Should EPA Use Emissions Averaging or Cap and Trade to Implement §111(d) of the Clean Air Act?

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Fossil fuel-fired electric generating units (EGUs) account for 40% of the U.S. annual greenhouse gas (GHG) emissions. No federal regulations currently limit those releases. Two months ago, President Barack Obama ordered[1] the U.S. Environmental Protection Agency (EPA) to fill this gap by setting GHG emission limits for new EGUs under §111(b) of the Clean Air Act (CAA)[2] and for existing EGUs under §111(d).

The Administration has said very little about its §111(d) plans beyond setting a schedule for action.[3] But interest groups are already staking out their advocacy positions. Many of those positions reflect the familiar clash between proponents of GHG control and global warming deniers. But others reflect disagreements among control proponents over exactly how to act. There are two main contenders, called "cap and trade" and "emissions rate averaging."

Most remarkably, two leading control proponents—the Natural Resources Defense Council (NRDC) among environmental groups and the National Climate Coalition (NCC), an association of blue-chip companies—have endorsed emission rate averaging over cap and trade, even though it would be less legally defensible, could not encourage energy conservation or zero-carbon power nearly as much, and would be more complicated to administer.[4]

This sounds like an obscure, technical, and unimportant debate. This Article seeks to clarify those technicalities and convince the reader of their importance. It proceeds as follows: First, it describes the new source performance standards (NSPS) program and the overall §111(d) debate. Next, it sets out the two competing implementation approaches. Then, it compares and evaluates them, and ends with a brief conclusion.

I. EPA's Proposed NSPS

Section 111(b) requires EPA to set NSPS for emissions that "may reasonably be anticipated to endanger public health or welfare."[5] EPA must set those standards for selected source categories, and balance costs against emissions reductions when it sets them.[6]

A year-and-a-half ago, EPA proposed an NSPS for GHG emissions from all newly constructed fossil fuel-fired non-peaking EGUs.[7] EPA followed precedent in setting an emission limit for each separate new EGU. But it broke with most past practice in proposing the same emission standard for both gas-fired and coal-fired plants, namely 1,000 pounds of carbon dioxide equivalent (CO_2e) per megawatt/hour (MWh)—a standard only gas plants can meet.

The Obama memorandum directs EPA to repropose this standard by September 20, 2013.[8] The trade press reports that EPA may suggest separate standards for coal and gas plants. However, neither this shift nor any other probable change would be likely to affect the basic §111(d) issues, which we describe below.[9]

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1. 77 Fed. Reg. 39535 (July 1, 2013).
2. 42 U.S.C. §§7401-7671q, ELR Stat. CAA §§101-618.
3. Until recently, EPA denied it was developing a §111(d) standard. The Obama memorandum directing EPA to move forward says only that the Agency should consult widely, particularly with states, and should "develop approaches that allow the use of market based instruments, performance standards, and other regulatory flexibilities." Presidential Memorandum, Power Sector Carbon Pollution Standards 1(c)(iii) (June 25, 2013), *available at* http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards. However, the memorandum directs EPA to issue a §111(d) proposal by June 2014 and a final rule one year later. *Id.* at 1(b).
4. Daniel A. Lashof et al., Closing the Power Plant Carbon Pollution Loophole: Smart Ways the Clean Air Act Can Clean Up America's Biggest Climate Polluters (NRDC 2013), *available at* http://www.nrdc.org/air/pollution-standards/files/pollution-standards-report.pdf; National Climate Coalition, Using EPA Clean Air Act Authority to Build a Federal Framework for State Greenhouse Gas Reduction Programs (2013), *available at* http://www.ase.org/uploaded_files/temp/NCCNarrative.pdf.
5. CAA §111(b)(1)(A).
6. CAA §111(a)(1).
7. 77 Fed. Reg. 22392 (Apr. 13, 2012).
8. Presidential Memorandum, *supra* note 3, at 1(a).
9. Indeed, the NRDC's §111(d) proposal, which we discuss in critical detail, incorporates separate emission reduction calculations for coal and for gas plants.

II. Should §111(d) Regulate Each Individual Source or Sources Collectively?

Section 111(d) is most naturally read to require states to adopt existing source standards on the same pattern as the corresponding NSPS, though adjusted for the generally greater cost and lesser technical feasibility of controls on existing rather than new sources. This approach will not work for EPA's GHG proposal. Since there are no technically proven or economically viable add-on GHG controls for existing EGUs, existing EGUs cannot use technology to appreciably reduce their individual emissions. A coal unit would have to switch to gas to achieve that. Everyone agrees that no concievable §111(d) regulation could directly require such switching.

