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SAMUEL D. EISENBERG
Stanford University

MARTA R. DARBY
Stanford University

MICHAEL WARA
Stanford University

JOEL MINOR
Stanford University

ADELE C. MORRIS
Brookings

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Stanford University

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Stanford University

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EXECUTIVE SUMMARY

The economic literature supports the case that an emissions excise tax is one of the most cost-effective approaches to reducing greenhouse gas (GHG) emissions. The United States Environmental Protection Agency (EPA) has begun the process of regulating GHG emissions under section 111(d) of the Clean Air Act. Under this provision, EPA issues an emission guideline for states based on the agency's assessment of the best system of emission reduction (BSER) for a particular type of stationary air pollution source. States then develop compliance plans that include standards of performance for pollution sources that reflect the BSER and are consistent with the emission guideline. The states submit these compliance plans to EPA for approval. This paper walks through the legal framework to show that EPA can allow states to adopt a tax on carbon dioxide (CO_2) or other GHGs as a standard of performance. We also show that EPA can encourage this approach by providing the states with model tax levels and compliance schedules in its emission guideline. We conclude that a state-level carbon tax is a viable legal mechanism for cutting greenhouse gas emissions from power plants and other stationary sources under the Clean Air Act.

1. INTRODUCTION

The United States Environmental Protection Agency has begun the process of regulating greenhouse gas emissions using section 111 of the Clean Air Act (the Act).[1] This authority extends to both new and existing sources of emissions.[2] The agency's first rule for existing sources of emissions, under section 111(d) of the Act, will apply to power plants (also called electric generating units, or EGUs). Power plant emissions comprise about one-third of US GHG emissions. There are currently 1,611 existing facilities that could be affected by the rule.[3] The regulation could be one of the most economically significant rules ever promulgated. Subsequent rules will apply to other stationary sources[4] such as oil refineries, chemical plants, and other industrial facilities. To date, EPA has issued only a few rules under section 111(d), because most pollutants are covered under other provisions of the Clean Air Act.

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[1] *See* Executive Office of the President, Presidential Memorandum—Power Sector Carbon Pollution Standards (June 25, 2013) and *Massachusetts v E.P.A.*, 549 U.S. 497, 528 (2007). *See also American Electric Power Co., Inc. v. Connecticut*, 131 Sup. Ct. 2527, 2537-2538 (2011) (Precluding federal common law nuisance litigation because the appropriate means of regulating GHG from electric power plants is Section 111 of the Clean Air Act).

[2] EPA will regulate existing sources of GHGs under section 111(d) of the Act, and new stationary sources under section 111(b).

[3] 1611 power plants reported GHG emissions greater than 25,000 tons CO2e to EPA in 2012. EPA does not provide a breakdown of power plant emissions by technology (i.e., how many of these plants are coal-fired, combined cycle or singe cycle gas turbines). *See* U.S. EPA, Greenhouse Gas Reporting Program: 2012 Data Sets, *at* http://epa.gov/ghgreporting/ghgdata/2012data.html.

[4] I.e., sources other than vehicles, aircraft, locomotives, and other equipment that can be moved.

To regulate GHG emissions from existing power plants under section 111(d), EPA must complete several important steps, described below.[5] In some of these steps, EPA makes nationwide determinations. In other steps, states get to decide how to implement EPA's rules. Because the economic consequences of these rules are potentially very significant, it is useful to consider options that allow both EPA and the states to choose approaches that minimize the costs of achieving a particular emissions target.

Market-based instruments like a tax or a cap-and-trade system encourage cost-effective emissions reductions. Policies that charge emitters of GHGs in proportion to the damage caused by their emissions would create widespread market signals that would efficiently lower emissions throughout the economy over time. The price signals would shift consumer demand, drive new investment, and encourage technology development toward less emissions-intensive goods and services. Economists widely agree that a price on GHGs, and carbon dioxide in particular, is an important element in an economically efficient environmental policy portfolio. The simplest market-based approach is a carbon tax, an excise tax on the carbon content of fossil fuels, set as a dollar amount per metric ton of CO_2 that is emitted when the fuel is burned. A tax can also be imposed on other GHG emissions, scaled in terms of those gases' global warming potential equivalence to CO_2.

