Institute *for* Policy Integrity

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December 1, 2011

Office of Information and Regulatory Affairs
Attn: Cass Sunstein, Administrator
Dominic Mancini, Branch Chief
Cc: Christian Fellner and Brian Shrager, Office of Air and Radiation
Environmental Protection Agency

Subject: Comments on EPA's Forthcoming Greenhouse Gas New Source Performance Standards for Electric Utility Steam Generating Units

The Institute for Policy Integrity respectfully submits the following comments on the Environmental Protection Agency's ("EPA") forthcoming New Source Performance Standards ("NSPS") for greenhouse gas ("GHG") emissions from new and existing fossil fuel-fired power plants under § 111 of the Clean Air Act.

The Institute for Policy Integrity at New York University School of Law is a non-partisan think tank dedicated to improving the quality of government decisionmaking through advocacy and scholarship in the fields of administrative law, economics, and public policy.

EPA is under a court-ordered deadline to issue New Source Performance Standards for fossil fuel-fired power plants.[1] EPA's proposed rule was recently transmitted to the Office of Information and Regulatory Affairs for review.[2]

The forthcoming regulation will be an important step forward in addressing climate change and protecting public health and welfare. EPA should adopt the following policy options to ensure that its final regulation comes as close as possible to maximizing overall benefits:

- EPA should regulate existing sources under § 111(d) and should determine the standards for new and existing sources at the same time.
- EPA should establish NSPS for natural gas-fired power plants as well as coal-fired power plants.
- EPA should include flexible compliance mechanisms in its final rule.

[1] Under 42 U.S.C. § 7411(b), EPA is compelled to list categories of sources that, in the Administrator's judgment, "cause[], or contribute[] significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare." Once a category is listed, EPA must publish a "standard of performance" for all new and modified sources in that category. The standard is defined as the "best system" of emission reduction, taking into account cost, which has been adequately demonstrated. 42 U.S.C. § 7411(a)(1). For existing sources, § 111(d) mandates a cooperative federal-state process, "similar to that provided by section 110," whereby EPA establishes minimum "emissions guidelines" and then each state uses the guidelines to inform their state plan establishing "standards of performance" for existing in-state sources. 42 U.S.C. § 7411(d). Under the terms of an outstanding settlement agreement, EPA is required to issue an NSPS on GHG emissions from fossil fuel-fired power plants. *See* Order of Sept. 24, 2007, New York v. EPA, No. 06-1322 (D.C. Cir. 2007); EPA, *Addressing Greenhouse Gas Emissions,* http://www.epa.gov/airquality/ghgsettlement.html.

[2] *See* Office of Information and Regulatory Affairs, *Pending EO 12866 Regulatory Review of RIN 2060-AQ91*, http://www.reginfo.gov/public/do/eoDetails?rrid=121173 (updated Nov. 7, 2011).

- EPA should set the NSPS based on a cost-benefit analysis.
- The § 111(d) guidelines should allow states broad latitude in designing "equivalent" regulatory programs.
- EPA should commit to an automatic phase-in of stronger standards.

I. EPA should regulate existing sources under § 111(d) and should determine the standards for new and existing sources at the same time.

Grandfathering existing sources typically creates incentives to keep existing plants in operation longer than is economically efficient. The inefficiency is greatest when the difference between old and new source standards is largest and when the differential standards are in place longest—which precisely reflects the history of grandfathering under the Clean Air Act. EPA should not fully, permanently grandfather existing sources[3] and should issue § 111(d) emissions guidelines for state regulation of existing sources alongside its standards for new sources. EPA should simultaneously determine the standards for existing and new sources in order to design the most efficient overall regulatory program.

EPA should not fully, permanently grandfather existing sources.

EPA should design a scheme that allows for the most efficient retirement of old facilities. Different combinations of standards under § 111(b) and (d) will create different incentives for owners of existing and new facilities. Full, permanent grandfathering will not achieve the optimal level of plant retirement and new construction,[4] and therefore EPA should issue a standard for existing sources under § 111(d) that creates incentives to optimize plant retirement decisions.

The critical concern for grandfathering is the "old plant effect," in which existing facilities stay in operation longer than is optimal under an efficient pollution-pricing scheme. Differential standards for new and existing plants distort the economic analysis that plant owners undertake when deciding whether to build a new plant or to continue operating the existing one.[5] New construction becomes relatively more expensive (and keeping an older plant in operation becomes relatively cheaper) than it would be if the level of regulation were consistent across all plants. These problematic incentives create an old plant effect, keeping existing plants running and delaying the timely closure of old, inefficient facilities.[6]

The old plant effect is more pronounced when the difference between standards for new and existing sources is larger, and when the differential standards are in place longer.[7] Across-the-

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[3] "Fully" refers to the degree of regulation of existing sources as compared to new sources: full grandfathering excludes old sources from any standards, while partial grandfathering would impose some standard (but less stringent than the new source standard). "Permanently" refers to the length of time that grandfathering remains in effect; the alternative would be a temporary exemption or phased-in standards for existing sources.

[4] The only situation in which full, indefinite grandfathering of existing sources would be appropriate is if even an optimal carbon price (taking into account the full social costs) would not change the existing source owners' behavior at any point during the lifespan of the source. This is an extraordinarily rare scenario, and for all practical purposes it does not exist in the real world. Even if an optimal price would not immediately affect business decisions at the plant, at some point the rising costs of maintenance and upkeep would undoubtedly become unprofitable when compared to the carbon price. The improbability of this scenario underscores the notion that full, indefinite grandfathering is inappropriate here.

[5] Jonathan Remy Nash & Richard L. Revesz, *Grandfathering and Environmental Regulation: The Law and Economics of New Source Review*, 101 NW. U. L. REV. 1677 (2007); *see also* Garth Heutel, *Plant Vintages, Grandfathering, and Environmental Policy*, 61 J. ENVTL. ECON. & MGMT. 36 (2010).

[6] Nash & Revesz, *supra* note 5, at 1708.

[7] *Id.*

board, permanent grandfathering of existing power plants is therefore highly inefficient, as it maximizes the difference between the standards and the length of time that such differential standards will remain in place.

Moreover, the old plant effect is likely to be weakest when regulated facilities cannot continue operating for a long lifespan. (In those cases, turnover from old to new plants happens more quickly and the impacts of grandfathering are more limited.) Here, where plant lifespans are measured in decades, the old plant effect is likely to be particularly powerful.[8]

In addition to the old plant effect, the Clean Air Act's New Source Review provisions create a "significant improvement effect." Since New Source Review is triggered by significant modifications,[9] differential standards for modified and non-modified plants will cause existing plants to make large modifications less frequently than is optimal.[10] This adds a second barrier to new construction and investment in up-to-date power plant facilities. EPA should avoid reinforcing the Clean Air Act's existing barriers to socially optimal investment decisions.

Empirical analyses confirm the existence of an "old plant effect." Multiple sources have found that grandfathering of existing sources leads to delays in facility closures. Maloney and Brady assessed the effect of sulfur dioxide emissions trading restrictions that resulted in grandfathering, finding delays in capital retirement of 8% for every doubling in the stringency of the new source regulations.[11] Similarly, Gruenspecht's early study of grandfathering provisions for mobile sources found that the scheme "prolong[ed] the retention of old, high-emission-rate vehicles in the fleet."[12] Stavins confirmed this effect more recently by surveying a range of studies of differentiated regulations for motor vehicles, finding that the rules led to lower new car sales and extended operation of used cars.[13] Nelson et al., despite critiquing the results of other analyses, found that differential regulation led to an increase in the age of capital in the electric utility industry by an average of 3.3 years.[14] Bushnell and Wolfram empirically confirmed that grandfathering made plants much less likely to retire, as long as the level of regulation did not vary within the plants' geographic region.[15] As expected, empirical observations by List et al. have confirmed that grandfathering also induces plant owners to delay plant modification.[16]

Many studies have found that age of capital (plant life) and emissions rates are positively correlated.[17] Most of these analyses—both theoretical and empirical—compare emissions under grandfathering to a no-regulation alternative and arrive at the perverse result that regulation of new sources with grandfathering may lead to *higher* emissions than would occur in the absence of

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[8] *See* Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief*, NW. U. L. REV. (forthcoming 2012). An earlier version of the article is available at Richard L. Revesz & Allison L. Westfahl Kong, *Regulatory Change and Optimal Transition Relief* (Institute for Policy Integrity, Working Paper No. 2010/2, 2010). *See also* Howard K. Gruenspecht, *Differentiated Regulation: The Case of Auto Emissions Standards*, 72 AM. ECON. REV. 328 (1982).

[9] *See* 40 C.F.R. § 52.24(f)(6).

[10] *See* Nash & Revesz, *supra* note 5, at 1713-14.

[11] Michael T. Maloney & Gordon L. Brady, *Capital Turnover and Marketable Pollution Rights*, 31 J. L. & ECON. 203 (1988).

[12] Gruenspecht, *supra* note 8.

[13] *See* Robert N. Stavins, *Vintage-Differentiated Environmental Regulation*, 25 STAN. ENVTL. L.J. 29 (2006).

[14] Randy A. Nelson, Tom Tietenberg & Michael R. Donihue, *Differential Environmental Regulation: Effects on Electric Utility Capital Turnover and Emissions*, 75 REV. ECON. & STAT. 368, 373 (1993).

[15] *See* James B. Bushnell & Catherine Wolfram, *The Economic Effects of Vintage Differentiated Regulations: The Case of New Source Review* (Center for the Study of Energy Markets, Working Paper, 2006).

[16] John List, Daniel Millimet & Warren McHone, *The Unintended Disincentive in the Clean Air Act*, 4 ADVANCES IN ECON. ANALYSIS & POLICY, Article 2 (2004).

[17] *See* Heutel, *supra* note 5; Gruenspecht, *supra* note 8; Maloney & Brady, *supra* note 11.

any regulation. Maloney and Brady's study found that grandfathering led to an increase in sulfur dioxide emissions as compared to no regulation, with emissions rates up to 27% higher in states with the strongest grandfathering incentives.[18] McKitrick demonstrated that grandfathering in the Clean Air Act led to greater overall emissions in the near term and curtailed the beneficial effects of technological improvements required for new sources over the long term.[19] On the other hand, Nelson et al. found that emissions remained constant despite an increase in the age of capital, but attributed this result to the scarcity of technological improvements in sulfur dioxide emissions abatement.[20] List et al., while withholding a final conclusion, noted that their study of plant closures outside the electric utility industry "suggests the possibility that in the short run [grandfathering] has led to *more*, rather than less, pollution."[21]

Further, grandfathering discourages the owners of existing sources from anticipating future legal changes.[22] Regulated entities have had ample warning of future regulation in the case of climate change, which has commanded scientific concern and legislative attention for decades[23] and faced certain federal regulation for several years.[24] Grandfathering existing sources would set a poor precedent by failing to reward early actors who have already taken measures to address GHG emissions at their existing plants. And it would continue to withhold a significant incentive for all owners to begin modernizing their existing facilities.

Even partial, temporary grandfathering creates incentives for strategic public choice behavior by regulated entities, which can lead to socially inefficient outcomes over time.[25] Past administrations have repeatedly expanded the scope and timeframe of grandfathering as a result of pressure from regulated industries.[26] Including even limited grandfathering in the NSPS rule may incentivize regulated entities to try to extend the grandfathering period indefinitely, as they have done in the past with substantial success.[27]

However, temporary, partial grandfathering may be appropriate in certain limited circumstances. One aspect is timing: EPA must determine when an existing source standard under § 111(d) would go into effect (although this sort of timing question is not commonly known as grandfathering, and is commonly considered for any rulemaking). In these circumstances, EPA may find that the capital investment requirements for existing sources merit a certain transition period.

Similarly, EPA may find that existing sources should not be held to the same standard as new sources. The optimal level of abatement investments for plant owners constructing a new facility

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[18] Maloney & Brady, *supra* note 11, at 204.

[19] Ross McKitrick, *Why Did US Air Pollution Decline After 1970?*, 33 EMPIRICAL ECON. 491 (2007).

[20] *See* Nelson, Tietenberg & Donihue, *supra* note 14.

[21] *See* List, Millimet & McHone, *supra* note 16.

[22] *See* Revesz & Kong, *supra* note 8.

[23] *See* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC FIRST ASSESSMENT REPORT (1990), *available at* http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml.

[24] *See* Massachusetts v. EPA, 549 U.S. 497 (2007).

[25] Nash & Revesz, *supra* note 5, at 1729–30; Revesz & Kong, *supra* note 8, at 66.

[26] *See generally* Nash & Revesz, *supra note 5,* at 1681-1705, discussing the numerous changes and iterations of New Source Review in the Clean Air Act, including: 1977 CAA amendments, which introduced PSD and NA-NSR provisions, further entrenching the two-tiered approach; 1980 EPA NSR rules, which defined 'major modification' for purposes of NSR and retained the routine maintenance exemption; 1981 rules expanding the 'bubble' concept; 1996 proposed reform rule, which was stalled and ultimately scrapped; 2002 NSR rules, which changed baseline determinations (10-year lookback rather than 2-year; actual-to-projected-actual test rather than actual-to-potential; demand growth exclusion) for purposes of triggering NSR; and 2003 Routine Maintenance, Repair, and Replacement rules, allowing changes up to 20% of plant value (vacated in 2006 by the D.C. Circuit).