However, these problems get much smaller if §111(d) can be read to require emission reductions from the whole fleet of EGUs in a state, not from each EGU individually. Then, reductions in emissions per MWh from increased use of zero-carbon sources like wind, solar, and nuclear could be counted, as could reductions in emissions from lower electricity use due to conservation.

An academic cottage industry has explored this issue over the last few years, and has concluded that a fleet-based approach is entirely defensible.[10]

To summarize a complex argument that is somewhat peripheral to this Article:

- Nothing in the text of §111(d) actually requires source-by-source emission limits, either by clear statement or by implication;
- On the contrary, §111(d) calls on states to use a process "similar to" the implementation plans used to achieve air quality standards.[11] The CAA expressly allows such plans to rely on market mechanisms of collective emission control.[12]
- The second Bush Administration in its Clean Air Mercury Rule (CAMR) interpreted §111(d) to allow a market system of collective source regulation.[13] If the Obama Administration adopted the same view, that would create a consistent bipartisan endorsement of this approach, something that always makes regulations more defensible.

10. Inimai M. Chettiar & Jason A. Schwartz, The Road Ahead: EPA's Options and Obligations for Regulating Greenhouse Gases (Inst. for Policy Integrity, New York Univ. Law School 2009), *available at* http://policyintegrity.org/publications/detail/the-road-ahead/; Gregory E. Wannier et al., Prevailing Academic View on Compliance Flexibility Under §111 of the Clean Air Act (Resources for the Future 2009), *available at* http://www.rff.org/RFF/Documents/RFF-DP-11-29.pdf. I have taken part in this debate, reaching the same conclusion as the others. William F. Pedersen, *Use of CAA Section 111(d) to Control Carbon Emissions From Existing Utility Sources* (unpublished 2012).
11. CAA §111(d)(1).
12. CAA §110(b)(2)(A).
13. 70 Fed. Reg. 28606 (July 18, 2005).

III. The Two Competing Approaches to Fleet-Based Regulation

The two most discussed approaches to market regulation are cap and trade and rate-based averaging. We will describe each in turn.

A. *Cap and Trade*

A state using cap and trade for §111(d) would set a collective emissions "cap" of so many tons per year for all the non-peaking fossil EGUs within its borders. That cap would decline every year toward the number of tons that the regulated EGUs would emit if they all met the new source standard of 1,000 pounds (lbs.)/MWh. So, the emissions cap for a state, originally set at the emissions level actually reached in some baseline year—let us say 500,000 tons per year CO_2e—would gradually decline to a number like 250,000 tons per year.

To achieve this reduction, the state would issue and distribute each year "allowances" to emit GHG equal to the annual cap amount.[14] No EGU could emit without holding enough allowances to cover its emissions. A utility that emitted less than its share of the cap, perhaps because it relied heavily on wind or nuclear, could sell its allowances to a utility that emitted more than its share, perhaps because it relied on coal. Those whose GHG reduction costs were low would reduce their emissions and sell their allowances at a profit to those whose GHG reduction costs were high. Thus, cap and trade would work to reduce emissions at least cost.

Cap and trade automatically builds into its working the beneficial impact of zero-carbon generators and energy conservation. If fossil plant use declines for a given amount of electricity generation because zero-carbon sources are contributing more, the cap gets automatically easier to meet since the state EGU fleet emits less carbon for any given level of statewide electricity generation. Similarly, if use of fossil plants declines for a given level of economic activity because increased efficiency allows the state to produce more goods with less power, once again the cap gets easier to meet since the state EGU fleet emits less carbon for any given level of overall production.

B. *Emissions Rate Cap*

In the form put forward by the NRDC and the NCC, a rate cap would require all non-peaking fossil EGUs in the state to move gradually toward the new source emissions rate of 1,000 lbs./MWh. There would be no overall emissions cap. Instead, each source that emitted at more than the required rate would have to purchase credits to cover its shortfall. Those credits would be generated by sources that emitted at less than the required rate. They would be equal to the

14. The state would have full discretion on how to make this distribution. In the past, distributing them according to unit heat input has proved the course of least resistance, but more creative approaches are also possible.

amount by which the credit-generating sources' emissions rates were less than the 1,000 MWh target, multiplied by the number of MWh generated at that rate. A source that emitted 800 lbs./MWh would create 200 pounds of credits for each MWh it generated.