Given all the benefits of a carbon tax approach, the best outcome would be for Congress to set a well-designed carbon tax trajectory at the federal level. Morris and Mathur (2014) outline the policy design issues for such a policy and conclude that a modest, gradually escalating carbon excise tax would be workable and economically efficient, particularly if it is embedded in a broader fiscal reform that protects poor households, lowers the federal budget deficit, and lowers other taxes that burden the economy.[6] A federal carbon tax would incentivize emissions abatement equally across the economy, thereby preventing distortions in investment and emissions across state lines and source categories and encouraging the development of new clean technologies. Barring a policy change at the federal level, the question arises whether EPA can promote a cost-effective state-by-state approach by allowing states to adopt a carbon tax as a way to comply with their obligations under the forthcoming section 111(d) rules.

A state-level carbon tax approach to implementing section 111(d) would share many of the potential advantages of a federal carbon tax, as well as other potential economic benefits for the states. For example, some states have significant budget deficits that might otherwise be funded with more distortionary taxes. Other states have existing taxes, particularly those on

[5] 42 U.S.C. § 7411(d).
[6] Morris, Adele C. and Aparna Mathur, "A Carbon Tax in Broader U.S. Fiscal Reform: Design and Distributional Issues," Center for Climate and Energy Solutions, May 22, 2014.

business activities, that discourage investment and drive economic activity elsewhere. Implementing a carbon tax under 111(d) could offer a partial solution to these problems, for example, by enabling a pro-growth tax reform to fulfill environmental requirements. Further, the states could use some of their carbon tax revenues to bolster state-level social safety net programs that benefit the poor, thus offsetting the regressive impacts of carbon control on low-income households.

In this paper, we demonstrate that the Clean Air Act gives EPA the authority to approve state compliance plans that rely on carbon taxes as standards of performance under section 111(d). EPA can assist the states considering this route by determining what tax trajectory would be sufficient to achieve appropriate emission reductions and offering that specific compliance option to all states. Our goal here is to walk through the legal logic that supports our contention with an eye to showing EPA and stakeholders that some of the most cost effective policy options are indeed consistent with the Clean Air Act.

2. THE CLEAN AIR ACT SECTION 111(d) PROCESS

EPA's duty to regulate GHG emissions at existing power plants under 111(d) is triggered by the agency finalizing its rules for new power plants.[7] The full text of section 111(d) appears in the box below. To regulate existing sources of GHG emissions, EPA begins by issuing a set of requirements, or an "emission guideline," that states must satisfy. EPA establishes its emission guideline after evaluating the different technologies and policies that can reduce emissions and identifying a "best system of emission reductions," or BSER. The BSER does not have to be a particular emissions control device.[8] Instead, a BSER can be any approach that is adequately demonstrated, considering costs, energy requirements, and environmental impacts.[9]

[7] *See American Electric Power Co. Inc. et al. v. Connecticut et al.*, 131 S. Ct. 2527, 2537 (2011); EPA Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, Proposed Rule, 79 Fed. Reg.1430 (Jan. 8 2014). *See also* Jeremy M. Tarr, Jonas Monast & Tim Profeta, Nicholas Inst. for Envtl. Policy Solutions, Duke Univ., Regulating Carbon Dioxide under Section 111(d) of the Clean Air Act: Options, Limits, and Impacts (2013), http://nicholasinstitute.duke.edu/climate/policydesign/regulating-carbon-dioxide-under-section-111d.

[8] *See* Final Brief of Respondent EPA, *New Jersey v. EPA* [Clean Air Mercury Rule], D.C. Cir. No. 05-1097, 2007 WL 3231264, at 127-28 (Hereafter "EPA Brief").

[9] 42 U.S.C. § 7411(a)(1) (2006).

Once EPA has established the emission guideline, states must develop and implement compliance plans designed to achieve it. These plans must include "standards of performance" that reflect the BSER. EPA then reviews and approves each state's plan. If a state fails to submit a plan or if EPA finds a state compliance plan unsatisfactory, EPA can reject the state's plan and require revisions or impose a federal compliance plan.[10] In its emissions guideline, EPA lists each emission reduction system it finds to be adequately demonstrated, and the degree of emissions reductions achievable by those systems.[11] EPA will likely approve state plans that incorporate EPA's example systems and, in EPA's judgment, achieve the same reductions as the BSER.