[27] Revesz & Kong, *supra* note 8, at 67–72.

could be higher than for owners of existing facilities, as retrofitting is often more expensive than new construction per unit of abatement. Thus, EPA could conclude that the optimal § 111(d) standard for emissions should be less stringent than the § 111(b) standard. This makes perfect sense when considering that the "old plant" effect refers to *sub-optimal* plant retirement decisions; an *optimal* plant retirement decision may not require identical standards for new and existing sources nor immediate compliance for existing sources.[28] But EPA should also consider the risks of strategic behavior by existing source owners described above, which diminish as the level of grandfathering decreases.

By extending plant life, delaying new construction, discouraging anticipation of future legal changes, and encouraging strategic public choice behavior, grandfathering creates a host of problematic incentives and can lead to *greater* overall emissions than an absence of regulation entirely. EPA should design an NSPS rule that incentivizes efficient plant retirement decisions and avoids the old plant effect.

EPA should determine standards for new and existing sources at the same time.

A regulator of new and existing sources cannot achieve an optimal regulatory outcome unless the standards are determined in a coordinated fashion.[29] EPA should therefore evaluate and design its new and existing source standards jointly. Developing the two programs jointly will yield a more efficient overall outcome than the sequential approach typically presented in academic literature, in which a regulator first picks an optimal standard for new sources, and then chooses the optimal transition rule for existing sources in light of the new source standard.[30]

For a highly simplified illustration, assume that a regulator first selects the socially optimal standard for new sources, by comparing costs and benefits for new sources and picking the regulatory alternative that maximizes net benefits. Then the regulator turns to the decision of how to regulate existing sources. Again, to pick the socially optimal standard, the regulator would find the alternative that maximizes net benefits. Since existing sources face different costs and are capable of generating different benefits compared to new sources, it may appear that the socially optimal standard for existing sources is some degree of grandfathering—that is, what maximizes net benefits for existing sources may be a standard substantially less stringent or more delayed than the new source standard.[31] Though this choice appears optimal when sources are regulated sequentially, it replicates all the problems of the old plant effect and interferes with the efficient retirement of aging plants. If the disparity between standards is great enough, existing sources may continue operating indefinitely rather than incur the high regulatory costs of new construction: if

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[28] *See id*.

[29] *Id.* at 49–57.

[30] *See* Louis Kaplow, *An Economic Analysis of Legal Transitions*, 99 HARV. L. REV. 509, 521 (1986); Steven Shavell, *On Optimal Legal Change, Past Behavior, and Grandfathering*, 37 J. LEGAL STUD. 37, 48 (2008).

[31] The following example is adapted from the academic literature. An existing source produces a 7% risk of harm of $700,000, yielding an expected cost of $49,000. The optimal standard for a new source is a 5% level of risk (yielding an expected harm of $35,000), but it would cost $20,000 for the existing source to purchase the technology necessary to reduce risk to this level. In this instance, forcing the existing source to meet the same standard yields an overall social cost of $55,000 ($20,000 for the technology and $35,000 for the expected harm at a 5% level of risk). A regulator setting the existing source standard would then conclude that grandfathering is optimal, as it will lead to an overall social cost of $49,000. However, suppose that the regulator picks a slightly less stringent new source standard that would reduce risk to 5.5%, but the cost to install this technology is $10,000. Then it is optimal to not grandfather, since the social cost of requiring the existing source to meet this standard is $10,000 + 5.5% x $700,000 = $48,500, which is lower than the cost of operating the old plant as is. Setting the new source standard jointly with the existing source standard allows the regulator to achieve a more optimal outcome. *See* Revesz & Kong , *supra* note 8, at 54–55.

no old plants are replaced with newer models, the new source standard will essentially exist only on paper.[32]

Now instead assume that the regulator tries to select the optimal standards for both new and existing sources at the same time. Under this joint approach, the regulator is able to consider the full range of regulatory effects, including how a disparity between new source and existing source standards will affect retirement decisions. The regulator may find that, instead of setting a new source standard at the "optimal" level by considering just the benefits and costs for new sources, selecting a less stringent rule that is closer to the existing source standard may ultimately achieve greater net benefits overall. Similarly, selecting a more stringent rule for existing sources that is closer to the new source standard—though it may raise costs for existing sources in the short run—may increase net social benefits in the long run. By using this joint approach to minimize the disparity between standards, the regulator may be able to encourage more efficient plant retirements and may consequently achieve either greater overall emissions reductions at the same cost or the same emissions reductions at a lower overall cost.

EPA should examine and evaluate the empirical literature on the effect of existing source regulation on emissions. While many studies to date have examined the effect of regulation with grandfathering versus a baseline of no regulation, fewer studies have compared the efficiency and emissions outcomes of more stringent regulation of new sources paired with grandfathering versus weaker regulation of new sources with regulation of existing sources. Assessing the current state of the literature would inform EPA's efforts to establish an appropriate regulatory scheme for new and existing power plants under § 111.

Particularly in the electric utility industry, where sources can operate for decades and growth in demand is steady but fairly limited, EPA should not allow full, permanent grandfathering of existing sources.[33] As demonstrated empirically, strict regulatory schemes for new sources alone may not necessarily lead to environmental improvements.[34] By jointly setting new and existing source standards, EPA can optimize the regulatory regime: it may achieve greater emissions reductions at the same cost or achieve the same emissions reductions at a lower cost than by following the past practice of enacting strict new source standards with full grandfathering. This decisionmaking process will ensure that the overall regulatory regime offers optimal incentives for the timely retirement of older plants.[35]

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[32] *Id.* at 51 ("[T]he current approach to determining the desirability of grandfathering is seriously flawed. It does not take into account the impact that the disparity between the regulatory stringency that applies to new sources and grandfathered sources has on the rate at which grandfathered sources close down and are replaced by new sources. If this disparity is too great because the new source standards are far more stringent than the standards applying to grandfathered sources, grandfathered sources will continue operating for a longer time than they would in the absence of the stringent new source regulations. Then, there will not be demand for new sources and the stringent standard will exist only on paper; there will be no sources to which it actually applies, while the grandfathered standards would persist for a long time.").

[33] *Id*.

[34] McKitrick, *supra* note 19, at 511 ("'Tough' is not equivalent to 'effective' environmental regulation. . . . Providing a legal and economic milieu which encourages decentralized innovation and technological change in pollution control is key.").

[35] Revesz & Kong, *supra* note 8, at 49–57.

II. EPA should establish NSPS for natural gas-fired power plants as well as coal-fired power plants.

The significant proportion of GHG emissions from natural gas sources and the infrequency of new coal-fired power plant construction strongly suggest that EPA should include natural gas power plants in the NSPS rulemaking. Natural gas plants are still being built, while construction of new coal-fired plants has stalled.[36] Not including natural gas means that the NSPS will have a limited effect, as it will cover vastly fewer sources. While natural gas power plants have lower GHG emissions rates as compared to coal, the plants are still a substantial source (nearly one quarter) of GHG emissions from the U.S. energy sector.[37]

No new coal plants were built in the United States in 2009 or 2010.[38] In contrast, natural gas plants are projected to account for 60% of the capacity additions to U.S. electricity generation over the next 25 years.[39] While recent forecasts of U.S. electricity generation predict that coal will remain the principal source of electricity generation and that generation from coal will increase, that growth will come almost entirely from increased generation from existing capacity.[40]

Further, if EPA pursues flexible compliance mechanisms (see *infra* Part III), increasing the diversity of GHG sources within the potential trading pool will expand the availability of cost-effective emissions trades. As a result, incorporating natural gas-fired power plants into the current NSPS rulemaking will increase the emissions reductions possible from the NSPS while also reducing the cost of achieving those reductions, provided that EPA includes trading mechanisms in the rule.

Moreover, EPA may be legally obligated to regulate natural gas power plants under the NSPS provisions, given that it has listed natural gas power plants for other pollutants that endanger public health or welfare. For instance, EPA set standards for NO_x from electric generating natural gas turbines and several similar source categories.[41] The text of § 111(f)(2) requires EPA to consider "the quantity of air pollutant emissions" in each category and "the extent to which each such pollutant" may endanger public health and welfare.[42] The text does not limit EPA to pollutants it has already regulated. Given that EPA is required to review NSPS at least every eight years,[43] this indicates an affirmative responsibility to issue NSPS for any pollutant from already-listed categories of sources and would compel EPA to include natural gas power plants in this rule. EPA has declared that its statutory mandate under § 111(f) is limited to already-regulated pollutants.[44] Yet the text indicates otherwise.[45] In light of this potential legal obligation and the significant emissions reduction opportunities, EPA should include natural gas sources in this rulemaking.

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[36] *See* U.S. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK (2011) [hereinafter ANNUAL ENERGY OUTLOOK].

[37] In 2009, natural gas plants accounted for 22.4% of GHG emissions from the energy sector. By comparison, coal plants accounted for 34.6% of GHG emissions. *Id.* at 150, Table A18.

[38] *See* Steven Mufson, *Coal's Burnout*, WASH. POST, Jan. 2, 2011, http://www.washingtonpost.com/wp-dyn/content/article/2010/12/31/AR2010123104110.html.

[39] ANNUAL ENERGY OUTLOOK, *supra* note 36, at 74. Coal-fired plants will represent just 11% of the capacity increase over the same period, according to the EIA. *Id.*

[40] *Id.*

[41] *See* Nitrogen Oxide Emission Limits for New Stationary Combustion Turbines, 40 C.F.R. pt. 60, Subpt. KKKK, Tbl. 1.

[42] 42 U.S.C. § 7411(f)(2).

[43] *See* 42 U.S.C. § 7411(b)(1)(B).

[44] *See* Standards of Performance for Petroleum Refineries, 73 Fed. Reg. 35,838, 35,859 (June 24, 2008).

[45] For a more thorough discussion of EPA's legal responsibilities in this area, see Inimai Chettiar & Jason Schwartz, *The Road Ahead: EPA's Options and Obligations for Regulating Greenhouse Gases* 50-51 (Inst. for Policy Integrity Report No. 3, 2009) [hereinafter THE ROAD AHEAD].

III. EPA should include flexible compliance mechanisms in its final rule.

This section examines policy choices that would increase compliance flexibility and the efficiency of emissions reductions. After a short discussion of general policy and legal principles, different policy options are presented, beginning with those that offer the greatest flexibility and efficiency benefits for the least legal risk.[46] The policy options discussed below are:

1. EPA should define "air pollutants" as a mix of GHGs.
2. EPA should allow bubbling.
3. EPA should allow banking of emissions allowances.
4. EPA should allow all possible methods of emissions reductions to count towards compliance.
5. EPA should allow trading of emissions credits among sources.
6. EPA should allow borrowing against future emissions allowances.

General Policy Principles. EPA should develop an emissions reduction program that maximizes social welfare to the greatest extent possible given the limits of its legal authority under the Clean Air Act. In particular, EPA should use flexible, market-based mechanisms because they allow firms to identify and take advantage of low-cost emissions reduction opportunities.[47] EPA should strive to develop a market-based approach where the marginal cost of abating one additional unit of pollution is equalized among all sources, yielding cost-effective emissions reductions.[48]

Using flexible compliance mechanisms is particularly vital because EPA's NSPS regulation is an important early step in addressing climate change at the federal level. Applying a flexible approach will provide valuable learning experiences that can inform future regulatory and legislative efforts to develop more comprehensive climate solutions.[49]

General Legal Principles. The "standard of performance" required under §§ 111(b) and (d) is defined broadly, giving EPA authority to include flexibility mechanisms in its regulations for new sources and its guidelines for state regulation of existing sources. Section 111(a)(1) defines a "standard of performance" as reflecting "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 nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[50]

Nothing in the expansive definition of "standard of performance" precludes the use of flexible compliance mechanisms and no negative inference against authority to apply flexible mechanisms is warranted. In the current text, the standard is defined in terms of a "system," rather than a particular technology or design.[51] In 1990, Congress amended § 111 to remove the word "technology" from its definition of performance standards, demonstrating congressional intent to

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[46] Where the source or strength of legal authority is distinct under § 111(b) regulation of new sources versus under § 111(d) regulation of existing sources, these distinctions are discussed in each individual sub-recommendation included below.

[47] THE ROAD AHEAD, *supra* note 45, at 62–63; Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?*, 1997 U. CHI. LEGAL. F. 293, 297–98 [hereinafter Stavins, *Policy Instruments*].

[48] *See* Stavins, *Policy Instruments*, *supra* note 47, at 297–98; EPA, GUIDELINES FOR PREPARING ECONOMIC ANALYSES 4-2 (2010) ("A policy is cost-effective if it meets a given goal at least cost . . . . A policy is considered cost-effective when marginal abatement costs are equal across all polluters. In other words, for any level of total abatement, each polluter has the same cost for their last unit abated.").

[49] Jonas Monast et al., *Avoiding the Glorious Mess: A Sensible Approach to Climate Change and Clean Air Act* 8 (Nicholas Institute for Environmental Policy Solutions Working Paper, Duke University, 2010).

[50] 42 U.S.C. § 7411(a)(1).