In concept, such a system could accommodate the contribution of non-fossil sources by allowing them to generate credits at an emissions rate of zero pounds of CO_2e per MWh generated, and could accommodate energy conservation measures by determining how many MWh they saved and crediting that amount, too, at the rate of zero pounds of CO_2e per MWh.

IV. Why Cap and Trade Is a Better Approach Than Rate-Based Averaging

Despite this rough conceptual equivalence, cap and trade is legally more defensible than rate-based averaging, better as policy, and more workable administratively.

A. *Cap and Trade Is Legally More Defensible*

Any thinkable §111(d) program must provide room for zero-carbon generators and conservation. Indeed, studies agree that for the next 10 years, increased energy efficiency holds more promise of reducing GHG emissions than any other approach.

The NRDC and the NCC therefore seek to include both approaches in their emission rate proposals. The NRDC states that under its approach, "covered units can reduce their emissions by increasing generation from renewable and other non-emitting plants."[15] The NRDC makes the same claim for electricity conservation.[16]

But such covered units are not really reducing "their" emissions, if those emissions are measured as pounds per MWh. They are claiming a credit for developments outside the fossil fleet that do not reduce fossil emissions per MWh at all. This is a significant legal problem. Section 111(d) standards must apply to the same set of sources as the corresponding §111(b) standard.[17] In this case, that would be non-peaking fossil EGUs. Yet, the NRDC approach would rely on emission reductions from *outside* that regulated category to ease the path to compliance, as well as relying on developments that do not reduce the emissions rates of fossil EGUs to meet an emissions standard stated as a fossil EGU emissions rate.

By contrast, if emissions are measured in tons per year generated by fossil-fired EGUs, as they are under cap and trade, zero-carbon generators and electricity conservation do in fact reduce fossil fleet emissions. They do this either by reducing the market share of fossil generators in meeting unchanged electricity demand, or by reducing that demand and reducing emissions in consequence.

One might oppose this distinction as an artifact of the design principles of the two systems, with no real-world significance. The "tons per year" metric that cap and trade uses automatically builds into the system the intensity of fleet utilization, while the "tons per MWh" metric that rate-based averaging uses does not.

But this misses the point. Both approaches are equally consistent with the text of the statute. Given that, the choice of approaches presents one of those cases, common in the law, where the way an issue is described may well determine the way the legal system judges it. Moreover, EPA in CAMR has *already* interpreted §111(d) to authorize a cap-and-trade approach, while it has *never* interpreted §111(d) to authorize rate-based averaging with attainment contributions from outside the regulated source category.[18]

Both §111(d) approaches arguably rest on somewhat expansive readings of the statutory language, though cap and trade holds an advantage on that point. But only one could point to a consistent, bipartisan history supporting that expansive interpretation.

B. *Cap and Trade Is Far Better Policy*

We measure the success of GHG regulation by the reduction in total GHG emissions that it achieves. Cap and trade acts directly to achieve that goal. As long as the cap is enforceable, the design of the system itself assures us of reductions.

But a rate-based system does not limit overall emissions. If demand for MWh increases enough, emissions can go up even if emissions per MWh go down. Further, a rate-based system, by its reliance on emission credits rather than a cap, makes including conservation, and, to a lesser extent, zero-carbon energy, much harder.

Basic economics tells us that consumers will economize their use of anything sold at a price. Accordingly, attention to efficient use has been built into the consumption of electricity since it first became a commercial product. That attention has intensified in recent years and is still intensifying.

Against that background, how should EPA credit conservation efforts as part of a GHG emissions control effort? Two problems in particular stand out.

First, quantifying the success of energy conservation measures depends heavily on detailed knowledge of the particular factory or building that makes those conserving changes. Such sources will have a natural motive to exaggerate the success of their efforts if by doing so they can generate valuable emissions credits. How could EPA counteract that tendency?

Second, if a §111(d) standard is really to reduce emissions below the trend line, it must reward only *new* emissions reduction efforts. NRDC responds by proposing to credit only energy conservation efforts that go beyond those implemented in a specified baseline year. That, of

15. Lashof et al., *supra* note 4, at 10.
16. Lashof et al., *supra* note 4, at 11.
17. CAA §111(d)(1).
18. EPA has once authorized rate-based averaging in an NSPS. *See* 40 C.F.R. §60.33b(d) (standards for municipal waste combustors). However, that standard only allowed the regulated sources to average among themselves.

course, creates the need to identify and quantify the conservation efforts undertaken in that year.[19]

It is probably easier to quantify the amount of zero-carbon electricity generated than to quantify electricity savings from energy conservation. But a rate-based approach still requires regulators to make this quantification, and to set a baseline to determine when credit granting starts.[20]

These problems do not arise with cap and trade. Instead, the more effectively conservation works, and the more zero-carbon generation is installed, the easier and less expensive it becomes to meet the emissions cap. Yet, there is no need to directly measure the contribution of these factors. And the judgment as to how much effort beyond the trend line to require is made generically, in establishing the rate at which the cap declines, thus avoiding the need for case-by-case judgments on the acceptability of individual projects.