Clean Air Act, 42 U.S.C. § 7411(d)

(d) Standards of performance for existing sources; remaining useful life of source

(1) The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 7410 of this title under which each State shall submit to the Administrator a plan which

(A) establishes standards of performance for any existing source for any air pollutant

(i) for which air quality criteria have not been issued or which is not included on a list published under section 7408 (a) of this title or emitted from a source category which is regulated under section 7412 of this title but

(ii) to which a standard of performance under this section would apply if such existing source were a new source, and

(B) provides for the implementation and enforcement of such standards of performance. Regulations of the Administrator under this paragraph shall permit the State in applying a standard of performance to any particular source under a plan submitted under this paragraph to take into consideration, among other factors, the remaining useful life of the existing source to which such standard applies.

(2) The Administrator shall have the same authority—

(A) to prescribe a plan for a State in cases where the State fails to submit a satisfactory plan as he would have under section 7410 (c) of this title in the case of failure to submit an implementation plan, and

(B) to enforce the provisions of such plan in cases where the State fails to enforce them as he would have under sections 7413 and 7414 of this title with respect to an implementation plan.

In promulgating a standard of performance under a plan prescribed under this paragraph, the Administrator shall take into consideration, among other factors, remaining useful lives of the sources in the category of sources to which such standard applies.

[10] 42 U.S.C. § 7411(d)(2); 7410(c). In practice, EPA sometimes issues a federal compliance plan along with the emission guidelines to help states in developing their own plans. *See, e.g.*, U.S. EPA, Standards of Performance New Stationary Sources and Emission Guidelines for Existing Sources: Large Municipal Waste Combustors, Final Rule, 71 Fed. Reg. 27,324 (May 10, 2006); U.S. EPA, Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606 (May 18, 2005) (Hereafter "CAMR").

[11] 40 C.F.R. § 60.22(b).

3. A CARBON TAX IS A STANDARD OF PERFORMANCE

In this section we show that EPA can approve a state compliance plan that imposes a state carbon tax as a standard of performance, so long as the emissions reductions it would produce are at least as environmentally protective as the emission guideline.[12] There are two basic requirements for a standard of performance under the Act, each of which must be met for EPA approval. A standard of performance must be:

1. "a standard for emissions of air pollutants which
2. reflects the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction and any non-air quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." [13]

We examine these two requirements in turn to show that a carbon tax can be a standard of performance—it creates an enforceable standard for GHG emissions based on accepted regulatory principles, and can be shown to achieve emission reductions equivalent to those achievable by whichever system EPA selects as the BSER.

A carbon tax is a standard for emissions.

The first requirement is that a standard of performance must be a "standard for emissions." A state carbon tax fits within the Supreme Court's approved definition of standard, and EPA has the authority to approve of market-based standards of performance.

A seven-justice majority of the Supreme Court explained the meaning of "standard" as used in the Clean Air Act in *Engine Manufacturers Ass'n v. South Coast Air Quality Management District*.[14] In that case, the Court considered purchase rules for large public and private vehicle fleets specified by an air pollution agency in Southern California. These rules required that fleet operators purchase only highly fuel-efficient vehicles, such as hybrids, for their vehicle fleets. The lower courts had held that those purchase rules did not violate a section of the Act that prevents state or local governments from setting vehicle emissions standards,[15] because the meaning of "standard" in that section was limited to "regulations that compel[led]

[12] 40 C.F.R. § 60.24(c).
[13] 42 U.S.C. § 7411(a)(1).
[14] 541 U.S. 246, 252-53 (2004).
[15] 42 U.S.C. § 7543(a) ("No State or any political subdivision thereof shall adopt or attempt to enforce any standard relating to the control of emissions from new motor vehicles or new motor vehicle engines subject to this part.").

manufacturers to meet specified emission limits."[16] The Supreme Court reversed the lower courts' decisions, holding that even though the rules did not specify a particular emissions rate and did not apply to manufacturers, they did constitute a means of coercion that, if widely implemented, would have effects similar to a traditional emissions rate limit on vehicle manufacturers.[17]

