

Federal Greenhouse Gas Control Options from an Enforcement Perspective

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Although numerous articles have been written about the various legislative and regulatory options available to control greenhouse gases, only a handful of these articles have focused on implementation and enforcement. Enforcement plays an essential role in the success of any environmental program. While many countries have well-written environmental laws that contain laudatory goals, only a few of these countries have the enforcement resources and expertise necessary to achieve the kind of results that the United States has been able to achieve. As the United States considers how best to address climate change, it is important to consider how the various legislative and regulatory options will be enforced so as to ensure that the ultimate objectives of the programs will be achieved.¹

As part of the University of San Diego Law School’s Second Annual Climate and Energy Law Symposium, we decided to review the enforcement provisions of the main federal greenhouse gas control options, with a view to drawing lessons from that review that could inform policy choices and program design. Our review suggests that there are relative strengths and weaknesses, as well important tradeoffs to be made, in the enforcement provisions of each of the leading candidate programs. Our review further suggests that some revisions should be made to these provisions to help ensure that the greenhouse gas control programs meet their environmental goals.

This paper is divided into three sections. Section I provides an overview of the main legislative and regulatory options being considered at the federal level to control greenhouse gases. These include cap-and-trade programs, carbon tax proposals, as well as existing authority under the Clean Air Act (“CAA”).² In Section II, we compare these options from an enforcement perspective, considering regulatory complexity, monitoring, reporting and verification, the roles of states and of citizens, transparency in government, and penalties, in order to tease out the

1. Enforcement also provides secondary benefits that should not be underestimated. A strong, transparent, and fair enforcement system contributes to the development and respect of the rule of law. It also provides citizens an opportunity to be involved in environmental improvement through citizen suits and complaints. Strong monitoring and reporting provisions can also help to inform the public about the extent and sources of greenhouse gases, which—beyond providing a basis for citizen suits and complaints—can exert its own pressure on sources to reduce emissions.

2. 42 U.S.C. §§ 7401–7671q.

important differences among the options and draw lessons for program design and implementation.³ Section III summarizes our conclusions.

I. OVERVIEW OF GREENHOUSE GAS CONTROL OPTIONS

Identifying viable federal greenhouse gas control options in 2010 is like playing whack-a-mole: the options seem to change daily because of shifting political winds blown by unpredictable factors like the economy and disasters such as the Deepwater Horizon oil spill. What has not changed, however, are the basic tools at the disposal of Congress and the Obama Administration to tackle greenhouse gas emissions: cap-and-trade systems, carbon taxes, and the provisions of the CAA. Accordingly, although the precise details of any eventual law or program may differ, we focus on these tools and outline their relevant provisions in this section.

A. *Cap-and-Trade Programs*

Several proposals for a cap-and-trade program have already been introduced in both the U.S. Senate and House of Representatives with varying degrees of success. Given their importance, below we provide an overview of how cap-and-trade programs are generally structured. We then explain the importance of enforcement in these programs, using the Acid Rain Program as an example. After this, we examine three cap-and-trade proposals that have received the most attention to date.

In a cap-and-trade program, a cap is set on the total amount of pollutants that can be emitted by regulated entities during a fixed compliance period. The cap is then divided into emission allowances and distributed, either through direct allocations or through an auction.⁴ Allowances are tradable, although there may be restrictions on who may buy or sell them. At the end of each compliance period, regulated entities must submit a sufficient number of allowances to cover their

3. We focus on civil penalties. The criminal provisions of the various options are beyond the scope of this paper.

4. See Lesley K. McAllister, *Putting Persuasion Back in the Equation: Compliance in Cap and Trade Programs*, 24 PACE ENVTL. L. REV. 299, 315 (2007) [hereinafter *Persuasion*]. For a more detailed description of cap and trade, see Pew Center on Global Climate Change & the Pew Center on the States, *Climate Change 101: Cap and Trade* (Jan. 2009), available at <http://www.pewclimate.org/docUploads/Cap-Trade-101-02-2008.pdf>.

emissions during that period.⁵ Regulated entities that have insufficient allowances are assessed penalties.

Because regulated entities have the option of trading allowances in order to meet their compliance obligations, a market for emission allowances is created. This market is particularly active where entities face varying costs to abate their emissions. Indeed, “[w]here costs are different, there is ‘room for a deal,’ as high-cost sources have the incentive to buy allowances from low-cost sources.”⁶ Costs can be further reduced by allowing the use of offset credits, which are emissions reductions from non-regulated sources that would not otherwise have occurred and that can be used by regulated sources to demonstrate compliance. A cap-and-trade program therefore provides regulated entities flexibility in achieving compliance obligations while reducing the overall costs of abating emissions.⁷

Although cap-and-trade programs use a market mechanism, they are in fact regulatory programs that need a rigorous enforcement system in place in order to properly develop.⁸ In the absence of such a system, regulated entities would be able to underreport their emissions, allowing them to submit fewer allowances than necessary to cover their emissions during the compliance period.⁹ This would lead to environmental objectives not being met: if emissions are underreported, “the cap may be reported as being met, but not be met in fact.”¹⁰ In addition, the market would not function properly. This is because regulated entities that underreport their emissions would be able to sell their excess allowances on the market, not only providing them with an unfair advantage, but also increasing the supply of allowances in the market. This, in turn, would inappropriately decrease the value of the allowances,

5. See Lesley K. McAllister, *The Overallocation Problem in Cap-and-Trade: Moving Toward Stringency*, 34 COLUM. J. ENVTL. L. 395, 398 (2009).

6. Stephanie Benkovic & Joseph Kruger, *To Trade or Not to Trade? Criteria for Applying Cap and Trade, Optimizing Nitrogen Management in Food and Energy Production and Environmental Protection: Proceedings of the 2nd International Nitrogen Conference on Science and Policy*, THE SCIENTIFIC WORLD 1, 3 (2001) [hereinafter *To Trade or Not to Trade*].

7. A. Denny Ellerman et al., *Emissions Trading in the U.S.: Experience, Lessons, and Considerations for Greenhouse Gases*, Pew Center on Global Climate Change i, iii (May 2003), available at http://www.pewclimate.org/global-warming-in-depth/all_reports/emissions_trading [hereinafter *Emissions Trading in the U.S.*].

8. See John Schakenbach et al., *Fundamentals of Successful Monitoring, Reporting, and Verification Under a Cap-and-Trade Program*, 56 J. AIR & WASTE MGMT. ASS'N 1576, 1578 (Nov. 2006) [hereinafter *Fundamentals*].

9. *Persuasion*, *supra* note 4, at 318.

10. *Id.*; see also *To Trade or Not to Trade*, *supra* note 6, at 3.

depriving other legitimate allowance holders some of the value of their emissions reductions.¹¹

At the same time, markets are built on the confidence that market participants have in the market itself. As the financial meltdown of 2008 showed, when any key element of a market loses participant confidence, the entire market can freeze or cease to function.¹² In order to instill confidence in the integrity of the market, a rigorous enforcement system, including appropriate monitoring, reporting and verification, is needed.¹³ A rigorous enforcement system instills confidence in the market “by verifying the existence and value of the traded allowance,”¹⁴ thereby allowing market participants to “manage the risks inherent in environmental projects and market-based programs.”¹⁵

Experience with the Acid Rain Program has shown that enforcement is essential to the success of a cap-and-trade program. The Acid Rain Program, which was established under Title IV of the 1990 Clean Air Act Amendments, requires the progressive reduction of SO₂ emissions from certain electric power utilities.¹⁶ Under the program, emissions of SO₂ are to be reduced to a level of 8.95 million tons annually, or approximately half of their 1980 levels, by 2010.¹⁷ The “centerpiece” of the Acid Rain Program is its cap-and-trade system.¹⁸ Similar to the basic

11. See *Persuasion*, *supra* note 4, at 318.

12. See generally Supplemental Notice for the Proposed National Emissions Standards for Hazardous Air Pollutants, 69 Fed. Reg. 12,398, 12,412–13 (Mar. 16, 2004) (codified at 40 C.F.R. pt. 60).

