will save nearly $1.1 billion on electricity bills, and an additional $174 million on natural gas and heating oil bills, for a total of $1.3 billion in savings over the next decade through installation of energy efficiency measures using funding from RGGI auction proceeds to date," according to the report.[22]

A small effect in rates is actually a substantial funding stream for compliance obligations or other purposes.

While the Northeast states relied on the acid rain program for many of its well-designed features, they moved away from that model and identified aspects of the power system where they could achieve emissions reductions at even more reasonable costs than cap-and-trade could provide. They managed to thread the needle in creating a modest program whose compliance costs are low enough to have limited rate effects, yet substantial enough for the states to use allowance revenues to fund clean energy programs that further reduce CO_2 emissions.

Envisioning Equivalency Plans

Allowance prices in the most recent RGGI auction cleared at $3.00. A program imposing allowance costs of $3.00 per ton on CO_2 emissions could raise millions of dollars to support state 111(d) equivalency plan program investments in energy efficiency, renewable energy, and other clean energy programs.

16. Regional Greenhouse Gas Initiative Memorandum of Understanding, Section G, Dec. 20, 2005.
17. *State Clean Energy Policies: The Foundation for an Electric Sector Cap-and-Trade Program*, National Association of Regulatory Utility Commissioners, July 2009. In 2007, in the expectation of Congress passing climate legislation, NARUC established a Task Force on Climate Policy. It was the predecessor of its current Task Force on Environmental Regulation and Generation.
18. This sort of criticism is echoed and amplified in the European Union, where the low cost of allowances in the EU Emissions Trading System is seen as a sign of market failure and cause for redesigning the program. See, e.g., *ETS, RIP?* The Economist, April 20, 2013.
19. For more information on RGGI allowances and RGGI States' use of auction revenues, see *RGGI Auction Tracker: State Allocations and Spending Plans*, Environment Northeast, June 2013.
20. *CO_2 Allowances Sold at $3.00 at 22nd RGGI Auction*, Regional Greenhouse Gas Initiative, Dec. 6, 2013.
21. *Regional Investment of RGGI CO_2 Allowance Proceeds*, Regional Greenhouse Gas Initiative, Nov. 2012, .
22. Susan F. Tierney, Paul J. Hibbard, Andrea M. Okie, and Pavel G. Darling, *New Analysis Quantifies Economic Impact of Regional Greenhouse Gas Initiative in Ten States*, Analysis Group, Nov. 15, 2011.

FIG. 1 ILLUSTRATIVE IMPACT FOR OF A $3.00/TON CARBON FEE ON SELECTED UTILITIES

Utility	States[i]	2011 Total Generation (TWh)	2011 Fossil Fuel Fired Generation (TWh)	2011 Total CO_2 Emissions (million tons)[ii]	CO_2 Emissions Rate (Lbs/MWh)[iii]	Anticipated Annual Revenue ($ million)	Cost ($/MWh)	Cost ($/kWh)
Southern Company	AL, GA, FL, MS	185.9	151.8	130.2	1,401	$390.5	$2.10	$0.0021
American Electric Power	AR, IN, KY, LA, MI, OK, TN, TX, VA, WV	177.6	158.1	157.6	1,775	$472.9	$2.66	$0.0027
Exelon	MD, IL, PA	152.9	8.9	7.3	95	$21.9	$0.14	$0.0001
Duke Energy	OH, IN, KY	147.4	100.6	93.5	1,268	$280.4	$1.90	$0.0019
Entergy	AK, LA, MS, TX	131.9	50.4	38.6	585	$115.8	$0.88	$0.0009
FirstEnergy	OH, PA, NJ, WV, MD	112.3	82.2	85.7	1,527	$257.2	$2.29	$0.0023
Dominion	NC, VA	99.7	54.2	45.2	908	$135.7	$1.36	$0.0014
Progress Energy	NC, SC, FL	88.7	63.0	49.8	1,122	$149.3	$1.68	$0.0017
Xcel Energy	CO, MI, MN, NM, ND, SD, TX, WI	74.3	60.1	58.2	1,567	$174.7	$2.35	$0.0024
Avista Utilities	WA, ID, OR	6.9	2.1	1.9	548	$5.7	$0.82	$0.0008
IDACORP	ID, OR	15.9	5.0	5.3	670	$16.0	$1.00	$0.0010
PNM Resources	NM	11.0	7.8	7.9	1,445	$23.8	$2.17	$0.0022