The Court explained that a "standard" is "that which 'is established by authority, custom, or general consent, as a model or example; criterion; test.'"[18] The key mistake of lower courts in interpreting "standard," was "engrafting…a mandate that requires that the vehicles…have particular emissions characteristics." The *Engine Manufacturers* Court interpreted "standard" as encompassing the multiple methods of regulation that appear throughout the mobile source provisions of the Clean Air Act. [19]

The Court's broad interpretation creates significant flexibility for EPA in promulgating carbon pollution standards under section 111(d). A carbon tax meets the definition of standard by establishing enforceable rules for GHG-emitting sources. State legislation enacting a carbon tax would establish rules for measurement, reporting, and payment. Just as the purchase rules under dispute in *Engine Manufacturers* constituted a standard by virtue of their economic effect on manufacturers, a carbon tax is a standard because it creates an economic incentive to reduce emissions.

Moreover, a standard of performance under section 111 encompasses market-based regulatory programs, including a carbon tax. "Standard of performance" is not limited to technological standards or numerical rates.[20] Changes in the 1990 Clean Air Act Amendments make clear that standards of performance need not be "technological" or "continuous" systems, as required prior to 1990.[21] Standards of performance also do need to be in the form of a numerical rate (i.e., tons/MWh).[22] For example, EPA approved of a cap-and-trade system under section 111(d) in the 2005 Clean Air Mercury Rule (CAMR), even though the rule did not

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[16] *Engine Manufacturers*, 541 U.S. at 252.
[17] *See id.* at 255-56.
[18] *Id.* at 252-53 (quoting *Webster's Second International Dictionary,* at 2455 (1945)).
[19] *Id.* at 253.
[20] *See* Final Brief of Respondent EPA, *New Jersey v. EPA* [Clean Air Mercury Rule], D.C. Cir. No. 05-1097, 2007 WL 3231264, at 127-28. Where a statute is ambiguous, a court will defer to the expert agency so long as the agency's interpretation is reasonable. *Chevron U.S.A., Inc. v. Natural Res. Def. Council, Inc.*, 467 U.S. 837 (1984).
[21] *Compare* 42 U.S.C. § 7411(a)(1) (1988), *with* 42 U.S.C. § 7411(a)(1) (2012) (removing "technological" and "continuous" from the definition of standard of performance for new and existing sources). *See also* Final Brief of Respondent EPA, *New Jersey v. EPA* [Clean Air Mercury Rule], D.C. Cir. No. 05-1097, 2007 WL 3231264, at 127-28.
[22] *See* EPA Brief at 122-29 (discussing why a cap-and-trade system is a permissible standard of performance); *cf. Engine Manufacturers*., 541 U.S. at 253 (discussing how standards for vehicle or engine emission characteristics under Title II standards may be met by emission limits, installation of equipment, or use of other design features).

specify a numeric rate for each source.[23] Although this rule was ultimately struck down by the D.C. Circuit for other reasons, it stands as an important example of the how EPA conceives of the scope of permissible economic incentive-based standards of performance under section 111(d).

To permit states to use a carbon tax as a standard of performance, EPA will have to amend its section 111(d) implementing regulations to clarify that emission taxes may be used to satisfy the statutory requirements.[24] EPA previously expanded its definition of "emission standards" in the regulations as part of the Clean Air Mercury Rule to encompass "allowance systems" such as cap-and-trade.[25] Because a carbon tax meets section 111(d)'s statutory requirements to be a "standard of performance," EPA can and should again update the definitions in its implementing regulations to include pollution taxes and other equivalent incentive-based systems. EPA should also clarify the implementing regulations to reflect section 111(d)'s command that it is "standards of performance" rather than "emissions standards" that must be included in state plans, and that standards of performance include those systems that meet the section 111(a) definition and reflect the BSER.

A carbon tax can reflect the degree of emission limitation achievable through the application of the best system of emission reduction.

The second requirement for standards is that a standard of performance must reflect the degree of emission limitation achievable by the BSER. [26] In other words, the standards of performance in a state compliance plan must reflect the level of emission reductions achieved by EPA's preferred method of pollution control, but need not implement the same system or type of system.

EPA and states can use economic models to show that a carbon tax set at a certain level or trajectory will likely result in a particular level of emission reductions (within a reasonable range of uncertainty) over a specified period of time. For example, electricity models can simulate the response of the power sector to demand, fuel costs, and other factors. These models incorporate details at the plant level, including heat rate, installed pollution controls, and

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[23] *See* EPA Brief at 124-25.