13. See, e.g., *id.* (consistent and efficient enforcement of rules is important for success of mercury trading market).

14. Lesley K. McAllister, *Beyond Playing “Banker”: The Role of the Regulatory Agency in Emissions Trading*, 59 ADMIN. L. REV. 269, 282 (2007) [hereinafter *Beyond Playing Banker*].

15. Kenneth J. Markowitz & Meredith R. Koparova, *Compliance Is Essential to the Environmental and Financial Integrity of Carbon Markets* in INECE Special Report on Climate Compliance 7 (Dec. 2009), available at <http://www.inece.org/climate/Special Report ClimateCompliance.pdf> [hereinafter *Compliance*].

16. 42 U.S.C. §§ 7651–7651o (1990). See EPA, *Clean Air Markets: Emission, Compliance, and Market Data*, http://www.epa.gov/airmarkets/progress/ARP_1.html (last visited Jan. 11, 2010) [hereinafter *Emission, Compliance, and Market Data*].

17. See EPA, *Clean Air Markets: SO₂ Reductions and Allowance Trading Under the Acid Rain Program*, <http://www.epa.gov/airmarkets/progsregs/arp/s02.html> (last visited Jan. 11, 2010) [hereinafter *SO₂ Reductions and Allowance Trading*]; see also Dallas Burtraw & Byron Swift, *A New Standard of Performance: An Analysis of the Clean Air Act’s Acid Rain Program*, 26 ENVTL. L. REP. 10,411, 10,413 (1996) [hereinafter *New Standard of Performance*].

18. See *SO₂ Reductions and Allowance Trading*, *supra* note 17.

structure of any cap-and-trade program, allowances are distributed to regulated entities, which are entitled to emit one ton of SO₂ for each allowance held. Allowances are freely tradable. At the end of each compliance period, regulated entities must submit a sufficient number of allowances to cover their emissions during that period or be assessed a penalty.

This SO₂ cap-and-trade program has been credited with achieving an “unprecedented level of environmental protection in a cost-effective manner.”¹⁹ In fact, a 2003 U.S. Office of Management and Budget study found that the “Acid Rain Program has accounted for the largest quantified human health benefits of any federal regulatory program implemented in the last 10 [years], with annual benefits exceeding costs by [greater than] 40 to 1.”²⁰ This program has been “widely recognized as a resounding success.”²¹

Several commentators have attributed the success of the Acid Rain Program to its rigorous enforcement system.²² Under the program, regulated entities are required to continuously monitor their SO₂ emissions, with most entities using continuous emissions monitoring systems (“CEMS”).²³ CEMS are required to record emissions data every 15 minutes.²⁴ These data, which must be consolidated and reported to the U.S. Environmental Protection Agency (“EPA”) on a quarterly basis, are considered to be “the ‘gold standard’ that backs up the currency of emission allowances.”²⁵ Indeed, CEMS have been “essential for accurately

19. *To Trade or Not to Trade*, *supra* note 6, at 1.

20. *Fundamentals*, *supra* note 8, at 1576; *see also* EPA, *Cap and Trade: Acid Rain Program Results*, <http://www.epa.gov/airmarkt/cap-trade/docs/ctresults.pdf> (last visited Jan. 20, 2010).

21. Jonas Monast, *Climate Change and Financial Markets: Regulating the Trade Side of Cap and Trade*, 40 ENVTL. L. REP. NEWS & ANALYSIS 10,051, 10,052 (Jan. 2010) [hereinafter *Financial Markets*].

22. *Compliance*, *supra* note 15, at 5 (stating that the success of the Acid Rain Program was a “direct result of the strong monitoring, reporting, and verification requirements”); *see also Emission Trading in the U.S.*, *supra* note 7, at 16.

23. *See* EPA, *Clean Air Markets: Acid Rain Program*, <http://www.epa.gov/airmarkets/progsregs/arp/basic.html#cem> (last visited Jan. 20, 2010). Thirty-six percent (36%) of these entities, which account for 96% of SO₂ emissions under the program, use CEMS. *See Persuasion*, *supra* note 4, at 319. The other entities determine their emissions through certain proxies. For example, units burning natural gas may determine emissions by multiplying the sulfur content of gas (measured by daily sampling and analysis) by the volume of gas combusted. *See* U.S. EPA, *Clean Air Markets: Continuous Emissions Monitoring Fact Sheet*, <http://www.epa.gov/airmarkets/emissions/continuous-factsheet.html> (last visited Mar. 3, 2010).

24. Byron Swift, *How Environmental Laws Work: An Analysis of the Utility Sector’s Response to Regulation of Nitrogen Oxides and Sulfur Dioxide Under the Clean Air Act*, 14 TUL. ENVTL. L.J. 309, 321 (2001) [hereinafter *Environmental Laws*].

25. Blas Perez Henriquez, *Information Technology: The Unsung Hero of Market Based Environmental Policies*, 152 RESOURCES 9, 11 (2004), available at http://www.rff.org/Publications/Resources/Documents/152/RFF_Resources_152_infotech.pdf.

quantifying [SO₂ emissions] and that accuracy in turn promotes smoothly operating markets and environmental integrity.”²⁶ At the same time, the program imposes severe penalties on entities that fail to comply with emission caps: for each ton of SO₂ emitted in excess of the cap, a regulated entity must pay a fine of \$2,000, well above the less-than-\$300 market value for a ton of SO₂.²⁷ In addition to paying a fine, entities must forfeit allowances from future years to cover their excess emissions, and may be subject to criminal and civil penalties. Penalties are assessed immediately and automatically.²⁸ As a result of these high penalties and strict monitoring, “there has been virtually 100 percent compliance with [the Acid Rain Program’s] emission [caps] with little need for enforcement action.”²⁹ This program therefore “shows that cap-and-trade schemes—with sufficient compliance and enforcement regimes—can deliver substantial environmental benefits at low costs.”³⁰

Recognizing the success of the Acid Rain Program, enforcement of a greenhouse gas program will likely pose unique challenges. In fact, there are likely to be several important differences between the Acid Rain Program and any greenhouse gas program that will likely make enforcement of greenhouse gas caps more challenging than enforcement of SO₂ caps. These include:

- The number of greenhouse gas pollutants being regulated;
- The number and variety of sources of these pollutants;
- The sophistication of the regulated sources with air pollution controls and markets; and
- The role of offsets.

In light of these differences, the manner in which the various greenhouse gas programs approach enforcement will likely have a significant effect on their success.

26. *Id.*

27. Clearing prices for SO₂ allowances have ranged widely, peaking at \$860 per ton and going as low as \$36 per ton. Clearing prices have averaged roughly \$300 per ton over the life of the Acid Rain Program. *See generally* <http://www.epa.gov/airmarket/trading/auction.html> (last visited Jan. 20, 2010).

28. *Environmental Laws*, *supra* note 24, at 403–04. From 1995 until 2004, only 23 units were found to be out of compliance, emitting 1,195 tons of excess emissions. The EPA assessed fines totaling \$3,856,513 for these violations. In addition, EPA has assessed fines totaling \$589,805 for nine monitoring violations. *See Persuasion*, *supra* note 4, at 321–22.

29. *New Standard of Performance*, *supra* note 17, at 10,422.

30. *Compliance*, *supra* note 15, at 5.

To review potential federal greenhouse gas cap-and-trade programs, we will focus on three cap-and-trade bills that have garnered the most attention to date: the American Clean Energy and Security Act of 2009 (“Waxman-Markey”),³¹ the discussion draft of the American Power Act (“Kerry-Lieberman”)³² and the Carbon Limits and Energy for America’s Renewal Act (“Cantwell-Collins”).³³ These bills have important differences that highlight how upfront program design may result in enforcement deficiencies that threaten a program’s environmental integrity.