[51] *Id.*

increase the flexibility of the "standard of performance" phrase and freeing § 111(a)(1) from any statutory requirement that the standards be technology-based.[52] Similarly, in the context of new and modified sources, § 111(b)(5) expressly states that, except as provided for in § 7411(h) (which addresses work practice and other alternative standards), "nothing in this section shall be construed to require . . . any new or modified source to install and operate any particular *technological system* of continuous emission reduction to comply with any new standard of performance."[53] Thus the statutory text and legislative history support EPA's authority to apply flexible compliance mechanisms.

Even under a conservative reading, the statute is ambiguous as to whether flexible compliance mechanisms are allowed. Under *Chevron*, statutory ambiguity gives an agency discretion to interpret the terms at issue.[54] Assuming a negative inference against flexibility from statutory ambiguity is not a proper reading of the text in this administrative law setting.[55] Courts should not assume a negative inference unless it is clear that Congress intended to preclude the option.[56] No clear signal exists here, and the statutory text and legislative history in fact point in the opposite interpretative direction.[57] Furthermore, a forthcoming article demonstrates how and why the complex economic considerations involved in many environmental rulemakings imply that courts should be particularly deferential to EPA's use of market-based mechanisms in its regulations.[58]

In addition, the presence of a general definition of "standard of performance" in § 302(l) of the Clean Air Act does not preclude use of flexible compliance mechanisms under § 111.[59] While the definitions in § 302 do apply to the Clean Air Act as a whole, "[s]pecific terms prevail over the general in the same or another statute which otherwise might be controlling."[60] The general provision contained in § 302(*l*) should not trump the definition of "standard of performance" contained in § 111(a)(1), which is specifically applicable to this rulemaking.

Even if EPA believes that the text of § 302(*l*) is relevant to interpretation of § 111(a)(1), use of flexible compliance mechanisms is not prohibited. While § 302(l) defines a "standard of performance" as requiring "continuous emission reduction,"[61] the absence of similar language in § 111 indicates that this requirement does not apply in the NSPS context.[62] If EPA still believes that the requirement is by inference applicable to § 111, the agency can incorporate strategies to ensure

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[52] See Monast et al., *supra* note 49 (citing EPA's reference to these amendments).

[53] 42 U.S.C. § 7411(b)(5) (emphasis added).

[54] *See* Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 843 (1984).

[55] *Cf.* Fin. Planning Assoc. v. SEC, 482 F.3d 481 (D.C. Cir. 2007) (noting "this court has repeatedly held that *expressio unius* is 'an especially feeble helper in an administrative setting, where Congress is presumed to have left to reasonable agency discretion questions that it has not directly resolved'"); Texas Rural Legal Aid Inc. v. Legal Serv. Corp., 940 F.2d 685, 694 (D.C. Cir. 1991) (explaining that the *expressio unius est exclusio alterius* canon "has little force in the administrative setting. Under *Chevron*, we normally withhold deference from an agency's interpretation of a statute only when Congress has 'directly spoken to the precise question at issue,' and the *expressio* canon is simply too thin a reed to support the conclusion that Congress has clearly resolved this issue").

[56] *Id.*

[57] *See supra* notes 51–52 and accompanying text.

[58] *See* Mark E. LeBel, *Lack of Judicial CAIR: Chevron Deference and Market-Based Environmental Regulations*, 20 N.Y.U. ENVTL. L.J. (forthcoming 2012).

[59] 42 U.S.C. § 7602(*l*).

[60] Fourco Glass Co. v. Transmirra Prods. Corp., 353 U.S. 222, 228–29 (1957) (citations and quotation marks omitted).

[61] 42 U.S.C. § 7602(*l*).

[62] As discussed above, § 111(b)(5) expressly states that, except as provided for in § 7411(h) (which addresses work practice and other alternative standards), "nothing in this section shall be construed to require . . . any new or modified source to install and operate any particular technological system of *continuous emission reduction* to comply with any new standard of performance." 42 U.S.C. § 7411(b)(5) (emphasis added).

"continuous emissions reduction" that are compatible with flexible compliance mechanisms. By setting the standard below current emissions levels and requiring uninterrupted compliance, EPA's regulation would achieve "continuous emission reduction." Further, EPA is required under § 111(b) to revise the standards "from time to time" and could provide for automatic future reductions in the rule (a meritorious approach in its own right, as described in Part VI of these comments).[63] EPA could also ensure "continuous emission reduction" by including projections of plants' remaining useful lives in any emissions budget allocation or by retiring the emissions allowances of retired plants.[64]

Thus, issuing a regulation that incorporates flexible compliance mechanisms is a reasonable exercise of EPA's discretion under § 111. Regulatory programs that incorporate flexible compliance mechanisms are the lowest cost and most efficient systems for reducing emissions and therefore can be the "best system of emissions reduction,"[65] taking costs "into account." As discussed for each policy option below, each available flexible mechanism has been applied before and is "adequately demonstrated."

1) EPA should define "air pollutants" as a mix of GHGs.

EPA should define "air pollutants" as the mix of GHGs emitted from power plants and set its emissions requirement in terms of CO_2 equivalents (CO_2e). This decision will yield substantial efficiency benefits. Setting the emissions requirement in terms of CO_2e, rather than individually regulating each pollutant, will allow firms to target emissions abatement efforts towards the GHG that has the lowest marginal abatement cost. This flexibility will ensure that the marginal cost of abatement is equal among all GHGs and lead to more cost-effective reduction of GHG emissions.

EPA has ample legal authority to apply this definition. In its endangerment finding for mobile source GHG emissions under § 202, EPA defined "air pollution" as the mix of six long-lived and directly emitted GHGs in light of their common properties and common effects on the atmosphere.[66] Applying the same definition here would be consistent with prior EPA practice and is equally appropriate under the text of § 111. The emissions requirement in § 111(a)(1) is defined as a "standard for emissions of *air pollutants*."[67] The use of the plural, "pollutants," in § 111 explicitly permits a standard that limits more than one type of emissions. Therefore, the agency has discretion to define "air pollutants" as a mix of GHGs.

2) EPA should allow compliance based on an averaged emissions rate, or "bubbling."

EPA should use its clear legal authority to apply bubbling and take advantage of this straightforward opportunity to increase the cost-effectiveness of emissions reductions.

Under a bubbling approach, an imaginary bubble is placed over an entire contiguous facility and the emissions rate is calculated by averaging the rate over the bubble. Compliance is determined by whether the entire facility meets the applicable emissions rate, rather than requiring each covered

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[63] 42 U.S.C. § 7411(b).

[64] Further discussion of the role of § 302(*l*) in interpretation of § 111(a)(1) is available in THE ROAD AHEAD, *supra* note 45, at 86–88.

[65] *See* Entergy Corp. v. Riverkeeper, Inc., 129 S.Ct. 1498, 1506 (2009) ("'[B]est technology' may [] describe the technology that most efficiently produces some good. In common parlance one could certainly use the phrase 'best technology' to refer to that which produces a good at the lowest per-unit cost.").

[66] The six GHGs are carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. *See* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496, 66,516 (Dec. 15, 2009). Similarly, EPA has in the past defined "air pollution" as "oxides of nitrogen," a class of several related but distinct compounds. *See id.* at 66,517.

[67] 42 U.S.C. § 7411(a)(1) (emphasis added).

stack to comply with the standard individually. Excess pollution at one stack is allowable as long as it is offset by lower emissions at another. Therefore, the covered facility can achieve the required emissions rate by instituting emissions reductions through the lowest-cost opportunities available within the bubble, increasing the overall efficiency of emissions reductions.

EPA has used a bubbling approach in numerous other regulations. For example, the substantive holding in the iconic administrative law decision *Chevron v. NRDC* affirmed EPA's application of bubbling in the context of New Source Review and EPA's nonattainment permit program.[68] In interpreting the definition of "stationary source" in § 111(a)(3) as "any building, structure, facility, or installation," the Supreme Court stated that "the language itself implies a 'bubble concept' of sorts"[69] and "the listing of overlapping, illustrative terms was intended to enlarge, rather than to confine, the scope of the agency's power to regulate particular sources in order to effectuate the policies of the Act."[70] This language, while dicta, directly validates EPA's authority to apply bubbling in its NSPS regulation of GHG emissions, just as the agency has used bubbling in other contexts. EPA should exercise this discretion and allow compliance based on an emissions rate averaged over all contiguous facilities.[71]

3) EPA should allow banking of emissions allowances.

"Banking" of allowances lets sources reduce emissions more quickly than required, save the unused emissions credits, and then use the saved allowances in the future. EPA should allow banking in its NSPS for new and existing sources, using the agency's clear legal authority to apply a demonstrated strategy to increase the cost-effectiveness of emissions reductions.

Banking gives regulated entities greater flexibility in timing emissions reduction investments, enabling sources to plan for and make investments at the lowest cost time period.[72] If banking is allowed, firms will be able to save costs by banking emissions credits when marginal abatement costs are likely to rise. Analyses of the SO_2 emissions market found that the banking provisions led to compliance savings of roughly 7%[73] and helped spur cost-effective emissions reduction investments.[74]

If the NSPS regulation includes a permit trading market, banking can alleviate the potential for price fluctuations by increasing the size and robustness of the market.[75] Banking allows firms with lower costs of abatement to save up extra allowances in early years and use them when prices rise, which

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[68] *See* 467 U.S. 837, 845 (1984).

[69] *Id.* at 861.

[70] *Id.* at 862.

[71] If EPA does not allow trading, the flexibility allowed by bubbling may give an advantage to existing facilities, which will have the ability to bubble new emitting sources with their existing sources. This added pool of emissions reduction opportunities may allow existing sources to reduce emissions and meet the NSPS standards for a lower cost versus new entrants. When determining how to whether to allow partial or temporary grandfathering, EPA should consider whether bubbling will create a barrier to entry for new sources and enhance the "old plant effect."

[72] *See* Harrison Fell et al., *Prices Versus Quantities Versus Bankable Quantities* 15 (Resources for the Future, Discussion Paper 08-32-REV, 2008), *available at* http://ssrn.com/abstract=1272661.

[73] A. DENNY ELLERMAN ET AL., MARKETS FOR CLEAN AIR: THE U.S. ACID RAIN PROGRAM (2000). *But see* Dallas Burtraw & Erin Mansur, *The Effects of Trading and Banking in the SO_2 Allowance Market* 19 (Resources for the Future, Discussion Paper 99-25, 1999) (finding that firms made large *ex ante* compliance investments that were not cost-justified *ex post*).

[74] *See* Dallas Burtraw, *Innovation Under the Tradable Sulfur Dioxide Emission Permits Program in the U.S. Electricity Sector* 9 (Resources for the Future, Discussion Paper 00-38, 2000) (finding that the banking provisions spurred significant investment in abatement technology).

[75] *See* Fell et al., *supra* note 72, at 15.

can mitigate price increases.[76] Furthermore, firms that have banked credits have an additional incentive to sustain the stability of the trading scheme in order to maintain the value of their investment.[77]

Banking makes particular sense in the context of GHGs. The long lifespan of GHGs in the atmosphere means that earlier reductions are beneficial for many years. As long-lived, global pollutants, GHGs do not have the potential to create hot spots, either spatially (in the case of a trading program where emissions become concentrated in one location) or temporally (in the case of a banking system where regulated entities disproportionately use emissions credits in one time period).

EPA has authority to authorize banking either for new sources under § 111(b) or for existing sources under § 111(d). Section 111(b) gives EPA discretion to determine the "best system of emission reduction," taking cost into account.[78] Banking provisions still assure that an individual regulated entity will achieve its required emissions reductions on-site. The additional compliance flexibility provided by emissions banking is a permissible exercise of the agency's discretion to determine what is the "best system" for reducing emissions, considering costs, since the overall standard will still be met, but in a more cost-effective, efficient manner. Given the breadth of the phrase "best system," as well as recent D.C. Circuit precedent explicitly holding that "best" regulation can be interpreted as most efficient,[79] EPA's decision to incorporate banking is within its authority under § 111(b).

Similarly, existing EPA regulations on § 111(d) guidelines explicitly affirm that the guidelines to states will provide "incremental periods of time normally expected to be necessary" for implementation of the standards. Compliance with those standards in a shorter time frame is presumably encouraged and certainly not precluded.[80]

Further, precedent for use of emissions reduction banking is widespread in both EPA and state programs. Banking of emission credits is already in use in several comparable Clean Air Act regulatory programs. Existing federal pollution control schemes that allow some form of banking include the NO_x Budget Trading Program, the Sulfur Dioxide Emissions Allowance Program, the Regional Clean Air Incentives Market, and, in the past, the Lead Phase-out Program.[81] The three regional programs for carbon emissions trading all allow banking as well.[82]

4) EPA should allow all possible methods of emissions reductions to count towards compliance.

All possible methods of emissions reductions should count towards compliance with the NSPS, as long as the reduction strategies can be reliably measured and monitored. Environmental statutes and regulations have historically preferred performance standards over design standards because they increase efficiency by spurring regulated entities to design and apply the lowest-cost

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[76] *See* Dallas Burtraw & Sarah Jo Szambelan, *U.S. Emissions Trading Markets for SO_2 and NO_x*, *in* PERMIT TRADING IN DIFFERENT APPLICATIONS 29 (Bernd Hansjürgens ed., 2010).