[24] *See* 40 C.F.R. § 60.24 (requiring that state compliance plans include "emission standards," which "shall either be based on an allowance system or prescribe allowable rates of emissions except when it is clearly impracticable"); *id.* § 60.21(f) (defining "emissions standard" as "a legally enforceable regulation setting forth an allowable rate of emissions into the atmosphere, establishing an allowance system, or prescribing equipment specifications for control of air pollution emissions").

[25] 70 Fed. Reg. 28,606, 28,649 (May 18, 2005) (amending 40 C.F.R. §§ 60.21, 60.24 by adding "allowance system(s)" language); *see also* 77 Fed. Reg. 9304 (Feb. 16, 2012) (Mercury and Air Toxics Standards (MATS) Rule) (amending 40 C.F.R. §§ 60.21, 60.24 but retaining allowance systems).

[26] 42 U.S.C. § 7411(a)(1).

transmission constraints, that drive dispatch decisions by grid operators.[27] They estimate the emissions response to a carbon tax or a cap-and-trade program by simulating the policy's effects on fuel prices, which will vary with the carbon intensity of each fuel, and the resulting shifts in production and consumption. The models project the effect of new fuel prices on fuel switching and other technology changes at the plants, subject to costs and any physical constraints in the electricity system, along with changes in electricity demand to estimate the overall effect of the policy on emissions. Similar models can make analogous projections for other GHG source categories.

EPA has long used such modeling in deciding how to set emissions limitations and in estimating the costs and benefits of its rules. For example, in the Cross-State Air Pollution Rule (CSAPR), EPA determined the amount of achievable emission reductions by calculating NO_X and SO_2 reduction cost curves.[28] These cost curves represented the emission reductions that would occur if states implemented every control measure available at each of several price levels.[29] EPA then determined the cost thresholds at which the statutory standard for preventing upwind state contributions to downwind state nonattainment was met, and allocated state budgets for tradable allowances based on the cost curves.[30] In essence, EPA's cost curves were modeling a pollution tax on power plants. In upholding the rule, a 6-2 majority of the Supreme Court approved EPA's use of costs as both an efficient and equitable means of allocating mandatory emission reductions.[31] The Clean Air Interstate Rule (CAIR), the predecessor to CSAPR, used a similar approach of computing cost curves and then allocating emissions allowances under a cap-and-trade system.[32] The earlier NO_x SIP Call rule also used model-derived cost curves.[33]

While a carbon tax does not set a numerical cap for emissions, a tax applied at the marginal abatement cost EPA uses to set the cap in a cap-and-trade system will result in the same expected level of emission reductions. In any of EPA's previous cap-and-trade programs, a tax rate equal to the estimated cost of abatement in the rule would have produced equivalent or

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[27] *See* U.S. EPA Clean Air Markets Division, Documentation for EPA Base Case v.5.13 Using the Integrated Planning Model, EPA #450R13002 (Nov. 2013), 2-2 – 2-5.
[28] Federal Implementation Plans: Interstate Transport of Fine Particulate Matter and Ozone and Correction of SIP Approvals, Final Rule, 76 Fed. Reg. 48,208, 48,248-52 (Aug. 8, 2011).
[29] *Id.*
[30] *Id.*
[31] *EPA v. EME Homer City Generation, L.P.*, 2014 S.Ct. ___ (Apr. 29, 2014), slip op. at 21-22, 25-28.
[32] Rule To Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_X SIP Call, Final Rule, 70 Fed. Reg. 25,162, 25,200, 25,278 (May 12, 2005).
[33] Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone; Rule [NO_X SIP Call], 63 Fed. Reg. 57,356 (Oct. 27, 1998) (determining cost effectiveness of emission reductions and then setting emission reduction budgets for NO_x).

greater expected reductions, and thus would "reflect" the same degree of emission limitation.[34] In fact, a tax can be preferable to a cap in this respect: a tax will always incentivize emission reductions, whereas an allowance cap based on, for example, an incorrect electricity demand forecast may fail to bind and thus not reduce emissions below business-as-usual levels.[35] Under the Acid Rain Trading Program and the NO_x Budget Trading Program, a tax equal to the cost of reductions EPA used to establish allowance budgets would have produced much greater emission reductions than those rules achieved using a budget-based approach. This is because emission reductions, hence allowance prices under both regulations turned out to be much lower cost than forecast. A tax imposed at the forecast allowance price would have driven emissions well below the cap. EPA approved cap-and-trade as a 111(d) standard of performance in the Clean Air Mercury Rule.[36] It can and should approve its mirror image—a tax set at the appropriate level to achieve any particular emission guideline.