1. The Waxman-Markey Bill

On June 26, 2009, the U.S. House of Representatives passed Waxman-Markey, which, among other things, establishes a cap-and-trade system to facilitate reductions in greenhouse gas emissions across most of the U.S. economy. Specifically, the bill requires the progressive reduction of greenhouse gas emissions from the entire economy so that:

- By 2012, emissions are reduced to 97% of 2005 levels;
- By 2020, emissions are reduced to 80% of 2005 levels;
- By 2030, emissions are reduced to 58% of 2005 levels; and
- By 2050, emissions are reduced to 17% of 2005 levels.³⁴

The bill sets forth similar emission reduction goals for regulated entities.³⁵ Under the bill, seven gases are designated as greenhouse gases: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), sulfur hexafluoride (SF₆), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF₃).³⁶ All greenhouse gases are measured in terms of their CO₂ equivalence value.³⁷ Entities regulated under the bill include, among others, electricity producers, greenhouse gas importers and stationary sources that emit 25,000 or more tons of CO₂ equivalence (“major GHG source”).³⁸

In order to achieve its emission reduction goals, Waxman-Markey establishes an emission allowance system, whereby a fixed number of

31. American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009) [hereinafter *Waxman-Markey*].

32. American Power Act, S. Discussion Draft, 111th Cong. (2010) [hereinafter *Kerry-Lieberman*].

33. Carbon Limits and Energy for America’s Renewal, S. 2877, 111th Cong. (2009) [hereinafter *Cantwell-Collins*].

34. *Waxman-Markey*, *supra* note 31, § 702.

35. *Id.* § 703.

36. In addition to these gases, EPA has the authority to designate any other anthropogenic gas as a greenhouse gas for purposes of the bill. *Id.* § 711(a).

37. *Id.* § 712.

38. *Id.* § 700(13).

allowances are distributed annually. Each allowance represents one ton of CO₂ equivalence value.³⁹ Regulated entities are required to hold a sufficient number of allowances at the end of each compliance period in order to cover their greenhouse gas emissions during that period.

In addition to holding emission allowances, regulated entities may also satisfy a part of their compliance obligations through the use of offset credits. Offset credits may be issued for projects or activities that would not otherwise have occurred and which avoid, reduce or sequester greenhouse gas emissions. Waxman-Markey limits the number of offset credits that may be used each year in lieu of emission allowances to two billion, with one offset credit equal to one emission allowance.⁴⁰

Under the bill, EPA is responsible for establishing an offsets program and must, among other things, promulgate regulations to ensure that offset credits represent verifiable, additional and permanent greenhouse gas reductions.⁴¹ EPA is also responsible for establishing a list of projects that will be eligible to generate domestic and international offsets.⁴² In order to protect the integrity of the offsets program, the bill creates an independent Offsets Integrity Advisory Board. The board is required to make recommendations to EPA for its use in promulgating regulations, as well as in other aspects of the program.⁴³

For offsets related to domestic agricultural and forestry sources, the U.S. Department of Agriculture (“USDA”), and not EPA, is given authority to establish an offsets program. Similar to EPA’s offsets program, Waxman-Markey requires USDA to ensure that credits generated under its offsets program represent verifiable, additional and permanent greenhouse gas reductions.⁴⁴ To this end, USDA is required to prepare a list of domestic agricultural and forestry practice types that are eligible

39. Initially, the majority of allowances will be distributed for free to entities identified under the bill. The remaining allowances will be auctioned in accordance with the guidelines set forth in the bill. Over time, the number of allowances that will be auctioned will begin to increase, with approximately 70% of allowances being auctioned by 2030. Pew Center on Global Climate Change, *At a Glance: American Clean Energy and Security Act of 2009*, available at <http://www.pewclimate.org/docUploads/Waxman-Markey-short-summary-revised-June26.pdf>.

40. *Waxman-Markey*, *supra* note 31, § 722(d)(1). This limit may be increased in certain circumstances. *Id.* Starting in 2018, entities will require 1.25 international offset credits for every emission allowance. *Id.*

41. *Id.* § 732(a), (b).

42. *Id.* § 733.

43. *Id.* § 731(a).

44. *Id.* § 502.

to generate offset credits.⁴⁵ The USDA is also required to establish its own advisory committee to provide scientific and technical advice on its offsets program, as well as to ensure the environmental integrity of the program.⁴⁶

Waxman-Markey allows emission allowances and offset credits to be freely traded.⁴⁷ Oversight of the allowance and offset market is the responsibility of the Federal Energy Regulatory Commission (“FERC”), while oversight of the derivatives market is the responsibility of the Commodities Futures Trading Commission (“CFTC”). In addition, the President is required to establish a working group, which is to include EPA and representatives of other “relevant” agencies, in order to make recommendations to CFTC regarding “proposed regulations for the establishment, operation, and oversight of markets for regulated allowance derivatives.”⁴⁸

The greenhouse gas provisions of Waxman-Markey are to be implemented and enforced through the existing system of CAA permits, specifically Title V operating permits.⁴⁹ EPA implements these requirements through the states: states adopt programs that are at least as stringent as the federal requirements and EPA certifies that the programs adhere to federal standards, thus authorizing the states to implement the CAA. This means that most regulated entities will submit permit applications to their state air authorities, which will implement and enforce these requirements. The major exception is that EPA will retain oversight of the central emissions and offset trading market through recording and tracking credits.⁵⁰

2. *The Kerry-Lieberman Bill*

Although Waxman-Markey passed the House of Representatives in the 111th Congress, the future of greenhouse gas control options in the Senate is highly uncertain. No cap-and-trade approach appears to have reasonable prospects of passage in the 112th Congress given the 2010 Congressional election results. Until mid-2010, the leading option was Kerry-Lieberman, which was released in discussion draft form on May 12, 2010. Kerry-Lieberman requires the progressive reduction of greenhouse gas emissions in order to meet certain economy-wide targets,

45. *Id.* § 503.

46. *Id.* § 531.

47. *Id.* §§ 724(a), 742, 508(b).

48. *Id.* § 401(c)(1).

49. *Id.* §§ 727, 835.

50. *See id.* § 724(d).

which are similar to those set forth in Waxman-Markey.⁵¹ In addition, Kerry-Lieberman designates substantially the same gases as greenhouse gases, regulates substantially the same entities and uses substantially the same emission allowance system as Waxman-Markey.⁵²

One of the salient differences between Waxman-Markey and Kerry-Lieberman relates to the offsets program. Like Waxman-Markey, Kerry-Lieberman allows regulated entities to satisfy part of their compliance obligations through the use of offset credits.⁵³ USDA and EPA are to share responsibility over the offsets program: USDA is responsible for administering the domestic agriculture and forestry offsets program, while EPA is responsible for administering the rest of the program.⁵⁴ Unlike Waxman-Markey, Kerry-Lieberman requires USDA and EPA to work together more closely in implementing their programs. For example, USDA and EPA are required to jointly: (1) establish the domestic offsets program;⁵⁵ (2) establish an advisory committee to provide scientific and technical advice regarding the domestic program;⁵⁶ and (3) promulgate regulations in order to implement the domestic program.⁵⁷

It is nonetheless important to note that, even though Kerry-Lieberman requires a joint effort between USDA and EPA in regards to domestic offsets, USDA still retains significant independent authority to implement the agricultural and forestry-related offsets program. Indeed, USDA is the “lead agency” for agricultural and forestry-related offset projects, and USDA alone establishes and maintains a list of projects eligible to generate offset credits,⁵⁸ approves offset projects,⁵⁹ and conducts random audits and reviews of those projects.⁶⁰

51. *Kerry-Lieberman*, *supra* note 32, § 702.

52. *Id.* §§ 700(12), 722(a). Certain entities, including industrial sources, will not be regulated until 2016. *See id.* § 722(c).

53. *Id.* § 722(d)(1)(A).

54. *Id.* § 733(c).

55. *Id.* § 733(a)(1)(A).

56. *Id.* § 732(a)(1).

57. *Id.* § 733(a)(1)(B).

58. *Id.* § 734(a)(1). USDA is required to provide an explanation if this list differs from the recommendations of the joint advisory committee. *Id.* § 734(a)(2).