[77] *Id.*

[78] 42 U.S.C. § 7441(b).

[79] Entergy Corp. v. Riverkeeper, Inc., 129 S.Ct. 1498, 1506 (2009).

[80] Publication of Guidance Documents, Emission Guidelines, and Final Compliance Times, 40 C.F.R. § 60.22(b)(4) (2010).

[81] *See* THOMAS H. TIETENBERG, EMISSIONS TRADING 124 (2006).

[82] Franz T. Litz et al., *What's Ahead for Power Plants and Industry?* 18 (World Resources Institute & Columbia Law School Center for Climate Change Law, Working Paper, 2011).

emissions reduction strategy.[83] EPA should adopt a similar philosophy here and enable individual sources to choose among a variety of emissions reduction options when designing their NSPS compliance strategy.

Major potential emissions reduction sources include on-site plant efficiency improvements, fuel switching, end-use (off-site) usage reductions, and carbon capture and sequestration. On-site improvements are the most conventional form of NSPS compliance, and EPA itself estimates that these investments could produce emissions reductions of up to 10% from 2005 levels in the next decade.[84] Incorporating fuel switching, from coal-fired plants to either natural gas or biomass, could reduce heat rates by an additional 2-5% across the utility sector.[85]

End-use Energy Efficiency. Demand-side energy efficiency has regularly been recognized as the lowest-cost source of GHG emissions reductions.[86] A variety of studies suggest that a flexible emissions control program that incentivizes end-use efficiency initiatives could achieve GHG emissions reductions at lowest cost and potentially even at negative cost.[87]

EPA should enable any regulated entity that spearheads targeted and supervised end-use efficiency initiatives to take credit for emissions reductions spurred by the program's success. Off-site efficiency programs decrease plant utilization rates, creating a direct link between efficiency investments and emissions reductions at regulated facilities. Section 111 does not require that emissions reductions occur at the regulated entity;[88] however, the close link between a regulated entity's end-use efficiency programs and on-site decreased plant utilization and emissions strengthens the legal basis for including such forms of compliance within a § 111 standard.

While EPA has disavowed consideration of emissions reductions from off-site efficiency programs in its guidance on Best Available Control Technology ("BACT") determinations for Prevention of Significant Deterioration permitting, there are clear distinctions between the text of § 169 and

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[83] *See, e.g.*, 42 U.S.C. § 7411(a)(1); 42 U.S.C. § 7478(3); 42 U.S.C. § 7501(3). *See also* EPA, GUIDELINES FOR ECONOMIC ANALYSES 4-5 (2010) ("The flexibility of performance-based standards encourages firms to innovate to the extent that they allow firms to explore cheaper ways to meet the standard.").

[84] *See* Dallas Burtraw et al., *Greenhouse Gas Regulation Under the Clean Air Act: A Guide for Economists* 7-8 (Resources for the Future, Discussion Paper 11-08, 2011) (summarizing EPA cost-effectiveness analyses for several sectors).

[85] *See* Litz et al., *supra* note 82, at 10–12.

[86] *See, e.g.*, MCKINSEY & CO., IMPACT OF THE FINANCIAL CRISIS ON CARBON ECONOMICS: VERSION 2.1 OF THE GLOBAL GREENHOUSE GAS ABATEMENT COST CURVE 8 (2010), *available at* http://www.mckinsey.com/en/Client_Service/Sustainability/Latest_thinking/~/media/McKinsey/dotcom/client_service/Sustainability/cost%20curve%20PDFs/ImpactFinancialCrisisCarbonEconomicsGHGcostcurveV21.ashx.

[87] *See* ENERGY CENTER OF WISCONSIN, A REVIEW AND ANALYSIS OF EXISTING STUDIES OF THE ENERGY EFFICIENCY RESOURCE POTENTIAL IN THE MIDWEST (2009), http://www.midwesterngovernors.org/Energy/EEResourcePotential.pdf (efficiency investments would reduce energy demand by 0.5-1.6% per year in Midwest); GEORGIA INSTITUTE OF TECHNOLOGY, META-REVIEW OF EFFICIENCY POTENTIAL STUDIES AND THEIR IMPLICATIONS FOR THE SOUTH (2009), http://www.spp.gatech.edu/faculty/workingpapers/wp51.pdf (efficiency investments could produce up to 9% reduction from projected 2020 energy use levels across the South); FEDERAL ENERGY REGULATORY COMMISSION, A NATIONAL ASSESSMENT OF DEMAND RESPONSE POTENTIAL (2009), http://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf; MCKINSEY & COMPANY, UNLOCKING ENERGY EFFICIENCY IN THE U.S. ECONOMY (2009) (a "holistic approach" would reduce roughly 23% of projected energy demand in 2020, and 40% of abatement could be achieved at negative marginal costs).

[88] § 111(b) specifies that EPA "shall publish proposed regulations, establishing Federal standards of performance *for new sources*"; similarly, § 111(d) states that EPA "shall prescribe regulations . . . under which each State shall submit to the Administrator a plan which [] establishes standards of performance *for any existing source*." 42 U.S.C. §§ 7411(b)(1)(B), (d)(1). This language does not include any requirement that emissions reductions occur at the source. Instead, it requires EPA set standards for each source. As long as EPA applies its "standard of performance" to any new and (through state plans) existing sources, its standard fulfills the requirements of § 111, regardless of whether sources comply by implementing their own emissions abatement measures or by purchasing credits or allowances from qualified sources.

§ 111.[89] The statutory text defining BACT directly links the limitation to a particular, individual source, stating that BACT "means an emission limitation based on the maximum degree of reduction of each pollutant . . . which the permitting authority, on *a case-by-case basis* . . . determines is achievable *for such facility*."[90] In contrast, the § 111 text that defines the applicable "standard" omits any linkage of emissions reductions to individual regulated entities.[91] EPA's discretion to allow flexible compliance mechanisms under § 111 is not bound by guidance issued under the distinct text and mandate of § 169.

In particular, EPA's authority to include end-use efficiency approaches under § 111(d) builds on precedent under § 110. EPA has for many years allowed states to incorporate end-use efficiency into their SIP compliance.[92] Because the text of § 111(d) makes establishment of guidelines for state regulation of existing sources explicitly analogous to the SIP process found in § 110,[93] the long-standing SIP guidance document on energy efficiency provides precedent for using such an approach under § 111(d).[94]

While off-site improvements raise concerns related to measurement, attribution, and incentive effects, EPA has largely addressed these issues elsewhere. EPA will have to clarify: (1) how to measure and monitor the emissions reductions, (2) how to attribute the reductions, and (3) what effect the improvements will have on future emissions reduction incentives. EPA has already addressed the first two concerns in its SIP guidance on energy efficiency, which provides an accountable, verifiable framework for quantifying emissions reductions from off-site efficiency initiatives.[95] EPA should assess and evaluate the validity of the third concern. If plants invest in demand-side improvements that lower plant utilization, then this could diminish the emissions reductions that will be achieved with future on-site improvements for a facility because the plant will be operating at a lower capacity. EPA should take into account this ancillary effect of off-site emissions reductions in evaluating the benefits of on-site projects as well as the incentive for facilities to improve on-site abatement technology.

Carbon Capture and Sequestration ("CCS"). CCS technology is not cost-benefit justified at present, but it may become economically efficient in the future. Utilities may need to make equipment decisions now that will determine whether a plant is capable of incorporating CCS later. In these scenarios, incentivizing or requiring CCS-compatible technology now may be necessary to enable lowest-cost emissions reductions in the future.

EPA should consider whether to incorporate CCS into § 111 standards for new and existing sources based on the agency's reasoned evaluation of when the technology will be "adequately

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[89] EPA, *PSD and Title V Permitting Guidance for Greenhouse Gases* (2011), http://www.epa.gov/nsr/ghgdocs/ghgpermittingguidance.pdf.

[90] 42 U.S.C. § 7479(3) (emphasis added).

[91] 42 U.S.C. § 7411(a)(1).

[92] EPA, Office of Air and Radiation, Guidance on State Implementation Plan (SIP) Credits for Emission Reductions from Electric-Sector Energy Efficiency and Renewable Energy Measures (August 2004).

[93] "The Administrator shall prescribe regulations which shall establish a procedure similar to that provided by section 110 [42 U.S.C. § 7410] under which each State shall submit to the Administrator a plan which establishes standards of performance for any existing source for any air pollutant." 42 U.S.C. § 7411(d)(1). Section 110 explicitly supports the use of economic incentive methods to achieve compliance. 42 U.S.C. § 7410 ("Each such plan shall 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 may be necessary or appropriate to meet the applicable requirements of this Act." (emphasis added)).

[94] *See supra* note 92.

[95] *Id.*

demonstrated."[96] EPA has discretion to include CCS under a § 111(b) new source standard by interpreting "best system of emission reduction . . . adequately demonstrated" as incorporating future use of CCS on a timeline the agency decides is feasible based on expected rates of technology development. Similarly, in the agency's guidelines for state regulation of existing sources, EPA should allow states to incorporate CCS into their state plans. One state has already made CCS compatibility part of its lease approval process, highlighting the need to support and recognize these types of forward-thinking state initiatives.[97]

5) EPA should allow trading of emissions credits among sources.

As defined in § 111(a)(1), a standard of performance is based on "the degree of emission limitation achievable through the application of the *best system* of emission reduction . . . taking into account the cost."[98] The broad terms of this provision, as well as a recent Supreme Court decision holding "most efficient" as one reasonable interpretation of the "best" regulatory approach, [99] give EPA ample authority to incorporate trading provisions in its NSPS regulations. EPA should exercise its discretion and define trading as a vital part of the most efficient and best system for reducing GHG emissions under § 111.

Emissions trading is permissible under § 111 because the provision includes no requirement that the emissions reductions attributed to a facility be made at the facility itself. In particular, the definition of "standard of performance" in § 111(a)(1) includes no requirement that emissions reductions be linked to individual regulated entities.[100] Similarly, §§ 111(b) and (d) compel EPA to set standards for sources, but do not include any requirement that emissions reductions occur at the source.[101] As long as EPA applies its "standard of performance" to any new and (through state plans) existing sources, its standard fulfills the requirements of § 111, regardless of whether sources comply by implementing their own emissions abatement measures or by purchasing credits or allowances from qualified sources. The absence of a specific command gives EPA discretion to interpret the statute within reasonable bounds.[102]

It is plainly reasonable for EPA to conclude that market-based regulatory schemes that incorporate emissions trading are part of the "best" strategy to reduce GHG emissions under § 111. Trading mechanisms allow firms to seek out and take advantage of the cheapest pollution reductions options available within the entire universe of the trading market, substantially reducing the cost of emissions control.[103] EPA has long recognized the efficiency benefits of using market mechanisms

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[96] *See* Part VI, *infra*, discussing how EPA can and should automatically phase-in stronger NSPS standards in the future to reflect the development of additional "adequately demonstrated" technologies, including CCS.

[97] MONT. CODE ANN. § 69-8-421(8) (2011).

[98] 42 U.S.C. § 7411(a)(1).

[99] *See* Entergy Corp. v. Riverkeeper, Inc., 129 S.Ct. 1498, 1506 (2009) ("'[B]est technology' may [] describe the technology that most efficiently produces some good. In common parlance one could certainly use the phrase 'best technology' to refer to that which produces a good at the lowest per-unit cost.").

[100] 42 U.S.C. § 7411(a)(1) ("The term 'standard of performance' means a standard for emissions of air pollutants which 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 nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated.").

[101] Section 111(b) specifies only that EPA shall establish "standards of performance *for new sources*." 42 U.S.C. § 7411(b) (emphasis added). Similarly, § 111(d) requires that EPA issue guidelines under which states will establish "standards of performance *for any existing source*." 42 U.S.C. § 7411(d) (emphasis added).

[102] *See* Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 843 (1984).

[103] *See* THE ROAD AHEAD, *supra* note 45, at 62–63; Stavins, *Policy Instruments*, *supra* note 47, at 297–98.

in GHG regulations, stating in its Advanced Notice of Proposed Rulemaking on regulation of GHGs that:

> Market-oriented approaches are relatively well-suited to controlling GHG emissions. Since emissions of the major GHGs are globally well-mixed, a unit of GHG emissions generally has the same effect on global climate regardless of where it occurs . . . . Providing flexibility on the method, locations, and precise timing of GHG reduction would not significantly affect the global climate protection benefits of a GHG control program (assuming effective enforcement mechanisms), but could substantially reduce the cost and encourage technology innovation.[104]

Similarly, EPA's 2010 *Guidelines for Economic Analyses* highlighted the benefits of market-based approaches that allow emissions trading, concluding that:

> [Market-based approaches] typically allow firms more flexibility than more traditional regulations and capitalize on the heterogeneity of abatement costs across polluters to reduce aggregate pollution efficiently. Environmental economists generally favor market-based policies because they tend to be least costly, they place lower information burden on the regulator, and they provide incentives for technological advances.[105]

EPA itself has interpreted the phrase "standard of performance" to allow trading in two recent § 111 rulemakings. In its Clean Air Mercury Rule ("CAMR"), EPA enacted a cap-and-trade system for existing sources under § 111.[106] In the CAMR rulemaking, EPA declared that a tradable permit program fit within "a careful reading of the section 111(a) definition [of] standard of performance," finding support in both the statutory text and the legislative history of the 1977 Clean Air Act Amendments.[107] Prior to CAMR, EPA authorized a trading scheme under § 111(d) for emissions of nitrogen oxides.[108]

Recent court decisions on earlier EPA cap-and-trade programs have left intact EPA's authority to include trading mechanisms within § 111 regulations. The D.C. Circuit's decision in *New Jersey v. EPA* did strike down the § 111 CAMR tradable permit program, but the court's vacatur was spurred by EPA's failure to follow procedures specific to § 112.[109] Prior to issuing CAMR, EPA had removed electricity generating units ("EGUs") from the list of sources of mercury regulated under § 112 without following the specific delisting procedures enumerated in § 112(c)(9). The court concluded that EGUs were therefore still listed as sources of mercury under § 112 and thus regulation of their mercury emissions under § 111 was unlawful. The court never reached the entirely unrelated issue of EPA's authority to establish CAMR's tradable permit program under § 111.[110]

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[104] Regulating Greenhouse Gas Emissions Under the Clean Air Act; Advanced Notice of Proposed Rulemaking, 73 Fed. Reg. 44,354, 44,410 (July 30, 2008).