Other Clean Air Act provisions support the conclusion that a carbon tax can be a standard of performance.

Section 111(d)'s reference to section 110 provides additional support for EPA's authority to approve a carbon tax as a standard of performance. In implementing section 111(d), EPA must use a "procedure similar to" that provided by section 110.[37] This is significant in two respects. First, it reinforces the division of labor in section 111 and EPA's implementing regulations, in which EPA determines the BSER and sets the emission guideline, and states establish standards of performance that reflect the BSER. Section 110, which governs state implementation plans for ambient air quality standards, limits EPA, in evaluating state implementation plans, to consider only whether the plans will achieve the required environmental objectives—not the means by which they do so. The means by which state implementation plans attain the NAAQS are left solely to the states.[38] The core of Supreme Court jurisprudence interpreting section 110 is this division of responsibility between EPA and the states.[39] The section 111(d) reference

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[34] *See* New Oxford Dictionary of English (1998) ("reflect" means to "embody or represent (something) in a faithful or appropriate way"); *see also* Dallas Burtraw and Sarah Jo Szambelan, US Emissions Markets for SO_2 and NO_x, RFF Discussion Paper 09-40 (2009).

[35] This is a common problem for greenhouse gas cap-and-trade programs. The caps set in RGGI phase I, EU ETS Phases I and II, and the AB 32 cap all appear to have been set above actual emissions levels. *See*, Lesley K. McAllister, The Overallocation Problem in Cap-and-Trade: Moving Towards Stringency, 43 Columbia Journal of Env. Law, 395 (2009).

[36] Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, Final Rule, 70 Fed. Reg. 28,606, 28,616 (May 18, 2005) (describing why a cap-and-trade program complies with the section 111(a) definition of "standard of performance). CAMR was vacated on other grounds in *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008).

[37] 42 U.S.C. § 7411(d)(1).

[38] *Id.* § 7410(a), (k)(3).

[39] *See Whitman v. Am. Trucking Ass'ns, Inc.*, 531 U.S. 457, 465, 470-471(2001) (contrasting EPA's mandate to set the NAAQS without regard to cost considerations with the states' ability to consider costs in implementing the NAAQS) ("It is to the States that the CAA assigns initial and primary responsibility for deciding what emissions

to section 110 is thus best interpreted as a strong signal from Congress that a similar structuring of responsibilities should occur under section 111(d) for existing source performance standards. States have substantial discretion to determine how they will achieve the environmental objectives that EPA sets in its emission guideline.

Second, section 110 requires that state implementation plans "include enforceable emission limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights), as well as schedules and timetables for compliance."[40] A carbon tax (or fee) is such an emissions control technique based on an economic incentive. While the reference to section 110 does not displace the substantive requirements of section 111(a) and (d), compliance with section 110 standards is an indication of the reasonableness of a carbon tax standard of performance.[41]

A carbon tax also meets the section 111(d) requirement that state compliance plans must establish standards of performance "for any existing source" in the category being regulated.[42] For example, all existing power plants could be covered by the state compliance plan establishing a carbon tax in the electricity sector. Each individual plant would face the same incentive to reduce carbon pollution and would be required to monitor GHG emissions and pay the specified tax for each ton of emissions.[43] While the actual abatement and costs incurred under a tax may vary across plants, the same would be true under any other standard of performance. For example, a rate-based standard would cap emissions rates for sources within a category, but the total emissions from the category would depend on the overall output of the sector.

In summary, EPA would be well within its legal authority and its past practice in approving a carbon tax as a standard of performance under section 111(d). Treating a state carbon tax as a standard of performance comports with the Supreme Court-approved definition of "standard," the Court's longstanding interpretation of the state and federal roles under the Clean Air Act, and previous EPA air regulatory practices in the CAMR and CSAPR rules.