59. *Id.* § 736(b).

60. *Id.* § 739. Kerry-Lieberman does, however, require audit protocols and guidelines to be jointly developed by EPA and USDA. *See id.* § 739(a).

3. *The Cantwell-Collins Bill*

Another option pending in the U.S. Senate is Cantwell-Collins, which was introduced on December 11, 2009.⁶¹ Similar to Waxman-Markey and Kerry-Lieberman, Cantwell-Collins requires the progressive reduction of greenhouse gases in order to meet certain economy-wide targets.⁶² These targets are the same as those set forth in Waxman-Markey and Kerry-Lieberman. In addition, under Cantwell-Collins, substantially the same gases are identified as greenhouse gases as under Waxman-Markey and Kerry-Lieberman.⁶³

In order to assist in meeting the economy-wide targets, Cantwell-Collins requires the Secretary of the Treasury (the “Secretary”) to establish by regulation a program within the Department of the Treasury (“Treasury”) to reduce greenhouse gas emissions.⁶⁴ This program is not explicitly tied to the economy-wide targets set forth in the bill. Indeed, under the program, the Secretary is only required to place a progressively declining limit on the amount of “fossil carbon” permitted to be sold into U.S. commerce.⁶⁵ As a result, the program captures CO₂ emissions and not any other greenhouse gas.⁶⁶ In addition, the emission reduction goals for fossil carbon are not clearly defined. Rather, Cantwell-Collins requires the President, in consultation with the Secretary, EPA and the Secretary of Energy, to establish the maximum quantity of fossil carbon, and the corresponding number of emission allowances (called “carbon shares” in the Act), that are permitted to be introduced into U.S. commerce starting in calendar year 2012. This quantity must equal “the approximate level of fossil carbon likely to be required” by the U.S. economy in that year and will remain at the same level for calendar years 2013 and 2014.⁶⁷ Then, starting in 2015, this quantity is to be

61. *Cantwell-Collins*, *supra* note 33.

62. *Id.* § 3.

63. Unlike Waxman-Markey and Kerry-Lieberman, Cantwell-Collins does not specifically designate NF₃ as a greenhouse gas. Cantwell-Collins does, however, include a provision similar to Waxman-Markey and Kerry-Lieberman that allows EPA to include “any other anthropogenically emitted gas that [it], after notice and comment, determines to contribute to climate change.” *Id.* § 2(12)(G).

64. *Id.* § 4(a)(1).

65. The term “fossil carbon” is defined as “(A) carbon in the form of a fossil fuel (such as coal, natural gas, and crude oil) in the raw state in which the fossil fuel exists at the time the fossil fuel is removed from the Earth; and (B) the carbon content of imported refined fuel products (such as gasoline, diesel, and jet fuels) derived from a fossil fuel.” *Id.* § 2(11).

66. The bill contains the “sense of the Senate” urging the federal government to take further actions to “decrease the risks associated with greenhouse gas emissions” from fossil carbon sources. *Id.* § 7(2).

67. *Id.* §§ 4(a)(2)(A)(ii), 4(a)(2)(B)(i).

reduced by 0.25% each year from the previous calendar year.⁶⁸ The President is entitled to modify this quantity in order to respond to certain factors set forth in the bill, but any such modification must be approved by Congress through a joint resolution.⁶⁹

Only “upstream” sources of fossil carbon are to be regulated under the program. Specifically, only “first sellers” are required to periodically surrender carbon shares to the Secretary.⁷⁰ First sellers are defined as entities that are “in the business of producing or importing fossil carbon or production process carbon, as determined by the Secretary.”⁷¹ Although the Secretary has the discretion to determine which entities are first sellers for purposes of the bill, it has been estimated that 2,000 entities would be regulated under such a program.⁷² First sellers are required to surrender carbon shares within two years after the date on which fossil carbon is introduced into U.S. commerce, combusted or released by a first seller, or transferred as a royalty-in-kind.⁷³

Cantwell-Collins establishes a fairly limited market for carbon shares. Each carbon share represents one ton of fossil carbon.⁷⁴ In order to obtain carbon shares, first sellers must purchase them from one of two sources: a monthly auction conducted by the Secretary, or a public carbon share exchange established and administered by the Secretary. The only entities eligible to participate in the auctions are first sellers.⁷⁵ Similarly, the only entities eligible to purchase carbon shares on the carbon share exchange are first sellers.⁷⁶ First sellers are prohibited from either directly or indirectly creating, purchasing, selling, or trading carbon share derivatives.⁷⁷ The Secretary, in consultation with CFTC, FERC, and the Federal Trade Commission (“FTC”), is nonetheless required to promulgate regulations to establish markets for carbon share

68. *Id.* § 4(a)(2)(B)(ii).

69. *Id.* § 4(a)(3)(C).

70. *Id.* § 4(a)(1)(B).

71. *Id.* § 2(10). The term “production process carbon” is defined as “the quantity of fossil carbon used to manufacture an energy-intensive commodity.” *Id.* § 2(14).

72. See Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 313 (2008) [hereinafter *Meaningful*]. Stavins refers to upstream regulation as regulation “at the point of fossil fuel extraction, import, processing, or distribution.” *Id.* at 309.

73. *Cantwell-Collins*, *supra* note 33, § 4(a)(1)(B) (2009).

74. *Id.* § 2(4).

75. *Id.* § 4(b)(2).

76. *Id.* § 4(b)(7)(A).

77. *Id.* § 4(b)(8)(A).

derivatives within one year of the bill's enactment. These regulations are to provide for effective and comprehensive market oversight; prohibit fraud, market manipulation and excessive speculation; and limit unreasonable or excessive fluctuations in the price of carbon shares and carbon share derivatives.⁷⁸

Cantwell-Collins further limits the market for carbon shares by largely eliminating offsets. Under the bill, only three types of offset activities are eligible to generate carbon shares: (1) carbon capture and storage facilities, (2) oil or gas re-injection projects, and (3) the manufacture of products with embedded fossil carbon.⁷⁹ Entities that receive carbon shares from these activities will be granted limited access to the public carbon share exchange for the purpose of selling their shares to eligible first sellers.⁸⁰ Information relevant to the transaction, including transaction dates, carbon share quantities, and prices, are to be made available to the public “on a real-time basis.”⁸¹

B. Regulating Greenhouse Gases Using a Carbon Tax

Another market-based approach to reducing greenhouse gas emissions is a carbon tax. Under a carbon tax, a fee is levied on each ton of CO₂ emitted or each ton of carbon contained in fossil fuels.⁸² The tax motivates regulated entities to reduce their emissions if the cost of doing so is less than the cost of paying the tax.⁸³ As a result, a carbon tax differs from a cap-and-trade program in a fundamental respect: a tax sets an “upper limit” on the costs of reducing emissions.⁸⁴ This creates certainty in regards to costs.⁸⁵ At the same time, unlike a cap-and-trade program, a carbon tax does not set an upper limit on the amount of emissions in a given year. Any reduction in emissions would therefore be dependent on whether, in that year, the costs of emission reductions were less than the carbon tax, leaving reductions subject to such variables as weather, availability of new carbon reduction technologies

78. *Id.* § 4(b)(8)(B).

79. *Id.* § 4(c).

80. *Id.* § 4(b)(7)(B).

81. *Id.* § 4(b)(7)(A).

82. U.S. CONG. BUDGET OFFICE, POLICY OPTIONS FOR REDUCING CO₂ EMISSIONS vii (2008), available at <http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf> [hereinafter *Policy Options*].

83. *Id.*

84. *Id.*; see also Reuven S. Avi-Yonah & David M. Uhlmann, *Combating Global Climate Change: Why a Carbon Tax is a Better Response to Global Warming Than Cap and Trade*, 28 STAN. ENVTL. L.J. 3, 36 (2009) [hereinafter *Better Response*].

85. *Better Response*, *supra* note 84, at 36.

and levels of economic activity.⁸⁶ This creates uncertainty in regards to the amount of greenhouse gases that will be emitted in a given year.