Data on generation and emissions from:
Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States, M. J. Bradley & Associates, 2013.
CO_2 Emissions from Electricity Generation and Imports in the Regional Greenhouse Gas Initiative: 2011 Monitoring Report, RGGI, Inc., 2013.
i. New Jersey has since dropped out of the RGGI program
ii. Stack air pollutant emissions from corporate owned generation fleet
iii. Emission rates are calculated by dividing each company's total CO_2 emissions by its total generation.

As shown in Figure 1, this price per ton would typically add only a few mills per kWh – roughly 0.1 to 0.3 cents per kWh – to electricity rates.[23]

For example, in Public Service of New Mexico's service territory, given the 1,445 pounds per MWh carbon intensity of PNM Resources' mix, a $3.00/ton price would raise about $23 million each year for the State of New Mexico to administer, yet would raise electricity rates by only $0.0022/kWh, or about $1.32 per month for a residential customer that uses 600 kWh a month.

Similarly, in Southern Company's territory, with its carbon intensity of approximately 1,400 pounds per MWh, a $3.00/ton price would produce nearly $400 million to be shared proportionally between the states of Alabama, Georgia, Florida, and Mississippi to fund clean energy programs.[24] The ratepayer cost would be just $0.0021/kWh, or about $1.26 per month for a residential customer using 600 kWh a month.

These examples illustrate what a small price per ton can raise in the way of revenues for states to support clean energy programs to help them comply with 111(d). In each example considered, what appears as a small price and a small effect in rates is actually a substantial funding stream that could support the various policies that states might want or need to fund to meet compliance obligations or other purposes.[25]

While EPA has yet to produce draft 111(d) guidelines for existing plants, states should explore various models for developing their 111(d) equivalency plans, including an approach based on cap-and-invest. This approach has proven to be low-cost, readily implementable by adapting existing air compliance programs, and to provide states with significant flexibility to choose the clean

23. This assumes no adjustment for line losses, and that generation is used only to meet in-state load.
24. This assumes that state programs reflect emissions of in-state emitters and that proportional revenues resulting from the purchase of allowances by those emitters are used in-state. The Southern Company's operating companies include Alabama Power, Georgia Power, Gulf Power, Mississippi Power, and Southern Power.
25. While this is a small increase in rates, it is important to remember that the proper focus should be on customer bills. As customer usage goes down, so do customer bills.

energy policies for which they are best suited. For West Virginia and Kentucky, that might mean a combination of end-use and supply-side efficiency, combined heat and power, and a renewable resource mandate of some kind.[26] For New Mexico or Arizona it might mean thermal efficiency in buildings. In all states, it would mean a concrete plan coupled with steady funding.

If EPA acts favorably concerning the lessons learned in developing cap-and-invest, and allows states the flexibility under 111(d) to develop the clean energy side of their energy economies, states will be able to adopt reasonable, effective frameworks and embark on economically workable paths to addressing greenhouse gas emissions from their power sectors.

26. Kentucky identified the following clean energy strategies in its *Greenhouse Gas Policy Implications for Kentucky under Section 111(d) of the Clean Air Act*: demand-side energy efficiency; supply-side conservation or efficiency programs; transmission upgrades; renewable and other low-carbon energy projects at the affected source or at the consumer level; carbon capture and sequestration (CCS) technology; fuel switching to lower-emitting fuels; quantifiable and verifiable offsets; participation in regional or national market-based CO_2 credit-trading programs.