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reductions will be required from which sources. . . . It would be impossible to perform that task intelligently without considering which abatement technologies are most efficient, and most economically feasible . . . .") (citing *Union Elec. Co. v. E.P.A.*, 427 U.S. 246, 266 (1976) ("Perhaps the most important forum for consideration of claims of economic and technological infeasibility is before the state agency formulating the implementation plan. So long as the national standards are met, the State may select whatever mix of control devices it desires . . . .")).

[40] 42 U.S.C. § 7410(a)(2)(A).

[41] *See* EPA Brief at 128-29 & n.48.

[42] 42 U.S.C. § 7411(d)(1)(A).

[43] *See* EPA Brief at 126-27 (describing how a CAMR cap-and-trade program applies to "any existing source").

4. EPA'S OPTIONS FOR ENABLING A STATE CARBON TAX APPROACH

The Clean Air Act gives EPA three main ways to offer states the option of adopting a carbon tax as a standard of performance. First, EPA can approve state compliance plans that include a carbon tax that modeling shows would reflect the emissions performance of EPA's BSER, whatever that BSER may be. EPA also has two other options: the agency can include a carbon tax reflecting the BSER as one of the adequately demonstrated systems in its emission guideline, giving the states a model tax to follow in their plans; or EPA could determine that a carbon tax is in itself the BSER.

EPA can approve state standards of performance that reflect the BSER.

As discussed above, a state may use a carbon tax as its standard of performance if the carbon tax reflects the degree of emission limitation achievable through the BSER.[44] The state may craft its carbon tax to reflect the BSER based on EPA's guidelines or its own energy and emissions modeling.

For example, if EPA bases its emission guideline on a cap-and-trade system, a carbon tax set at EPA's modeled marginal abatement cost would almost by definition reflect the degree of emission limitation in the guideline.[45] Similarly, if the emission guideline is an emission rate based on a power plant bolt-on post-combustion carbon capture and sequestration, a state could propose a carbon tax that it estimates would create the same GHG emission reductions as if each power plant in the state were fitted with the technology; a tax would have the added benefit of being simpler and more cost-effective. Because states can set a carbon tax at a price that in expectation achieves any given amount of GHG emission reduction, states can craft (and EPA can approve) carbon tax-based compliance plans that reflect the degree of emission limitation produced by whatever BSER EPA chooses in its emission guidelines.

EPA can list a carbon tax as an "adequately demonstrated system" in its emission guideline.

In its emission guideline, EPA describes not only the BSER, but also the various other systems of emission reduction that have been adequately demonstrated, including the degree of

[44] 42 U.S.C. § 7411(a)(1).

[45] While a tax will not give the same degree of certainty as to the final level of emissions as an equivalent cap-and-trade program, a well-designed tax based on the same marginal abatement cost projected for a cap-and-trade program would result in the implementation of the same control technologies and emission reductions strategies.

emission reduction each system can achieve.[46] EPA has the legal authority to include a carbon tax in its list of adequately demonstrated systems and make findings as to the level of a tax, compliance schedule, and other requirements that would ensure that a state carbon tax achieves emission reductions that reflect the BSER. Carbon taxes will induce firms to abate all emissions available at a cost no higher than the tax rate, because for any incremental abatement more costly than the tax, firms would find it more cost-effective to pay the tax. Thus, all EPA needs do is to determine the tax rate (or trajectory) equivalent to the marginal abatement cost imposed by the BSER on a covered source category. EPA will most likely already have the information needed to do so from its calculation of the cost of a technology-based BSER or from the cost curves used to craft a cap-and-trade BSER.

A carbon tax program is a "system" of emission reduction.[47] Moreover, a carbon tax can produce emission reductions that "reflect the degree of emission limitation" of the BSER by creating a market-based incentive for sources to reduce GHG emissions equivalent to it. EPA may determine that a carbon tax has been "adequately demonstrated" by reference to economic models; existing taxes on GHG emissions or other pollutants; existing equivalent cap-and-trade programs, including cap-and-trade programs with a price floor; and the demonstrated components of a carbon tax regime, such as GHG emission monitoring and an existing state excise tax system.[48]

EPA can determine that a carbon tax <u>is</u> the BSER.