Although there are no carbon tax proposals pending in the U.S. Senate, a number of such proposals have been introduced in the U.S. House of Representatives. These include the Save Our Climate Act of 2009 (the “Save Our Climate Act”)⁸⁷ and America’s Energy Security Trust Fund Act of 2009 (“AESTFA”).⁸⁸ The Save Our Climate Act, which was introduced in the House on January 15, 2009, proposes to reduce CO₂ emissions by amending the Internal Revenue Code of 1986 (the “Code”) to impose an upstream tax on “taxable fuels.”⁸⁹ Under the bill, the term “taxable fuels” is defined to mean coal, natural gas, petroleum, and any petroleum product that is “extracted, manufactured or produced in the United States or entered into the United States for consumption, use, or warehousing.”⁹⁰ The tax starts at \$10 per ton of carbon content in the taxable fuel, increasing by \$10 each year until the second year after CO₂ emissions are reduced to 20% of 1990 levels.⁹¹ At that time, the tax will be frozen.⁹² The tax is to be imposed on manufacturers, producers and importers of taxable fuels at the time of sale.⁹³ The bill does, however, provide certain tax credits and exemptions. These include a credit for embedded or sequestered carbon, as well as an exemption for exports.⁹⁴ It should be noted that, unlike the cap-and-trade programs described above, the bill does not set forth a separate enforcement scheme, and presumably, the enforcement provisions of the Code would apply.

AESTFA, which was introduced in the House on March 5, 2009, is similar to the Save Our Climate Act. Like the Save Our Climate Act, AESTFA focuses on reducing CO₂ and not any other greenhouse gas.⁹⁵ It proposes to do so by amending the Code to impose an upstream

86. *Policy Options*, *supra* note 82, at ix.

87. Save Our Climate Act of 2009, H.R. 594, 111th Cong. (2009).

88. America’s Energy Security Trust Fund Act of 2009, H.R. 1337, 111th Cong. (2009).

89. Save Our Climate Act, *supra* note 87, § 3(a).

90. *Id.*

91. *Id.*

92. *Id.*

93. *Id.* The use of a taxable fuel by a manufacturer, producer or importer of such fuel is treated as a sale for purposes of the bill.

94. *Id.*

95. AESTFA, *supra* note 88, § 2(a).

tax on “taxable carbon substances.”⁹⁶ The term “taxable carbon substances” has the same definition as “taxable fuels.” The tax starts at \$15 per ton of CO₂ content of the taxable carbon substance, increasing each year by \$10.⁹⁷ Under AESTFA, EPA is required to set CO₂ emissions targets, which are to be designed so that, by 2050, carbon emissions are reduced to 20% of 2005 levels.⁹⁸ If the emissions targets are not met for a particular year, the tax will increase by \$15 instead of by \$10.⁹⁹ The tax is to be imposed on the same entities as the Save Our Climate Act, and like the Save Our Climate Act, AESTFA provides certain tax credits and exemptions. This includes a tax credit for “qualified offset projects.”¹⁰⁰ AESTFA defines “qualified offset projects” to mean projects carried out in the United States that: (1) reduce greenhouse gas emissions, (2) sequester greenhouse gases, or (3) destroy HFCs.¹⁰¹ AESTFA does not set forth a separate enforcement scheme.

C. Regulating Greenhouse Gases Under the Clean Air Act

Aside from a new legislative framework, traditional regulation under the CAA may also be used to control greenhouse gases. Indeed, as a result of the Supreme Court’s decision in *Massachusetts v. EPA*,¹⁰² EPA was required to make a determination whether to regulate greenhouse gases under the CAA. In responding to this decision, EPA determined that greenhouse gases endanger public health and the environment and that emissions of greenhouse gases from new motor vehicles endanger public health and welfare under CAA Section 202(a).¹⁰³ On April 1, 2010, EPA finalized the first greenhouse gas emission standards for motor vehicles under the CAA.¹⁰⁴

Recognizing that EPA has begun to regulate mobile sources of greenhouse gases under the CAA, this Article focuses on four provisions of the CAA that EPA could use, or could be compelled to use, to

96. *Id.*

97. *Id.*

98. *Id.*

99. *Id.*

100. *Id.* While AESTFA does not explicitly provide that offset projects are entitled to a tax credit, offset projects are included in the “Refunds or Credits” section of the bill.

101. *Id.*

102. *Massachusetts v. EPA*, 549 U.S. 497, 534 (2007).

103. Endangerment and Cause or Contribute Findings for Section 202(a) of the Clean Air Act, 79 Fed. Reg. 66, 496 (Dec. 15, 2009).

104. Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25,324 (May 7, 2010).

undertake comprehensive regulation of greenhouse gas emissions from stationary sources.¹⁰⁵ We review each of these provisions below.

1. Prevention of Significant Deterioration (PSD) Permits

The PSD permit provision of CAA Section 165 is the most likely CAA provision to be used to regulate greenhouse gas emissions from stationary sources. In fact, because EPA has begun to regulate greenhouse gases from motor vehicles under Section 202, it is now required to regulate those same pollutants under the PSD program for “major stationary sources.”¹⁰⁶ Major stationary sources are defined as those sources that emit more than 100 tons per year of any regulated pollutant or 250 tons per year of any combination of regulated pollutants.¹⁰⁷ The permits for sources exceeding these thresholds must contain emission limitations that meet best available control technology (“BACT”) standards.¹⁰⁸ Under the PSD program, new major facilities and modification of existing major facilities require both preconstruction review and permits.¹⁰⁹

Some concerns have been expressed about using the PSD program to regulate greenhouse gases. The primary concern is that the PSD thresholds, 100 and 250 tons per year, are far too low for greenhouse gases and would be easily crossed by both major and minor emitters.¹¹⁰ For example, previously unregulated sources such as “large office and residential buildings, hotels, [and] large retail establishments” would likely be subjected to PSD permit requirements if thresholds were left unaltered.¹¹¹ As such, the national administration of PSD permits would jump from between 200 and 300 per year into the thousands.¹¹² Such an

105. For a general discussion of regulating greenhouse gases under the CAA, see the Bush Administration’s Advanced Notice of Proposed Rulemaking “Regulating Greenhouse Gas Emissions Under the Clean Air Act,” 73 Fed. Reg. 44,354 (July 30, 2008).

106. 42 U.S.C. § 7475 (2010). The PSD program applies to pollutants regulated under any Clean Air Act authority, except sections 112 and 211(o).

107. *Id.* § 7479.

108. *Id.* § 7475.

109. *Id.*

110. See Brigham Daniels, Hannah Polikov, Timothy Profeta & James Salzman, *Regulating Climate: What Role for the Clean Air Act?*, 39 ENVTL. L. REP. 10,837, 10,840 (2009) [hereinafter *Regulating Climate*].

111. *Id.* at 10,840 n.31.

112. EPA, *Greenhouse Gas (GHG) Advanced Notice of Proposed Rulemaking (ANPR)*, PowerPoint Presentation, 51 (Sept. 18, 2008), http://www.epa.gov/air/caaac/pdfs/2008_09_GHGfull.pdf.

increase would likely create significant economic and logistical problems for those state environmental authorities responsible for imposing BACT standards on emitters.

In response to these concerns, a number of potential solutions have been suggested. EPA has tried to make clear that it will not immediately regulate stationary sources, and has published a revised timetable for industry compliance with greenhouse gas regulations.¹¹³ This timetable indicates that, during the first half of the 2011 calendar year, large stationary sources that are already regulated under the CAA for non-greenhouse gas emissions must address greenhouse gases in their permit applications.¹¹⁴ Other large stationary sources will not have to address greenhouse gas emissions until the latter half of 2011.¹¹⁵ In addition, using the “Tailoring Rule,” EPA has declared that the PSD threshold will not be 100 or 250 tons per year, but instead 75,000 to 100,000 tons of total greenhouse gases per year.¹¹⁶ It is important to note, however, that PSD regulation of greenhouse gases has aroused significant political opposition. It remains to be seen whether EPA’s attempts to tailor the PSD requirements to greenhouse gases will survive judicial and congressional scrutiny and whether EPA’s PSD authority over greenhouse gases will remain intact.