[105] EPA, GUIDELINES FOR ECONOMIC ANALYSES 4-5 (2010).

[106] Standards of Performance for New and Existing Stationary Sources: Electric Utility Steam Generating Units, 70 Fed. Reg. 28,606, 28,616–17 (May 18, 2005) [hereinafter CAMR].

[107] *See id.*

[108] 40 C.F.R. 60.33b.

[109] 517 F.3d 574, 578 (D.C. Cir. 2008) ("EPA's removal of these EGUs from the section 112 list violates the CAA because section 112(c)(9) requires EPA to make specific findings before removing a source listed under section 112; EPA concedes it never made such findings. Because coal-fired EGUs are listed sources under section 112, regulation of existing coal-fired EGUs' mercury emissions under section 111 is prohibited, effectively invalidating CAMR's regulatory approach. Accordingly, the court grants the petitions and vacates both rules.").

[110] *Id.* at 584 ("In view of our disposition, the court does not reach other contentions of petitioners or intervenors.").

Similarly, the decision in *North Carolina v. EPA* involved EPA's Clean Air Interstate Rule ("CAIR") trading program, but the D.C. Circuit's decision to vacate the rule was spurred by language in § 110 unrelated to the § 111 provisions that govern this rulemaking.[111] In *North Carolina*, the court found that EPA had failed to ensure that its interstate trading program would meet the requirements of § 110(a)(2)(D)(i)(1), which stipulates that each state implementation plan "contain adequate provisions prohibiting . . . any source . . . within the State from emitting any air pollutant in amounts which will [] contribute significantly to nonattainment in . . . any other State with respect to any such national primary or secondary ambient air quality standard."[112] The court concluded that EPA had had a duty to ensure that its rule achieved "something measurable toward the goal of prohibiting sources 'within the State' from contributing to nonattainment or interfering with maintenance 'in any other State.'"[113] Because CAIR did not measure each covered state's "significant contribution" to downwind nonattainment and demonstrate that CAIR would eliminate each "significant contribution," the court vacated the rule.[114] The requirements of § 110(a)(2)(D)(i)(1) are not contained or reflected in the capacious language of § 111; therefore, the *North Carolina* holding is inapposite to this rulemaking.

Both the *New Jersey* and *North Carolina* decisions halted the implementation of an EPA tradable permit program. However, each decision turned on interpretation of statutory provisions (§ 112(c)(9) and § 110(a)(2)(D)(i)(1), respectively) unrelated to this § 111 rulemaking. These two decisions do not undermine EPA's authority to include trading provisions in this rule.

Furthermore, flexible compliance mechanisms have been "adequately demonstrated" as required in § 111(a). Multiple EPA regulations have successfully incorporated emissions trading. The Acid Rain tradable permit program enacted under the 1990 Clean Air Act Amendments reduced sulfur dioxide emissions dramatically in its first 12 years, even as electricity generation increased during the same period.[115] The nitrogen oxides SIP Call also used a tradable permit scheme to reduce emissions within the covered 21 states and the District of Columbia.[116]

The argument for trading applies to both §§ 111(b) and (d) in almost identical form. Both sections use the term "standard of performance," defined in § 111(a), which can include trading mechanisms within its scope as described above. Nevertheless, some commentators have argued that legal authority for trading may be more secure under § 111(d).[117] This claim is based on a structural inference: since § 111(b) regulates individual sources and contains no reference to SIP-like provisions as in § 111(d), this could suggest that Congress did not intend to allow new sources as much flexibility in complying with § 111(b). However, this is a fairly weak inference, and the

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[111] 531 F.3d 896, 907 (D.C. Cir. 2008) ("Because CAIR is designed as a complete remedy to section 110(a)(2)(D)(i)(I) problems, as EPA claims, CAIR must do more than achieve something measurable; it must actually require elimination of emissions from sources that contribute significantly and interfere with maintenance in downwind nonattainment areas. To do so, it must measure each state's 'significant contribution' to downwind nonattainment even if that measurement does not directly correlate with each state's individualized air quality impact on downwind nonattainment relative to other upwind states." (citations omitted)). The D.C. Circuit subsequently granted EPA's petition for a remand without vacatur. North Carolina v. EPA, 550 F.3d 1176, 1178 (D.C. Cir. 2008).

[112] 42 U.S.C. § 7410(a)(2)(D)(i)(1).

[113] 531 F.3d at 907.

[114] *Id.* at 908.

[115] *See* CAMR, 70 Fed. Reg. 28,606, 28,617 (describing the Acid Rain program).

[116] *Id.* (describing the NO_x SIP Call).

[117] *See, e.g.*, Kyle Danish, Tomas Carbonell & Kevin Gallagher, *The Clean Air Act and Global Climate Change* 539, *in* THE CLEAN AIR ACT HANDBOOK (Julie R. Domike & Alec C. Zacaroli eds., 3rd ed., 2011); Resources for the Future, Ctr. for Climate Change Law & Inst. For Policy Integrity, *Prevailing Academic View on Compliance Flexibility under § 111 of the CAA* 4-6 (2011) [hereinafter *Prevailing Academic View*]; Litz et al., *supra* note 82, at 6-7.

statutory silence of § 111(b) gives EPA discretion to interpret the text within reasonable bounds.[118] SIPs are not the only reasonable way to introduce trading mechanisms, as EPA can enact the trading scheme directly rather than delegating responsibility to the states.

EPA should allow trading among and within source categories, and should define source categories broadly to facilitate intra-category trading.

EPA should exercise its discretion to allow trading among and within source categories. However, because trading within a single category is less legally and logistically fraught, EPA should define source categories broadly to facilitate intra-category trading.

As discussed above, the text of §§ 111(b) and (d) does not preclude trading and does not demand that emissions reductions attributed to a facility be made at the facility itself. The statutory silence should be interpreted to provide EPA with discretion to allow trading within and among source categories. Given the efficiency gains associated with trading, it is reasonable for EPA to conclude that trading is a key part of the "best" system of emissions reduction.

Section 111 requires EPA to identify stationary sources of pollutants and then to establish a "standard of performance" on a category-by-category basis. If EPA finds that trading qualifies as the "best system" under § 111, then the agency should have authority to define trading among sources within a category as the best system for that category.

However, defining § 111 to allow trading across categories may raise additional legal issues.[119] In particular, § 111(b) states that, for each category of sources listed under § 111(b)(1)(A), EPA shall establish a "standard of performance" for "new sources within such category," linking each standard to a particular category.[120] While § 111(d) does not contain similar language, it does refer back to regulation of new sources, potentially importing the link to categories.[121] Arguably, this link between categories and standards of performance could complicate the inclusion of inter-category trading. Even under this conservative interpretation, however, EPA could still allow inter-category trades to count towards compliance if the agency defines which other source categories are included within a "standard of performance" trading scheme as EPA regulates each source category. By explicitly defining each standard of performance as including other categories within its trading program, EPA would still ensure that the standard of performance continuously applies to "new sources"[122] and "any existing source,"[123] regardless of the source of any emissions credits.

Inter-category trading would also create the added logistical challenge of requiring equivalency metrics in order to ensure that a trade between sources in different categories would achieve equivalent emissions reductions. While these legal and policy difficulties are far from

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[118] *See* Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 843 (1984).

[119] Several academic analyses support this conclusion. *See, e.g.*, Nathan Richardson, Dallas Burtraw, and Art Fraas, Resources for the Future, *Greenhouse Gas Regulation Under the Clean Air Act: Structure, Effects, and Implications of a Knowable Pathway*, 41 ENV. L. NEWS & ANALYSIS 10,098 (2011); PEW CTR. ON GLOBAL CLIMATE CHANGE, GHG NEW SOURCE PERFORMANCE STANDARDS FOR THE POWER SECTOR: OPTIONS FOR EPA AND THE STATES 10 (2011) [hereinafter PEW CTR.]; Litz et al., *supra* note 82.

[120] 42 U.S.C. § 7411(b)(1)(B) ("Within one year after the inclusion of a category of stationary sources in a list under subparagraph (A), the Administrator shall publish proposed regulations, establishing Federal standards of performance *for new sources within such category*.") (emphasis added).

[121] 42 U.S.C. § 7411(d)(1) (EPA "shall prescribe regulations which shall establish a procedure . . . under which each State shall submit to the Administrator a plan which [] establishes standards of performance for any existing source . . . *to which a standard of performance under this section would apply if such existing source were a new source*." (emphasis added)).

[122] 42 U.S.C. § 7411(b)(1)(B).

[123] 42 U.S.C. § 7411(d)(1).

insurmountable, EPA would avoid both logistical and legal hurdles by restricting trading to within defined categories.

To avoid these obstacles, EPA should exercise its authority to define categories broadly. Section 111 mandates that EPA "publish . . . a list of categories of stationary sources."[124] The statute nowhere defines "category"; EPA thus has discretion to interpret "category" so long as the agency's final decision is reasonable.[125] The statute elsewhere grants EPA authority to "distinguish among classes, types, and sizes within categories of new sources,"[126] validating that a "category" of sources can encompass different types of sources. In *Lignite Energy Council v. EPA,* the D.C. Circuit affirmed EPA's discretion to determine the scope of standards and categories. The court's opinion upheld EPA's decision to issue uniform, category-wide NSPS for sources that had previously been treated as separate subcategories, highlighting that the court was "[m]indful of the high degree of deference [it] must show to EPA's scientific judgment."[127]

EPA should exercise this discretion and define source categories broadly, as this approach will buttress the agency's ability to allow emissions trading among a diverse variety of sources. Although EPA is only contemplating GHG performance standards for two types of sources at this time, it could be more complicated legally or practically for EPA to expand categories in the future after performance standards already exist.[128] Thus, the agency should start soliciting comments now on broadly defining source categories so that EPA will be able to pursue the option in the future.

In addition, defining categories broadly could ease the ability of state trading programs to qualify as "equivalent" under § 111(d).[129] The categories defined in § 111(b) regulations are likely to inform any categorization used for § 111(d) purposes[130] and the scope of state flexibility for trading among existing sources. If EPA's categories are narrower than the sectors covered in state schemes, existing state trading programs may face additional hurdles in qualifying as "equivalent."[131] EPA should create categories at least as broad as existing regional trading schemes so that state programs may easily qualify for equivalency under § 111(d).

<u>EPA should interpret § 111 to allow intrastate and interstate trading programs.</u>

EPA should explicitly interpret § 111 to allow trading both within and among states. Allowing large geographic areas to participate in trading will yield significant efficiency gains by expanding the size and diversity of the trading pool. The greater the difference in marginal costs of abatement among sources, the greater the efficiency gains available from trading. In addition, allowing interstate trading will ease the incorporation of existing interstate GHG programs into EPA's NSPS regulation.

As discussed above, the text of §§ 111(b) and (d) does not preclude trading and does not demand that emissions reductions attributed to a facility be made at the facility itself. The statutory silence should be interpreted to provide EPA with discretion to allow intrastate and interstate trading.

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[124] 42 U.S.C. § 7411(b)(1)(A).

[125] *See* Chevron U.S.A., Inc. v. NRDC, 467 U.S. 837, 843 (1984).

[126] 42 U.S.C. § 7411(b)(2).

[127] 198 F.3d 930, 933 (D.C. Cir. 1999).

[128] *See Prevailing Academic View*, *supra* note 117, at 6–7.

[129] See *infra* Part V for further discussion of issues related to state regulation under § 111(d) and equivalency.

[130] The statute does not require the categories in § 111(b) to be used for § 111(d). However, § 111(d) applies to any existing source that would be covered by § 111(b) if it were a new source, and thus the scope of § 111(b) is relevant. Having common sets of categories will make the determination of standards of performance easier under § 111(d).

[131] *See* Litz et al., *supra* note 82, at 19.

Given the efficiency gains associated with trading, it is reasonable for EPA to conclude that intrastate and interstate trading are a key part of the "best" system of emissions reduction.