EPA may also specify in its emission guideline that a carbon tax is the BSER. To do so, the agency would have to determine that a tax is the system of emission reduction that is both "best" and "adequately demonstrated." These determinations are the province of EPA's technical expertise, and thus entitled to deference from a court reviewing EPA's decision.[49]

EPA determines which system of emission reduction is "best" in its emission guideline documents.[50] In making that determination, EPA has the authority under section 111 to take

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[46] 40 C.F.R. § 60.22(b)(2)-(3).

[47] A "system" is "a complex unity formed of many often diverse parts subject to a common plan or serving a common purpose." *Webster's Third New International Dictionary*, at 2322 (1967); *see* EPA Brief at 125 (cap-and-trade constitutes a system under that definition). A system of emission reduction need not be technological.

[48] EPA may rely on economic models in its section 111 rulemakings. *See Sierra Club v. Costle*, 657 F.2d 298, 332-334 (D.C. Cir., 1981). EPA may also rely on successful carbon tax programs such as the British Columbia Carbon Tax Act. *See* British Columbia Ministry of Finance, Carbon Tax Review (2013). Greenhouse gas emissions monitoring is already required for proposed NSPS source categories under the Mandatory Greenhouse Gas Reporting Rule. *See,* US EPA, Mandatory Reporting of Greenhouse Gases, 74 Fed. Reg. 56,260 (Oct. 30, 2009).

[49] *See, e.g.*, *Chevron*, 467 U.S. at 842-43; *Sierra Club v. Costle*, 657 F.2d 298, 330 (D.C. Cir. 1981); *National Asphalt Pavement Ass'n v. Train*, 539 F. 2d 775, 786 (D.C. Cir. 1976); *Ethyl Corp. v. EPA*, 541 F.2d 1, 67 (D.C. Cir. 1976) (Bazelon, C.J., concurring).

[50] 40 C.F.R. § 60.22(b)(5).

into account the costs of the system, as well as energy requirements and environmental impacts.[51] The D.C. Circuit, in reviewing previous New Source Performance Standards, has stated that "[t]he language of section 111 . . . gives EPA authority when determining the best technological system to weigh cost, energy, and environmental impacts in the broadest sense at the national and regional levels and over time . . ."[52] The economic efficiency of a carbon tax and its simplicity and feasibility compared to other possible GHG emission reduction systems may well make a carbon tax the best system available. On the other hand, the need to modify state tax law in order to implement this strategy may cause EPA to select an alternative approach as its BSER for carbon pollution standards, even though the agency finds that a carbon tax could achieve the same level of emission reductions. Even if this is the case, as discussed above, EPA could still specify in its emission guideline the model tax approach that the agency finds would be equivalent to the BSER.

5. CONCLUSION

An appropriately designed carbon tax can meet the statutory requirements to be a standard of performance for implementing EPA's section 111(d) regulation of GHG emissions. A carbon tax is a "standard for emissions" that causes emission reductions. A carbon tax can be designed so that it achieves the desired level of reductions specified by EPA using methodology similar to that approved by the agency in earlier rules that employed market-based approaches. EPA can help states that want to use carbon taxes by doing two things. First, the agency can issue a national emission guideline that acknowledges that a carbon tax is an adequately demonstrated system of emission reduction, and second, EPA can specify how states can structure their tax to achieve emission reductions that reflect those of EPA's BSER. EPA may also determine that an appropriately designed carbon tax is in fact the BSER. Thus, EPA is within its legal authority under the Clean Air Act to provide for carbon taxes in either its emission guideline or in approval of state compliance plans for GHG emissions from existing sources.

Regardless of how much guidance EPA initially provides to the states regarding carbon taxes, states may use carbon tax-based standards of performance that are crafted to reflect the reductions required by EPA's emission guideline. Ultimately, section 111(d), like other parts of the Clean Air Act, provides significant discretion to states to propose pollution reduction strategies tailored to fit their unique facts and circumstances so long as those strategies achieve reduction goals set by EPA. The inherent flexibility of a carbon tax allows states to tailor the approach to suit their needs as they achieve the reduction targets set by the federal government.

[51] 42 U.S.C. § 7411(a)(1); 40 C.F.R. § 60.22(b)(5).
[52] *Costle*, 657 F.2d at 330.

THE BROOKINGS INSTITUTION
1775 MASSACHUSETTS AVE., NW
WASHINGTON, DC 20036
WWW.BROOKINGS.EDU