2. *New Source Performance Standards (NSPS)*

Another provision that may be used to regulate greenhouse gases under the CAA is the Section 111 NSPS program. Under Section 111, EPA may divide stationary sources into a variety of categories, called source categories. EPA can compel sources in each category to adopt certain technologies or to reduce emissions levels “to the functional equivalent of installing such a technology.”¹¹⁷ Such limitations are based

113. Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg. 17,004 (Apr. 2, 2010). *See also* Letter from Lisa P. Jackson, EPA Administrator, to Senator Jay D. Rockefeller, Senator from West Virginia (Feb. 22, 2010), *available at* http://epa.gov/oar/pdfs/LPJ_letter.pdf; Letter from Lisa P. Jackson, EPA Administrator, to Senator Lisa Murkowski, Senator from Alaska (Mar. 26, 2010), *available at* http://energytopic.nationaljournal.com/100326_jackson_to_murkowski.pdf.

114. Reconsideration of Interpretation of Regulations That Determine Pollutants Covered by Clean Air Act Permitting Programs, 75 Fed. Reg. 17,004, at 17,007 (Apr. 2, 2010).

115. *Id.*

116. The legal foundation for the agency’s revision of the statutory threshold has, however, raised significant questions. *See, e.g.*, Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 Fed. Reg. 31,514, at 31,533–49 (June 3, 2010).

117. *Regulating Climate*, *supra* note 110, at 10,839.

on best-demonstrated technology.¹¹⁸ EPA can also regulate existing sources by requiring states to evaluate their existing sources and submit a plan for regulating emitted pollutants.¹¹⁹ Regulation of existing sources is, however, restricted to those pollutants that are not already regulated by the NAAQS or NESHAP programs such as greenhouse gases.¹²⁰

The NSPS program is one of the preferred methods for regulating greenhouse gases under the CAA because it gives EPA a great deal of flexibility in defining source categories and in determining how each source category should be treated.¹²¹ The program gives the agency discretion to determine which sectors are regulatory priorities and how stringently each source category should be regulated.¹²² The agency may amend its source categories, thereby allowing it to distinguish between subsectors of a larger category or combine two similar sectors into one overarching category as a means of addressing both sources in a timely and cost-effective manner.¹²³ This enables EPA to tailor its regulations to particular sectors of the economy, which in turn ensures that specific technological, economic, and environmental considerations are taken into account. One further benefit of the NSPS program is the flexibility it affords EPA in terms of ratcheting up the stringency of previously issued regulations.¹²⁴

While there are many characteristics of the NSPS program to recommend its use for the regulation of greenhouse gases, a shortcoming of this approach is the length of time it takes for regulations to be promulgated and implemented. On average, it takes EPA between 18 months and two years to establish NSPS emission guidelines, and another one or two years before state-adopted standards are promulgated.¹²⁵

118. Franz T. Litz & Nicholas M. Bianco, *What to Expect From EPA: Regulation of Greenhouse Gas Emissions Under the Clean Air Act*, 40 ENVTL. L. REP. (ENVTL. LAW INST.) 10,460, at 10,482 (2010) [hereinafter *What to Expect*].

119. *Id.*

120. *Id.* The NAAQS and NESHAP programs are discussed in more detail below.

121. See EPA, TECHNICAL SUPPORT DOCUMENT FOR THE ADVANCED NOTICE OF PROPOSED RULEMAKING FOR GREENHOUSE GASES; STATIONARY SOURCES, for a general discussion of how NSPS requirements might apply to greenhouse gas sources, available at <http://www.epa.gov/climatechange/emissions/downloads/ANPRPreamble.pdf>; see also *Regulating Climate*, *supra* note 110, at 10,839.

122. *Id.*

123. *What to Expect*, *supra* note 118, at 10,482.

124. *Regulating Climate*, *supra* note 110, at 10,839.

125. *What to Expect*, *supra* note 118, at 10,483.

Past experience has shown that most states allow emitters three years to come into compliance.¹²⁶

Due to the vast array of greenhouse gas emitting sources, it may take EPA a significant amount of time to methodically develop regulations for each of its source categories.¹²⁷ Some categories will face regulation long before others.¹²⁸ The unique nature of greenhouse gases—most of which result from the combustion of fuels—may, however, simplify implementation to some degree. The NSPS may be based on changing the type of fuel burned or by imposing energy efficiency standards. As such, NSPS for greenhouse gases may not be as cumbersome as traditional NSPS promulgation.

An intriguing possibility is that EPA could establish a cap-and-trade program using CAA Section 111. Indeed, there is some precedent for this: in 2005, EPA established a mercury trading program under Section 111. Although the program was struck down by the D.C. Circuit, the court's decision was not based on grounds that called into question the permissibility of establishing trading under Section 111.¹²⁹ Nevertheless, even if EPA were able to use NSPS to establish a greenhouse gas cap-and-trade system, such a system could have several significant limitations. This includes an inability to allow trading between source categories and an inability to allow the use of offsets.¹³⁰ Also, the time required to implement the program is an issue. While EPA started working on the mercury trading program in 2001, it has yet to implement the program, and even if EPA remains committed to the program, it appears that it could take several more years to implement.

3. National Ambient Air Quality Standards (NAAQS)

A third provision that may be used to regulate greenhouse gases under the CAA is the NAAQS program (CAA Sections 108-110). Under this program, EPA has the authority to identify criteria air pollutants and set limitations on the concentration of each pollutant in the ambient air.¹³¹ The program was implemented in order to regulate air pollutants such as smog, whose concentrations were locally significant. As a result, the NAAQS program requires the ambient air quality in small geographic

126. *Id.*

127. Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, at 44,368 (July 30, 2008).

128. *Id.*

129. *New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008). Instead, the court ruled that EPA impermissibly removed mercury from regulation as a hazardous air pollutant under Section 112.

130. *What to Expect*, *supra* note 118, at 10,482.

131. 42 U.S.C. §§ 7408–11 (2008).

areas within each state to be measured. Air quality is improved through the execution of state implementation plans (“SIPs”).

While the regulation of greenhouse gas emissions is possible under the NAAQS program, such a regulatory scheme would have significant drawbacks.¹³² In contrast to the local pollutants that are typically regulated under the program, greenhouse gases are spread uniformly throughout the earth’s atmosphere.¹³³ States would therefore find it next to impossible to reduce greenhouse gases within their airshed by merely employing a SIP.¹³⁴ Also, if EPA did regulate greenhouse gases under the NAAQS program, it would not be able to regulate existing greenhouse gas sources under the NSPS program, which would strip that program of much of its utility as a greenhouse gas regulatory option.¹³⁵ Although some commentators have proposed interesting methods for using NAAQS and SIPs to tackle climate change,¹³⁶ the tools and nature of the program make it unlikely to be used by EPA to control greenhouse gas emissions.¹³⁷

132. *See generally* Regulating Greenhouse Gas Emissions Under the Clean Air Act, 73 Fed. Reg. at 44,367–68.

133. *What to Expect*, *supra* note 118, at 10,838.

134. *Id.*

135. Regulating Greenhouse Emissions Under the Clean Air Act, 73 Fed. Reg. 44,354, at 44,485 (proposed July 30, 2008).

136. *See, e.g.*, Thomas D. Peterson, Robert B. McKinstry, Jr. & John C. Dernbach, *Developing a Comprehensive Approach to Climate Change Mitigation Policy in the United States: Integrating Levels of Government and Economic Sectors*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,711, at 10,733–34 (Aug. 2009). *But see*, Robert Brenner & Anna Marie Wood, *Comment on Developing a Comprehensive Approach to Climate Change Mitigation Policy in the United States: Integrating Levels of Government and Economic Sectors*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,723 (Aug. 2009); Michael Gerrard, *Comment on Developing a Comprehensive Approach to Climate Change Mitigation Policy in the United States: Integrating Levels of Government and Economic Sectors*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,727 (Aug. 2009); Gary Guzy, *Comment on Developing a Comprehensive Approach to Climate Change Mitigation Policy in the United States: Integrating Levels of Government and Economic Sectors*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,730 (Aug. 2009); Raymond B. Ludwiszewski & Charles H. Haake, *Comment on Developing a Comprehensive Approach to Climate Change Mitigation Policy in the United States: Integrating Levels of Government and Economic Sectors*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,732 (Aug. 2009).