In particular, EPA should have flexibility to allow or even require intrastate and interstate trading in guidelines to states under § 111(d). Section 111(d) includes a specific reference to § 110 State Implementation Plans,[132] which can include "economic incentives such as fees, marketable permits, and auctions of emissions rights."[133] Though § 111(d) refers to the "procedure," rather than the substance of § 110, the reference to the § 110 approach in § 111(d) allows EPA to grant states similarly broad discretion to experiment and innovate in their NSPS state plan submissions. In addition, § 111(d) directs EPA to permit states to consider "other factors" when developing their regulatory programs, giving states license to consider efficiency, flexibility, and other relevant concerns.[134]

Under § 110, states have substantial flexibility in designing their SIPs and should have at least as much flexibility under § 111(d).[135] In its 2005 CAMR Rule, EPA itself noted that the emissions guidelines approach under § 111(d) should emulate the SIP process.[136]

An explicit interpretation authorizing interstate trading would facilitate the certification of existing state trading programs as "equivalent" to the program included in EPA's § 111(d) emissions guidelines for states, rather than upending states' ongoing efforts to control GHG emissions.[137] Several existing state programs have or are in the process of implementing tradable permit programs to reduce GHG emissions from sources including fossil fuel-fired power plants. For example, the RGGI was launched in 2009 in the Northeast with the goal of stabilizing GHG emissions by 2014 and then reducing them by 2.5% each year through 2018.[138] RGGI covers only the power sector. WCI is scheduled for launch in 2012, with the goal of reducing GHG emissions by 15% below 2005 levels by 2020.[139] By allowing states to engage in these and similar regional approaches, EPA will respect states' preferences for compliance while encouraging efficiency gains through trading.

<u>EPA could achieve the most efficient emissions reductions by creating a cap-and-trade program, and it has the authority to do so.</u>

EPA should consider applying a cap-and-trade program under § 111. The significant efficiency advantages of a cap-and-trade scheme outweigh the legal risks associated with this approach.

A nationwide cap-and-trade program would give sources the greatest compliance flexibility and would lead to the optimal level of emissions across the regulated community.[140] Such an approach

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[132] 42 U.S.C. § 7411(d)(1).

[133] 42 U.S.C. § 7410(a)(2)(A).

[134] 42 U.S.C. § 7411(d)(1).

[135] *See* Train v. NRDC, 421 U.S. 60, 79 (1975); Virginia v. EPA, 108 F.3d 1397, 1410 (D.C. Cir. 1997); Florida Power & Light Co. v. Costle, 650 F.2d 579, 581 (5th Cir. 1981).

[136] *See* CAMR, 70 Fed. Reg. 28,606, 28,616 ("Taken together, these provisions authorize EPA to promulgate a 'standard of performance' that States must, through a SIP-like system, apply to existing sources."). CAMR was vacated by the D.C. Circuit for defects in the delisting of mercury emissions under § 112. *See New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008). The court did not reach the question of whether trading under § 111(d) is permissible. *Id*. at 584.

[137] See *infra* Part V for further discussion of issues related to state regulation under § 111(d) and equivalency.

[138] *See* Reg'l Greenhouse Gas Initiative, http://www.rggi.org.

[139] *See* W. Climate Initiative, http://www.westernclimateinitiative.org.

[140] *See* Jan-Tjeerd Boom & Bouwe R. Dijkstra, *Permit Trading and Credit Trading: A Comparison of Cap-Based and Rate-Based Emissions Trading Under Perfect and Imperfect Competition*, 44 ENVTL. RES. ECON. 107, 131 (2009).

is particularly sensible given that GHG emissions are global pollutants and do not raise hot spot concerns.[141]

In particular, a cap-and-trade approach has several efficiency advantages as compared to an emissions rate-based approach. While a rate regulation that allows for trading in emissions rate credits shares many elements with a cap-and-trade program, the two approaches are not identical. With rate-based credit trading, each source must meet a specified rate of emissions, either by reducing its own emissions or by purchasing credits from sources that have reduced emissions below the rate. This allows a socially optimal outcome in terms of the costs to the sources (assuming the rate is set at an optimal level): sources that can reduce emissions more cheaply will do so and sell the credits to sources that cannot reduce emissions as cheaply, until the cost for a single unit of reduction is equal among all sources.[142]

However, a rate-based scheme will deviate from the socially optimal level of overall emissions because a rate-based scheme subsidizes output by allowing additional emissions (at the standard rate or below) without requiring sources to pay for them via extra abatement or purchasing permits.[143] As elucidated by Boom & Dijkstra:

> [U]nder perfect competition, credit trading always leads to higher abatement costs than permit trading. This is the consequence of the higher level of output with credit trading. Since marginal abatement costs are higher with credit trading, the price of credits is higher than the price of permits. The implicit subsidization of output in the credit scheme has consequences for welfare. Since firms receive extra credits for free when increasing output, total output in the credit sector is too high. At the margin of production, marginal benefits to the consumer are lower than the actual marginal cost. This implies that the marginal abatement costs are not included fully in the market price of output. The combination of too high output and too high marginal abatement costs makes credit trading an inferior instrument compared with permit trading.[144]

To achieve a socially optimal level of emissions, a credit trading scheme will therefore require additional modeling and a stricter emissions rate than would be necessary to produce the same emissions outcome under a cap-and-trade system.

EPA has several arguments that it has legal authority to apply a cap-and-trade program under § 111. The broad definition of "standard of performance" in § 111(a)(1) requires EPA to determine the "best system of emission reduction"; the statute makes no explicit requirement that such a "system" be a plant-based emissions control rather than a trading scheme. As discussed above, the statute makes no requirement that the emissions reductions attributed to a facility be made at the facility itself.

Section 111(d) explicitly refers to the procedures of § 110, which allow state plans to include "economic incentives such as fees, marketable permits, and auctions of emission rights." Similarly, EPA regulations under § 111(d) authorize states to adopt an "allowance system" in their plans, which leaves room for a cap-and-trade approach. EPA exercised this authority when it applied a

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[141] Many GHG abatement measures have co-benefits in that they lead to reductions in criteria and hazardous air pollutants. As a result, trading programs may lead to hot spots if the distribution of criteria and hazardous air pollution co-benefits is not spatially uniform. However, these important concerns should not negate the efficiency benefits of a cap-and-trade approach to GHGs because EPA's existing criteria and hazardous air pollution programs are best designed to address these ancillary air pollution problems.

[142] *See* Boom & Dijkstra, *supra* note 140, at 131.

[143] *Id.*; Carolyn Fischer, *Combining Rate-Based and Cap and Trade Emissions Policies* 8 (Resources for the Future, Discussion Paper 03–32, 2003).

[144] *See* Boom & Dijkstra, *supra* note 140, at 131.

cap-and-trade approach in its CAMR.[145] This program's legality was never resolved in court, as the CAMR was vacated on other grounds.[146]

<u>EPA should allow offsets as an emissions reduction option.</u>

An offset is a project-based reduction that takes place at an otherwise unregulated source.[147] Offsets significantly expand the scope of potential sources of GHG reductions, thereby providing substantial efficiency benefits.[148]

Offsets are a way to bring sectors into the carbon market voluntarily, providing new sources of inexpensive emissions reductions.[149] In a recent legislative cap-and-trade analysis, EPA found that "offsets have a strong impact on cost containment," as allowing international offsets would lead to an 89% reduction in emissions allowance costs.[150] In a similar analysis, EPA found that barring international offsets would lead to cost increases ranging from 34-107%.[151]

Offsets present significant verification and monitoring challenges, but existing efforts to use offsets in trading programs are helping to develop solutions to these implementation challenges. All three existing regional GHG emissions reduction schemes include offset provisions. EPA should follow suit and allow offsets, including international projects, in order to dramatically lower compliance costs.

Offsets should be real, additional, verifiable, enforceable, and permanent.[152] All of these criteria ensure that any increase in GHG emissions by a regulated entity is fully compensated by a reduction in GHG emissions elsewhere. For an offset project to be "real," it must be subject to accurate quantification measures to confirm that it will achieve the emissions reductions promised.[153] To demonstrate additionality, the responsible party must show that the offset would not have happened absent the investment by the regulated entity.[154] Verifiability refers to both the initial validation of the project and the ability to periodically monitor the project.[155] Permanence may seem straightforward, but in fact it requires that EPA determine the amount of time that qualifies

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[145] *See* CAMR, 70 Fed. Reg. 28,606, 28,616 ("In the final rule, EPA interprets the term 'standard of performance,' as applied to existing sources, to include a cap-and-trade program. This interpretation is supported by a careful reading of the section 111(a) definition of the term, quoted above: A requirement for a cap-and-trade program (i) constitutes a 'standard for emissions of air pollutants' (i.e., a rule for air emissions), (ii) 'which reflects the degree of emission limitation achievable' (i.e., which requires an amount of emissions reductions that can be achieved), (iii) 'through application of (a) . . . system of emission reduction' (i.e., in this case, a cap-and-trade program that caps allowances at a level lower than current emissions).").

[146] *See* North Carolina v. EPA, 531 F.3d 896, 907 (D.C. Cir. 2008).

[147] For further analysis, see Lydia Olander, Tim Profeta, & Christopher Galik, *Sticking Points in Offsets Policy* (Nicholas Inst. Discussion Memo, June 7, 2010), *available at* http://nicholasinstitute.duke.edu/mitigationbeyondcap/sticking-points-in-offsets-policy/at_download/paper.

[148] *See* Raymond J. Kopp, *Role of Offsets in Global and Domestic Climate Policy* 1 (Resources for the Future, Issue Brief 10-11, 2010), *available at* www.rff.org/rff/documents/rff-ib-10-11.pdf.

[149] *See id*.

[150] EPA, EPA ANALYSIS OF THE AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009 3 (2009), *available at* http://www.epa.gov/climatechange/economics/pdfs/HR2454_Analysis.pdf.

[151] EPA, EPA ANALYSIS OF THE AMERICAN POWER ACT IN THE 111TH CONGRESS 3 (2010), *available at* http://www.epa.gov/climatechange/economics/pdfs/EPA_APA_Analysis_6-14-10.pdf.

[152] *See* REG'L GREENHOUSE GAS INITIATIVE, MIDWESTERN GREENHOUSE GAS REDUCTION ACCORD & W. CLIMATE INITIATIVE, ENSURING OFFSET QUALITY: DESIGN AND IMPLEMENTATION CRITERIA FOR A HIGH-QUALITY OFFSET PROGRAM 8 (2010) [hereinafter ENSURING OFFSET QUALITY].

[153] *Id.* at 10-11.

[154] *Id.* at 11-13.

[155] *Id.* at 13-14.

an offset as "permanent," which can range from 5-200 years according to the Intergovernmental Panel on Climate Change; EPA should follow the Panel's recommendation and require at least 100 years of carbon storage to be considered permanent.[156] Finally, enforceability requires that EPA create a mechanism to address the risks of carbon release from sequestration projects, and requires that EPA assign liability for a failure to fulfill offset requirements, either to the regulated entity (the buyer), the seller, or the system (via insurance-like programs).[157] EPA would have to clarify the definitions and minimum requirements for each criterion, but it has already done so for a variety of offset project types.[158] These fine-tuning measures also have precedent in the regional trading programs.[159]

Section 111 does not require that emissions reductions attributed to a source be made at that source, as discussed above.[160] The statutory silence, paired with the significant efficiency gains associated with offsets, should provide EPA with the discretion to conclude that offsets are part of the "best" system of emissions reduction.[161] In particular, EPA should emphasize that reductions of GHG emissions have the same environmental benefits regardless of whether they occur in the same locality as the regulated entity.

<u>EPA should assure that trading provisions are severable from the overall regulation.</u>

EPA's legal authority to allow trading of emissions credits is likely to be upheld in court. Nonetheless, EPA should ensure that any trading program is clearly severable from the rest of the regulation in order to minimize the legal risk from including trading provisions.

Whether a portion of a regulation is severable from the remainder "depends on the issuing agency's intent."[162] This inquiry turns on whether the agency would have taken the same approach with the rest of its rule if it knew that the relevant portion would be severed. A reviewing court will allow severance unless it finds "substantial doubt" that the agency would have adopted the remaining portion of the rule on its own.[163]

The D.C. Circuit has severed portions of regulations where the issuing agency has made it clear that the remaining portion was established independently and does not raise legal concerns. In *Davis County Solid Waste Mgmt. v. EPA*, the court highlighted that the remaining standard was "not in any way intertwined" with the vacated standard, and was "separately determined."[164] Similarly, in *Virginia v. EPA*, the court modified its initial decision, reinstating a portion of a vacated rule after concluding that EPA would have enacted the provision independent of the remainder of the rule.[165] The court also noted that the provision "will not give rise to the constitutional or statutory issues we identified in our opinion."[166]

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[156] *See* Olander, *supra* note 147, at 3.

[157] *See id.*

[158] EPA has developed Climate Leaders Offset Project Methodologies for the following project types: Captured Methane End Use, Commercial Boiler, Industrial Boiler, Landfill Methane, Manure Management: Anaerobic Digestor, Reforestation/Afforestation, and Transit Bus Efficiency. *See* EPA, *Greenhouse Gas Emissions: Project Methodologies*, *available at* http://www.epa.gov/climatechange/emissions.

[159] *See* ENSURING OFFSET QUALITY, *supra* note 152.

[160] *See supra* note 88 and accompanying text.

[161] *See supra* notes 47–49 and accompanying text.