In short, the choice between the two approaches looks very much like the choice facing a doctor deciding on a weight loss regime for a patient. She can either set a weight reduction target, and enforce it by weighing her patient weekly, or she can limit the patient's weekly calorie intake, but allow him to eat more if he compensates by a greater level of exercise. Cap and trade corresponds to the first approach; emission rate averaging with a credit for energy conservation corresponds to the second.

It is remarkable that the NRDC in particular should advocate rate-based approaches despite these problems. In the 1980s, the NRDC was the most eloquent critic of EPA's "bubble" policy—an early approach to market-based regulation—precisely because that approach created so many opportunities for inflated claims and placed such a burden on the regulators to determine which emission reductions really were surplus.[21] The NRDC largely dropped those objections when EPA turned to cap and trade. Yet today, the NRDC advocates rate-based averaging as though that earlier history did not exist.

C. *Complexity*

To have a chance of working in the long term, any regulatory system as sweeping as emission trading for existing fossil EGUs must be simple to operate.

Cap-and-trade systems for EGUs have been established by Congress in 1990 to implement the CAA acid rain provisions and repeatedly by EPA to achieve air quality standards. The intellectual problems with such systems have been resolved, and they have performed as designed in practice. The acid rain program has reduced emissions at far less cost than predicted, with minimal enforcement problems, and with an EPA implementing staff of 50 people.

There is no such track record for emissions rate averaging programs for EGUs. Nor has anyone devised an administratively simple way of building zero-carbon sources and energy conservation into their functioning, despite the obvious intellectual difficulties. Indeed, a rate-based approach inherently requires more government information demands than cap and trade, and more government decisions on the adequacy or inadequacy of private control efforts.

V. Conclusion

Given the overwhelming case on the merits for a cap-and-trade approach to §111(d), why have respected and sophisticated organizations endorsed an inferior approach? Pure politics seems to be the reason. The opponents of national global warming control legislation made such a target of "cap and trade" that they scared advocacy groups away from that approach, even though it is more consistent with limited government than rate-based averaging. That might make sense if an almost equally effective alternative approach were available. But there is no such alternative. Instead, by advocating a markedly inferior approach in the administrative process, where legal and policy weaknesses can be probed in detail and finally adjudicated by the courts, the proponents of this approach put the whole §111(d) project at risk. One hopes EPA will be wise enough not to listen to them.

19. By proposing to credit all energy conservation efforts implemented since the baseline, the NRDC proposal avoids a second logical problem with using emission credits for compliance, namely determining which of these post-baseline efforts were in fact "surplus" to what would have happened even without the §111(d) reduction rules. *See* Lashof et al., *supra* note 4, at 16.

20. The steps the NRDC recommends before a credit for energy conservation can be allowed give some idea of the administrative burden of their approach. Here is a selection of some of them.

B. Baseline/Surplus

- Energy savings used for compliance must be verified by the state or local energy regulator, and must be additional or surplus beyond a specified baseline.
- The baseline should be the average annual electricity savings from state and local programs, and codes and standards during the baseline period (e.g., 2008-2010) [citation omitted]. This level of savings should be assumed to continue in subsequent years in the baseline, and annual savings above that level would be eligible to create CO_2 compliance credits. This requirement ensures that compliance credit is given only for improvements in energy savings levels. Due to the dramatic growth in energy efficiency investments, this baseline will need to be revisited when the program is put into place.

C. Quantification/Permanence

- Qualifying energy savings must be quantified through transparent methodologies, must meet EPA-established guidelines, and must be independently verified.
- The state plan should provide for the administrators of energy efficiency programs approved by energy regulators to submit savings using measurement and verification processes that employ independent verification, and that are in compliance with EPA guidelines.
- The cost of measurement and verification requirements should be balanced with the value it provides by giving guidance on acceptable levels of uncertainty.

Lashof et al., *supra* note 4, at 16. *None* of these steps is necessary under cap and trade, as the judgment how much energy efficiency to rely on is made generically in setting the rate at which the cap declines.

21. *See* David D. Doniger, *The Bubble on the Cusp*, 4 Envtl. F. 29 (Mar. 1986).