137. *See* Robin Bravender, *Groups Back Petition to Spur National CO₂ Standard*, GREENWIRE, Dec. 21, 2009 (quoting EPA Administrator Jackson as saying she and EPA have “never believed that getting a national ambient air quality standard for greenhouse gases was advisable”).

It is nonetheless conceivable that EPA could be compelled to use the NAAQS program through a combination of petitions and lawsuits from third parties. In fact, several environmental groups have petitioned EPA to take this approach.¹³⁸ And, EPA was compelled to regulate lead under the NAAQS program despite significant Agency reluctance.¹³⁹

4. National Emission Standards for Hazardous Air Pollutants (NESHAP)

A fourth option for regulating greenhouse gases under the CAA is the NESHAP program (CAA Section 112). This program enables EPA to list pollutants that create “a threat of adverse human health effects” or harmful environmental impacts.¹⁴⁰ If EPA lists one or more greenhouse gas under Section 112, it must also list all categories of major sources.¹⁴¹ Under this provision, major sources are defined as those sources that emit or may potentially emit 10 tons per year of any one hazardous air pollutant or 25 tons per year of any combination of hazardous air pollutants.¹⁴² Any pollutants that EPA lists under this program must be treated by maximum achievable control technology standards.¹⁴³

Like NAAQS, the NESHAP program is an unlikely regulatory path for controlling greenhouse gases from stationary sources.¹⁴⁴ This is because “[S]ection 112 ‘appears to allow EPA little flexibility regarding either the source categories to be regulated or the size of the sources to regulate . . . EPA would be required to regulate a very large number of new and existing stationary sources, including smaller stationary sources.’”¹⁴⁵ In addition, the NESHAP program requires new sources to come into compliance immediately and existing sources to come into compliance within three to four years, which leaves little time for technological innovation.¹⁴⁶

In light of the foregoing, it is clear that relying on traditional CAA regulation is not the ideal option for controlling greenhouse gases. In the absence of a federal legislative framework, it may, however, be the only available option.

138. *Id.*

139. Nat’l Res. Defense Council, Inc. v. Train, 545 F.2d 320, 324 (2d Cir. 1976).

140. 42 U.S.C. § 7412(b)(2).

141. Regulating Greenhouse Gas Emissions Under the Clean Air Act, *supra* note 135, at 44,368.

142. 42 U.S.C. § 7412(b).

143. *Id.*

144. *See generally* Regulating Greenhouse Gas Emissions Under the Clean Air Act, *supra* note 135.

145. *Id.*

146. *Id.*

II. COMPARING ENFORCEMENT ASPECTS OF CONTROL OPTIONS

Given the numerous options for regulating greenhouse gases, it is important to assess each of these options. The most important criterion in this assessment is environmental effectiveness—whether the option results in the desired emissions reductions. Other factors are important as well, such as the efficiency of the option and its likely durability in the face of changing circumstances. As summarized in Table 1, in this section we compare several aspects of enforcement that will impact the effectiveness of the various greenhouse gas control options. This comparison suggests that, while many proposed programs have the main elements in place to be effectively enforced, all have some weaknesses that may hinder their ultimate environmental effectiveness.

TABLE 1. SUMMARY OF ENFORCEMENT PROVISIONS OF GREENHOUSE GAS CONTROL PROGRAMS

Program	Regulatory Complexity	No. and Variety Sources	MRV*	Transparency	Role Citizens	Role States	Penalties
Waxman-Markey & Kerry-Lieberman	High	7,500 major GHG sources	Detailed	High, with some exceptions	Citizen suits	Joint role with EPA	High
Cantwell-Collins	Medium	2,000 fossil fuel sellers	None	Low	None	None	High
Carbon Tax	Low	2,000 fossil fuel sellers	None	Low	None	None	Medium
CAA NSPS or PSD programs	High	Tens of thousands economy wide	Detailed	Medium	Citizen suits	Primary role	Medium
CAA Section 111 cap-and-trade**	High	10,000 major GHG sources	Detailed	High	Citizen suits	Joint role with EPA	Medium

* Monitoring, reporting and verification.

** A theoretical CAA Section 111 cap-and-trade system created by EPA using its final rule for Mandatory Reporting of Greenhouse Gases as a model of the monitoring, reporting and verification requirements.

A. Regulatory Complexity

The various greenhouse gas control options differ in their regulatory complexity. Among the options, Waxman-Markey, which splits regulatory authority among four federal agencies, creates several new administrative

bodies and calls for 145 new rulemakings, is the most complex. This will likely give rise to some enforcement challenges. While Kerry-Lieberman has a similar regulatory structure to Waxman-Markey, it takes a different approach to certain key issues, rendering it more manageable. Compared to Waxman-Markey and Kerry-Lieberman, Cantwell-Collins and the carbon tax proposals offer less complexity, but this comes at the cost of reduced flexibility for regulated entities in meeting their compliance obligations. At the same time, it is not yet clear how complex regulation will be under the CAA, as this will depend in large part on how EPA decides to implement a greenhouse gas program under the statute.

Regulatory complexity is a double-edged sword. On the one hand, a highly complex program may result in a more efficient system. For example, by creating an almost economy-wide approach to greenhouse gas controls, a highly complex cap-and-trade program may allow trading across sectors and offsets to be used, thus decreasing implementation costs for the regulated community. At the same time, such complexity gives rise to numerous implementation and enforcement problems. Program design must, therefore, strike a balance between complexity, flexibility, and ability to implement. In considering regulatory complexity, we evaluate two different elements: (1) agency expertise and coordination; and (2) the amount of time and resources needed to implement the program.

1. Agency Expertise and Coordination

The expertise of the agency selected to implement a greenhouse gas program will affect the enforcement and effectiveness of that program. A review of the various greenhouse gas control options reveals that some questionable decisions have been made in regards to which agency will implement them. Among the various options, Waxman-Markey is the most problematic. The bill bears the scars of its passage in the House of Representatives: in order to mollify certain concerns over committee jurisdiction and EPA control over agricultural interests, the bill's sponsors gave significant roles to USDA and FERC. As a result, Waxman-Markey splits authority to oversee the greenhouse gas cap-and-trade program among four federal agencies: EPA, USDA, FERC and CFTC. Each agency is charged with regulating a different aspect of the program. The EPA is in charge of distributing emission allowances and managing the offsets program, except that the portion of the offsets program relating to domestic agricultural and forestry sources is to be managed by USDA. At the same time, regulation of the emission allowance and offset credit market is to be overseen by two other federal agencies, FERC and CFTC.