[162] North Carolina v. FERC, 730 F.2d 790, 795–96 (D.C. Cir. 1984).

[163] *See* Davis County Solid Waste Mgmt. v. EPA, 108 F.3d 1454, 1459 (D.C. Cir. 1997).

[164] *Id.* (quotation marks omitted).

[165] 116 F.3d 499, 500 (D.C. Cir. 1997). The reinstated provision was unmentioned in the earlier case's briefs. *Id.*

[166] *Id.* at 500–01.

In contrast, in cases where the D.C. Circuit has denied severability, the issuing agency clearly intended to create an integrated, intertwined scheme. In denying severability for a comprehensive settlement in *North Carolina v. FERC*, the court noted that FERC had stated explicitly that it was "'not at all sure that we would order compensation [for one party] . . . apart from the agreement of the parties to this comprehensive settlement,'" adding in a footnote that the Commission believed "'compensation is not severable'" for individual parties.[167] In *North Carolina v. EPA*, the court found that "EPA has been quite consistent that [the Clean Air Interstate Rule] was one, integral action" and thus concluded that the regulation's trading program was not severable and vacated the entire rule.[168]

To ensure that trading provisions are severable, EPA should explicitly state that the trading provisions are discrete and severable from the emissions rate standard and that EPA would have issued an emissions rate standard on its own.[169] Furthermore, EPA should clearly describe how the overall scheme will function if the trading provisions severed. Courts do not want to attempt "to fashion a valid regulation from the remnants of the old rule."[170] Rule design is the responsibility of the agency, rather than the court. By clarifying how the regulation will operate if trading provisions are found invalid, EPA will ensure that trading provisions are severable from the remaining regulation.

6) EPA should allow borrowing against future emissions allowances.

Similar to banking, borrowing of allowances lets a source take emissions credits from future compliance periods, use the borrowed emissions credits ahead of schedule, and then reduce its emissions more substantially in later periods to reflect its prior consumption of emissions credits. Borrowing, like banking, gives sources the flexibility to reduce emissions at lower costs and can help limit price volatility.[171] Firms can better plan their investments in abatement and respond to market conditions more readily with this flexibility.

EPA should allow banking but ensure that these provisions are severable from the rest of the rule, because the efficiency benefits of borrowing provisions are paired with legal risks. Unlike banking, borrowing allows greater emissions in the near term in exchange for future reductions, which means that sources would be non-compliant with the EPA standard but for their promise to reduce emissions more deeply in the future.

EPA's own regulations require that state plans achieve emissions reductions "at least as quickly" as the federal baseline.[172] However, this requirement is not mandated by the statutory text. EPA could change this regulation for the purposes of GHGs in order to enhance the legal authority for emissions credit borrowing. EPA could then argue that states' authority to consider "other factors" under § 111(d) gives states discretion to allow borrowing based on a consideration of overall

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[167] 730 F.2d 790, 796 (D.C. Cir. 1984).

[168] 531 F.3d 896, 929 (D.C. Cir. 2008).

[169] *See id.* ("Severance and affirmance of a portion of an administrative regulation is improper if there is substantial doubt that the agency would have adopted the severed portion on its own.").

[170] *See* Nat'l Treasury Employees Union v. Chertoff, 452 F.3d 839, 867 (D.C. Cir. 2006); Harmon v. Thornburgh, 878 F.2d 484, 494 (D.C. Cir. 1989) ("[A]gency policy is to be made, in the first instance, by the agency itself—not by courts, and not by agency counsel.").

[171] *See* Fell et al., *supra* note 72, at 15.

[172] *See Prevailing Academic View*, *supra* note 117 (citing 40 C.F.R. § 60.22); *see also* 40 C.F.R. § 60.33b ("For approval, a State plan shall include emission limits for nitrogen oxides at least as protective as the emission limits listed in table 1 of this subpart for designated facilities.").

efficiency and the availability of future compliance periods, or that state use of borrowing is allowable under the flexible § 110 SIP-approach imported by reference into § 111(d).[173]

IV. EPA should set the NSPS based on a cost-benefit analysis.

EPA should perform a cost-benefit analysis (CBA) to determine the proper stringency for the emissions standard. The CBA should compare the costs of implementing available emissions reduction options to the benefits, including the avoided social cost of carbon as well as the many ancillary health benefits associated with decreasing the carbon intensity of power generation.

EPA should include all potential sources of cost-effective emissions reductions when evaluating the costs of implementation. As discussed above, available reduction options include on-site efficiency improvements, fuel switching, demand-side efficiency, and carbon capture and sequestration. EPA should consider the impacts of any included compliance flexibility mechanisms on compliance choices and costs.

EPA should improve its benefits estimate by furthering efforts to update the federal government's estimate of the social cost of carbon.[174] GHG emissions reduction is the most salient benefit of NSPS regulation. Consequently, an estimate of the social cost of carbon that reflects the latest scientific and economic research is an essential input into EPA's CBA. The federal government committed to update its social cost of carbon estimate by February 2012. EPA should continue its existing research into the economic impacts of climate change and support efforts by executive branch officials to meet the February 2012 deadline for updating the social cost of carbon estimate.

To maximize social welfare, the NSPS should be set to the level at which the marginal costs of abatement equal the marginal benefits. By basing its standard on a CBA that includes all potential emissions reduction opportunities as well as an up-to-date, accurate social cost of carbon estimate, EPA will set a standard that comes as close as possible to a socially optimal regulation given the limits on the agency's statutory authority.

The text of § 111 clearly authorizes EPA to use cost-benefit analysis to determine the standard for both new and existing sources. Section 111(a)(1) defines a standard of performance as "*the best system* of emission reduction which (*taking into account the cost* of achieving such reduction and any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated."[175] Moreover, the Supreme Court recently upheld the use of CBA in setting a standard under the Clean Water Act, 33 U.S.C. § 1326(b), in which the statutory authority to use CBA was considerably less clear than in § 111(a)(1).[176]

V. The § 111(d) guidelines should allow states broad latitude in designing "equivalent" regulatory programs.

Under § 111(d), EPA must issue guidelines requiring states to set emissions standards for existing sources.[177] EPA's guidance should include a minimum regulatory approach, preferably

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[173] 42 U.S.C. § 7411(d).

[174] Together with five other research and policy organizations, Policy Integrity recently called on senior executive branch officials to heed a commitment to update the federal government's estimate of the social cost of carbon by February 2012. A copy of the coalition's letter is available at: http://policyintegrity.org/documents/SCC_Senior_Gov_Official_Letter_2_28_11.pdf.

[175] 42 U.S.C. § 7411(a)(1) (emphasis added).

[176] *See* Entergy Corp. v. Riverkeeper, Inc., 129 S.Ct. 1498, 1508–09 (2009).

[177] 42 U.S.C. § 7411(d)(1).

incorporating the flexibility mechanisms described above but at least including a "standard of performance" representing the "degree of emission limitation achievable through the application of the best system of emission reduction."[178] States are required to establish plans for existing sources that achieve or exceed the requirements of EPA's guidelines and then to submit the plans to the agency for review.[179] States are allowed to propose an alternative regulatory approach as long as the approach qualifies as "equivalent" to the standard set by EPA in its guidelines. EPA retains authority to apply a default regulatory program if a state fails to submit a plan or if EPA does not approve the submitted plan.[180]

EPA should support state efforts to use flexible, market-based plans to meet the guidelines, as long as the submitted plans achieve emissions reductions as quickly as the EPA guidelines specify. The Supreme Court recently made clear that EPA's NSPS authority includes allowing state flexibility and creativity in meeting the federal standards. The Court stated that the § 111(d) provision "envisions extensive cooperation between federal and state authorities, generally permitting each State to take the first cut at determining how best to achieve EPA emission standards within its domain."[181]

Supporting flexible state approaches will be particularly vital if EPA decides to apply an overly conservative approach and use a CO_2e per MWh performance standard in its regulations for new sources and guidelines for existing sources. Allowing states to implement a variety of regulatory programs will create fifty laboratories for innovation,[182] where states can evaluate best practices and develop lessons learned to inform future, comprehensive regulatory and legislative approaches to address climate change.[183] Further, providing states with flexibility will allow states to design programs that are tailored to local conditions, increasing the potential for cost-effective emissions reductions.

Section 111(d) allows for state flexibility in developing regulatory programs. As discussed above, the provision specifically states that EPA "shall prescribe regulations which shall establish a procedure similar to that provided by section 110," recalling the federal-state approach used to develop State Implementation Plans for criteria pollutants.[184] While § 111(d) refers to the "procedure," rather than the substance of § 110, EPA has a strong argument that the cooperative, flexible § 110 approach imported by this language into § 111(d) allows EPA to grant states similarly broad discretion to experiment and innovate in their § 111(d) state plan submissions. Of particular note, § 110 allows state plans to include "economic incentives such as fees, marketable permits, and auctions of emissions rights."[185] Finally, § 111(d) directs EPA to permit states to take into consideration the remaining useful life of the source, "among other factors,"[186] giving states license to consider efficiency, flexibility, and other salutary concerns when developing their regulatory program.

While EPA has rarely had occasion to apply § 111(d), the few applications already set a precedent for state discretion to use flexible approaches. In particular, EPA's emissions guidelines for

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[178] 42 U.S.C. § 7411(a)(1).

[179] 42 U.S.C. § 7411(d)(1).

[180] 42 U.S.C. § 7411(d)(2).

[181] Am. Elec. Power Co. v. Connecticut, 131 S. Ct. 2527, 2539 (2011).

[182] *See* New State Ice Co. v. Liebmann, 285 U.S. 262, 311 (1932) ("It is one of the happy incidents of the federal system that a single courageous state may, if its citizens choose, serve as a laboratory; and try novel social and economic experiments without risk to the rest of the country.") (Brandeis, J., dissenting).

[183] *Cf.* Monast et al., *supra* note 49, at 8.

[184] 42 U.S.C. § 7411(d)(1).

[185] 42 U.S.C. § 7410(a)(2)(A).

[186] 42 U.S.C. § 7411(d)(1).

municipal waste combustors allow states to include emissions limits in "alternative formats" as long as the limits are "at least as protective" as those specified in the guidelines.[187]

EPA should ensure that meritorious existing state programs qualify as "equivalent."

EPA should take particular care to facilitate the certification of qualified existing state programs as equivalent. If an existing program will achieve reductions equal to or greater than those required by EPA's guidelines, EPA should allow the program to qualify as "equivalent" regardless of its particular format.

Allowing states to submit existing initiatives as their § 111(d) programs will avoid wastefully requiring covered entities to comply with two separate regulatory programs that seek the same objective. Avoiding duplicative regulation will further EPA's goal of making GHG regulation cost-effective and fair.[188]

A number of states are already applying programs that address GHGs from the power sector. All of these state and regional programs achieve GHG emissions reductions through methods other than rate-based standards, and in many cases—particularly the trading schemes—they are likely to achieve the reductions more efficiently. Existing programs include:

- Utilities-specific cap-and-trade programs: Eight states in the Northeast have established the Regional Greenhouse Gas Initiative, a cap-and-trade program covering carbon dioxide emissions from power plants.[189] While this program focuses on the utilities sector, emissions reductions may come from sources not directly covered by EPA's NSPS rulemaking, including demand-side efficiency programs and increased use of renewable energy. Also of note is that the program regulates only carbon dioxide emissions, rather than the range of GHGs covered by EPA's NSPS rulemaking.
- Economy-wide cap-and-trade programs: California regulations implementing the state's climate change legislation, A.B. 32, established a multi-sector cap-and-trade program for GHG emissions.[190] A number of western states and Canadian provinces are developing a similar multi-sector cap-and-trade program as part of the Western Climate Initiative.[191] Even more so than RGGI, these broad cap-and-trade programs will spur emissions reductions from a range of source categories beyond those covered by EPA's NSPS rulemaking.
- Scheduled retirement of coal-fired power plants: Colorado's Clean Air-Clean Jobs legislation incentivizes the decommissioning and replacement of older, inefficient coal-fired power plants.[192] Notably, while this program should result in an overall decrease in aggregate emissions from power plants, it should not affect the emissions rate of individual facilities that stay in operation.

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[187] EPA, *Municipal Waste Combustion: Summary of the Requirements for Section 111(d)/129 State Plans for Implementing the Municipal Waste Combustor Emission Guidelines* 1-6 (EPA-456R-96-003) (1996).

[188] EPA, News Release, *EPA to Set Modest Pace for Greenhouse Gas Standards / Agency Stresses Flexibility and Public Input in Developing Cost-Effective and Protective GHG Standards for Largest Emitters* (Dec. 23, 2010), *available at* http://yosemite.epa.gov/opa/admpress.nsf/d0cf6618525a9efb85257359003fb69d/d2f038e9daed78de8525780200568bec!OpenDocument.

[189] *See* Reg'l Greenhouse Gas Initiative, http://www.rggi.org.

[190] *See* Cal. Air Res. Bd., Assembly Bill 32: Global Warming Solutions Act, http://www.arb.ca.gov/cc/ab32/ab32.htm.

[191] *See* W. Climate Initiative, http://www.westernclimateinitiative.org/.

[192] Clean Air-Clean Jobs Act, COLO. REV. STAT. ANN. § 40-3.2-201-210 (West 2010).

- Renewable portfolio standards/efficiency standards: Many states have adopted standards that require utilities to ensure that a certain percentage of the electricity they provide comes from renewable sources or from energy efficiency improvements. Similar to scheduled retirements of power plants, this approach should result in an overall decrease in aggregate emissions from power plants, but it should not affect the emissions rate of individual facilities.

Many if not all of these existing programs serve to reduce the overall mass of GHG emissions, rather than regulating the rate of GHG emissions from individual sources. Thus, if EPA uses a rate-based emissions reduction requirement in its guidelines, the agency should create a consistent conversion formula in order to facilitate the comparison and certification of alternative approaches. To calculate the mass-based target that state programs must reach to qualify as "equivalent," EPA should sum the expected emissions from the affected sources within the state if they were to emit GHGs at the target rates, assuming business-as-usual utilization rates. To encourage banking and borrowing, EPA should ensure that its conversion formula can incorporate temporal compliance flexibility.

In addition, EPA should interpret the phrase "best system of emission reduction" to permit states to allow covered entities to reduce their emissions through actions taken at sources outside the covered categories. Many of the promising programs implemented by states allow or require emissions reductions from outside the power plant sector. This decision will also facilitate states' efforts to take advantage of the efficiency benefits associated with offsets.[193] EPA should not allow the efficient broadening of coverage to count against state programs.

Finally, EPA should make explicit that interstate agreements are an option for interested states. Several existing programs, including RGGI and WCI, allow for interstate trading of emissions, and EPA has applied interstate trading mechanisms in past regulations under both § 110 and § 111.[194] EPA should support interstate programs because they increase flexibility for compliance and allow regulated entities to comply in a more cost-effective manner.

EPA should grant states broad discretion to develop "equivalent" regulatory programs.

Similarly, for states developing new programs to address GHGs from the utilities sector, EPA should grant broad discretion to develop "equivalent" state regulatory programs to comply with § 111(d). EPA should certify as equivalent any state program that meets the emissions reduction schedule established by the agency.

In particular, if EPA takes an overly conservative approach and uses a traditional emissions rate standard as the baseline in its guidelines, many states may be interested in allowing regulated entities to "average" the emissions rate across sources through bubbling or emissions trading. Under this approach, a state would allow sources to comply if they could show that the average emissions rate across covered sources was the same as the overall required rate of emissions. As discussed above, this flexible approach would allow regulated entities to equalize the marginal cost of emissions reduction across multiple sources, thereby lowering the total cost of reductions.

EPA has allowed states to apply this type of flexible approach in the past. In its § 111(d) guidelines for large municipal waste combustors, EPA included a rate-based standard but explicitly permitted states to allow sources to average emissions from all designated facilities at a single plant to achieve

[193] For further discussion of policy and legal issues related to offsets, see Part III, *supra*.

[194] For further discussion of interstate trading, see Part III, *supra*.

compliance.[195] EPA can and should permit states to use averaging even more broadly, by allowing emissions trading among all sources regulated under the rule.

EPA should establish a simple process for determining the equivalency of a state plan to the federal regulations, with a focus on assuring that the state program achieves the GHG reductions at least as quickly as required by the regulations. EPA could facilitate state adoption of mass-based emissions reduction programs by converting the expected emissions reductions under the rate-based guidelines into a mass-based standard.[196] EPA should also incorporate temporal compliance flexibility into its conversion formula so that state efforts to regulate existing sources can allow for banking and borrowing of credits.

EPA should include a list of model regulatory options in its guidelines in order to inform and assist states in developing flexible plans.

EPA's guidelines should balance the need to support innovation while also providing information, guidance, and advice for states. While EPA's guidelines should encourage and stimulate creative state approaches, EPA should also take care to inform and assist states that may not have the resources to develop a new, innovative GHG regulatory program. EPA's guidelines can strike the right balance by including model market-based, flexible regulatory programs that states can adopt or modify to use as their state program. Since many states have minimal resources to develop thoughtful, efficient approaches to GHG regulation, EPA's provision of suggested options will ensure that each state has easily available, market-based options to consider in addition to the basic approach included in EPA's guidelines. Further, providing specific guidance could help lead states toward adopting compatible market-oriented approaches that can be linked into larger, interstate programs that are more robust and efficient.[197]

In the introduction of the model approaches, EPA should clarify that states have discretion to adopt the basic emissions rate approach, adopt one of the model approaches, or develop their own approach. Thus, the model approaches will support states' use of flexible regulatory programs without incurring the legal uncertainty associated with imposing specific approaches on the states.[198]

EPA's cost-benefit analysis should include a scenario that assumes all states will adopt the most efficient model regulatory option.

In its cost-benefit analysis of the proposed rule, EPA should include a scenario that evaluates the proposal's net benefits under an assumption that all states will adopt the most efficient equivalent regulatory scheme. Including formal consideration of state adoption of flexible programs will allow EPA to evaluate the proposal's costs and benefits in a realistic manner.

Recent experience suggests that states will indeed adopt the most efficient regulatory scheme if given the flexibility to do so. In the 1998 NO_x SIP call, EPA promulgated emissions reduction requirements for 21 states and the District of Columbia. All of the affected jurisdictions implemented cap-and-trade systems via their State Implementation Plans to meet the requirements, as EPA reported in a later rulemaking.[199] The § 111(d) requirements are likely to

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[195] *See* Emission Guidelines for Municipal Waste Combustor Metals, Acid Gases, Organics, and Nitrogen Oxides, 40 C.F.R. § 60.33b(d).

[196] For a more detailed discussion of this type of approach, see Jonas Monast, Tim Profeta & Brooks Rainey Pearson, *Pre-Workshop Paper: Regulating Greenhouse Gas Emissions from Existing Sources: Section 111(d) and State Equivalency* 7–10 (2011).

[197] *See* PEW CTR, *supra* note 119, at 8.

[198] *See id.* at 8–9.

[199] *See* CAMR, 70 Fed. Reg. 28,606, 28,617.

lead to states taking similar advantage of flexible compliance mechanisms under this rulemaking, and EPA should analyze this eventuality to gauge the likely costs and benefits of the rule.

VI. EPA should commit to an automatic phase-in of stronger standards.

EPA should commit to a predetermined schedule of incremental reductions in the mandated emissions allowances for new and existing sources. This approach would allow NSPS standards to reflect and foster emerging GHG reduction strategies, such as new efficiency technologies, new generation options, and carbon capture and sequestration. A predetermined schedule of emissions reductions would clarify future obligations and allow regulated entities to plan investments far in advance—a particularly salutary feature for the predetermined, capital-intensive investment pattern of the power industry.

Under § 111, EPA must set a "standard of performance" that reflects the "degree of emission limitation achievable through the application of the best system of emission reduction which . . . has been adequately demonstrated."[200] With respect to new sources, the D.C. Circuit has ruled that § 111 has a technology-forcing mandate and "looks toward what may fairly be projected for the regulated future, rather than the state of the art at present."[201] Thus, neither "adequately demonstrated" nor "achievable" means that the standard is limited to what can already be routinely achieved. While EPA cannot base standards on pure theory or speculation, it can make reasonable extrapolations of technological performance. An NSPS that prescribed future phases based on reasonable expectations of future technology could fall within EPA's discretion to interpret what is "adequately demonstrated."[202]

The mandate in § 111 that EPA consider costs also argues in favor of EPA discretion to establish a predetermined, incremental schedule.[203] If the agency were forced to set a single standard to govern for the foreseeable future, the standard would likely be more stringent at the outset and thus more costly. EPA can argue that setting a standard that increases in stringency over time is an allowable exercise of its discretion to consider costs.[204]

Under § 111(d), states also have authority to phase in stricter standards over time.[205] Section 111(d) refers to procedures in § 110, which require states to set "schedules and timetables for compliance."[206] Further, states are required to consider relevant factors under § 111(d), including the "remaining useful life of the existing source[s]."[207] One way for states to fulfill these statutory

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[200] 42 U.S.C. § 7411(a)(1).

[201] Portland Cement, 486 F.2d 375, 391 (D.C. Cir. 1973).

[202] *See* Lignite Energy Council v. EPA, 198 F.3d 930, 934 (D.C. Cir. 1999) (quoting Portland Cement, 486 F.2d at 391); Sierra Club v. Costle, 657 F.2d 298, 346 (D.C. Cir. 1981) (NSPS should "not stymie innovation. So long as EPA considers innovative technologies in terms of their prospective economic, energy, nonair health and environmental impacts the agency is within the scope of its authorized analysis."); Nat'l Asphalt Pavement Ass'n v. Train, 539 F.2d 775, 785–86 (D.C. Cir. 1976) ("adequately demonstrated does not mean that existing [facilities] must be capable of meeting the [new source] standard; to the contrary, 'section 111 looks toward what may fairly be projected for the regulated future, rather than the state of the art at present.'") (quoting Portland Cement, 486 F.2d at 391).

[203] 42 U.S.C. § 7411(a)(1) ("The term "standard of performance" means a standard for emissions of air pollutants which 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 nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." (emphasis added)).

[204] For further discussion, see *Prevailing Academic View*, *supra* note 117, at 9–10.

[205] *See id.*

[206] 42 U.S.C. § 7410(a)(2)(A).

[207] 42 U.S.C. § 7411(d)(1).

obligations would be to establish a timetable of gradually increasing stringency that accounted for both emerging technologies and the finite remaining life of in-state existing plants.

In the past, EPA has committed to phasing in increasingly stringent emissions limits under NSPS. CAMR's cap-and-trade program for new and existing sources, which was established as a "standard of performance" under § 111, included two phases and mandated a more stringent emissions limit in the second phase.[208] CAMR's first phase calculated its cap based only on emissions reductions achievable as co-benefits from the Clean Air Interstate Rule.[209] EPA asserted that information on mercury-specific technologies was "only adequate for us to conclude that such technologies are adequately demonstrated for use" in the second phase.[210] As a result, EPA factored additional reductions from use of mercury-specific controls into its calculation of the second phase cap, but not into calculations for the first phase.[211]

In the CAMR final rule, EPA stated that a two-phase approach was permissible for new sources under precedent that interpreted § 111(b) as "authoriz[ing] EPA to 'look toward what may fairly be projected for the regulated future, rather than the state-of-the-art at present.'"[212] For existing sources, EPA maintained that because § 111(d) afforded more flexible compliance deadlines, a two-phase approach was also permissible.[213] While the D.C. Circuit later vacated CAMR, the court ruled on unrelated grounds and did not address the legality of CAMR's two-phase approach under § 111.[214]

EPA has already overseen the successful phasing in of more stringent standards in the agency's point source standards under the Clean Water Act. Rather than grandfather existing sources, the Act required point sources to meet the best practicable technology standard by a date certain (1977), and the more stringent best achievable technology standard six years later (1983),[215] with limited exceptions reviewed on a case-by-case basis.[216] In an expansive study of water pollution regulation, EPA found that the point source standards had been a substantial success.[217] The same phased-in approach is appropriate and workable under the Clean Air Act.

Past precedent and the imperative that EPA consider costs in this rulemaking make clear that EPA can and should phase in stricter standards over time, both to comply with the letter of the statute and to best serve the underlying goal of achieving optimal levels of emissions reductions.

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[208] *See* CAMR, 70 Fed. Reg. 28,606, 28,607.

[209] *Id.* at 28,618.

[210] *Id.* at 28,617–18.

[211] *Id.* at 28,620–21 ("The EPA has . . . established a Phase II Hg emissions cap based on the reductions in Hg emissions founded in the CAIR program and reductions that can be reasonably obtained through the use of Hg-specific controls.").

[212] *Id.* at 28,620 (quoting Portland Cement Ass'n v. Ruckelshaus, 486 F.2d 375, 391 (D.C. Cir. 1973)).

[213] *Id.* ("We believe that EPA standards set under the authority of CAA section 111(d), where the compliance deadlines are not so immediate, afford EPA significant flexibility, commensurate with the amount of lead-time being given to affected sources.").

[214] *See* New Jersey v. EPA, 517 F.3d 574, 584 (D.C. Cir. 2008).

[215] 33 U.S.C. § 1311(b).

[216] *See* EPA v. Nat'l Crushed Stone Assoc., 449 U.S. 64 (1980).

[217] OFFICE OF WATER, U.S. EPA, PROGRESS IN WATER QUALITY: AN EVALUATION OF THE NATIONAL INVESTMENT IN MUNICIPAL WASTEWATER TREATMENT 3-47 (2000) ("Based on the systematic, peer-reviewed approach… this study has compiled strong evidence that the technology-based and water quality-based policies of the CWA for point source effluent controls have been effective in significantly reducing loads and improving [effluent levels].")

VII. Conclusion.

EPA should ensure that its NSPS regulations achieve the efficient amount of GHG emissions reductions in the most cost-effective manner possible, given statutory constraints. The agency has legal authority to apply a variety of strategies that will increase the efficiency of emissions reductions: regulating existing sources alongside new sources; regulating natural gas power plants alongside coal-fired facilities; incorporating compliance flexibility mechanisms; setting its standards based on a cost-benefit analysis; giving states broad discretion in designing flexible state plans for existing sources; and committing to an automatic phase-in of stronger standards. EPA should incorporate each of these opportunities into its final NSPS regulation.

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