The role assigned to FERC is highly problematic. At present, FERC is responsible for regulating the interstate transmission of natural gas, oil, and electricity, as well as regulating natural gas and hydroelectric projects.¹⁴⁷ This is a stark contrast to the role that FERC would be playing under Waxman-Markey, where it will be required to regulate the greenhouse gas allowance market—a commodity market among industries that span the U.S. economy. While the energy industry is likely to be highly involved in the market, many participants will not be in this industry. Thus, there is no clear fit between FERC’s expertise and its oversight of a national greenhouse gas market. Indeed, the Chairman of FERC has himself publicly questioned whether his agency is well-suited to regulating this market.¹⁴⁸

In addition, the prominent role given to USDA in implementing the agricultural and forestry offset program under Waxman-Markey is highly problematic.¹⁴⁹ USDA has traditionally viewed farmers as its “constituents,”¹⁵⁰ and has stated that part of its mission is to promote the economic well-being of farmers and expand their markets.¹⁵¹ The vision of USDA is “to be recognized as a dynamic organization that is able to efficiently provide the integrated program delivery needed to lead a rapidly evolving food and agriculture system.”¹⁵² Under Waxman-Markey, USDA is in charge of determining the environmental sufficiency of agricultural and forestry offsets. Query whether an agency focused on supporting and promoting the American farmer would have the motivation and expertise to design, implement and enforce an environmentally rigorous offset system that promised to lavish billions of dollars on its “constituents.” While it is true that USDA has more expertise in farming

147. FERC, About FERC—What FERC Does, <http://www.ferc.gov/about/ferc-does.asp> (last visited Oct. 31, 2010).

148. Peter Behr, *FERC: An Energy Overseer May Have the Clout to Umpire Emissions Trading*, CLIMATE WIRE, Apr. 2, 2009, <http://www.eenews.net/climatewire/2009/04/02/archive/8>.

149. Christa Marshall, *Offsets: New Ag Language in Climate Bill Riles Enviro Groups*, CLIMATE WIRE, June 26, 2009, <http://www.pacificforest.org/news/Media%20Clips%20PDF/Climatewire-ACES-6-26-09.pdf>; Allison Winter, *Farm Groups Prevail as House Bill Puts USDA in Charge of Ag Offsets*, N.Y. TIMES, June 24, 2009, available at <http://www.nytimes.com/cwire/2009/06/24/24climatewire-farm-groups-prevail-as-house-climate-bill-pu-24287.html>.

150. See generally USDA, www.usda.gov (last visited Oct. 31, 2010).

151. See USDA Mission Statement, <http://www.usda.gov/wps/portal/usda/usdahome> (last visited Oct. 31, 2010).

152. *Id.*

than EPA, USDA does not have a solid track record of determining the sufficiency of environmental programs, which EPA does. There is a significant risk that the integrity of the U.S. offset system could be called into question should EPA and USDA take significantly different approaches to creating offsets or should one agency be viewed as inadequately ensuring the environmental integrity of offsets.

Although Kerry-Lieberman takes a largely similar approach to agency authority as Waxman-Markey, there are certain differences between the two bills that may offer some solutions for the split in authority among agencies. To start, Kerry-Lieberman does not give FERC any authority to oversee the greenhouse gas market, but places oversight of the market solely into the hands of the agency expert in market regulation: CFTC.¹⁵³ This will likely improve implementation and enforcement of the program. At the same time, Kerry-Lieberman takes a somewhat different approach to the split authority under the domestic offsets program. While EPA and USDA are still responsible for different aspects of the program, the two agencies are required to jointly establish the program.¹⁵⁴ This includes jointly selecting an advisory committee to provide scientific and technical advice regarding the domestic offsets program, as well as jointly promulgating regulations to implement the program.¹⁵⁵ This approach could go a long way in ameliorating concerns about two separate sets of regulations. It does, however, leave some room for concern because enforcement will still be left in the hands of each agency. As a result, it is still possible that one agency could demand strict compliance with the regulations while the other took a more permissive approach.

The other greenhouse control options also make some questionable decisions in regards to implementing agencies. Cantwell-Collins gives oversight of its greenhouse gas program to Treasury. While it makes some sense to draw on Treasury's expertise in collecting taxes and regulating financial markets and instruments, Treasury has no prior experience with implementing pollution control programs. It is troublesome that Treasury will need to evaluate the environmental effectiveness of carbon capture and storage, reinjection facilities, and carbon embedded in manufactured products, as well as investigate and account for leakage, verify additionality, and make other technical decisions about the offset program. This is also true of the carbon tax proposals, which give the IRS—a bureau of Treasury—authority over their greenhouse gas programs. While the IRS is a logical choice to collect taxes, query whether the

153. *Kerry-Lieberman*, *supra* note 32, § 2402(a)(2).

154. *Id.* § 733(a)(1)(A).

155. *Id.* §§ 732(a)(1), 732(b), 733(a)(1)(B).

agency will be able to oversee the environmental effectiveness of the offsets envisioned under AESTFA.

In addition to agency expertise, agency coordination is an important aspect of enforcement. Coordination is required to ensure that each agency receives the information that it needs to carry out its responsibilities. This is likely to be an issue under Waxman-Markey. Although each of the four implementing agencies is given a distinct role in regulating the greenhouse gas program, the agencies will likely need to establish information-sharing protocols and enter into memoranda of understanding in order to properly coordinate their roles. For instance, FERC and CFTC will need information from EPA regarding distribution of emission allowances, as well as certification of offset credits in order to properly regulate the emission allowance and offset credit market. At the same time, coordination is needed to ensure that the program is consistently administered. Waxman-Markey requires each agency to promulgate its own regulations. Although the bill sets forth general requirements for these regulations, the details are largely left to each agency's discretion. This may lead to regulations being inconsistently promulgated and enforced.¹⁵⁶

Kerry-Lieberman addresses some of these issues by explicitly requiring the implementing agencies to coordinate their activities. Specifically, the bill requires various federal agencies, including EPA, USDA and CFTC, to enter into a memorandum of understanding within one year after Kerry-Lieberman is enacted in order to establish procedures to, among other things, "share information that may be requested for enforcement, surveillance, or such other purposes within the scope of the jurisdiction of the requesting agency."¹⁵⁷ Although the agencies will still need to work out the details of any information sharing, requiring the agencies to complete this work by a date certain will likely facilitate coordination among the various agencies and, in turn, simplify enforcement.

156. Waxman-Markey does attempt to provide some coordination among the agencies. For example, under Section 531 of the bill, the advisory committee for USDA offsets program is required to "coordinate its activities with those of any other [f]ederal advisory committees working in related areas" and to "consult with, and be informed by the views of" the advisory committee for EPA offsets program. These provisions presumably provide an opportunity for USDA to coordinate some of its offset program activities with those of EPA, but the details have been left to the agencies to determine. These details will need to be worked out and put in place in order to ensure proper coordination and, in turn, proper enforcement of the cap-and-trade program.

157. *Kerry-Lieberman*, *supra* note 32, § 2415.

Cantwell-Collins further simplifies enforcement of a greenhouse gas control program by placing its administration largely into the hands of one agency. As noted above, the Secretary is in charge of establishing a program to reduce greenhouse gas emissions.¹⁵⁸ The Secretary is also required to, among other things, conduct periodic auctions of the allowances,¹⁵⁹ distribute allowances for certain offset activities,¹⁶⁰ and—in consultation with CFTC, FERC and the FTC—promulgate regulations to establish, operate, and oversee any derivatives markets.¹⁶¹ The advantage of this approach is that, unlike Waxman-Markey and Kerry-Lieberman, it does not split administration of the program among several agencies. It is therefore less likely that there will be issues of coordination or inconsistency in promulgating and enforcing regulations—issues that are likely to arise under Waxman-Markey and, to a lesser extent, Kerry-Lieberman.

Similar to Cantwell-Collins, the carbon tax proposals and regulation under the CAA also rely on one implementing agency. This will decrease coordination issues significantly. Compared to a carbon tax, however, traditional CAA authority is more complex, because state agencies are involved in implementing and enforcing these programs. Because states must align their programs with any changes made at the federal level, there is often a significant time delay in translating federal mandates into on-the-ground requirements.¹⁶² Further, there may be disputes between EPA and states over regulatory interpretation, stringency of standards and enforcement matters.¹⁶³

2. Amount of Time and Resources to Implement

The amount of time and resources needed to implement a greenhouse gas control program affects the enforcement and effectiveness of that program. Indeed, the more time and resources needed to create the program, the more opportunity there will be for disruptions in the implementation process from such factors as litigation and lack of

158. *Cantwell-Collins*, *supra* note 33, § 4(a)(1).

159. *Id.* § 4(b)(1).

160. *Id.* § 4(c).

161. *Id.* § 4(b)(8)(B).

162. *See, e.g.*, Robin Bravender, *EPA Tailoring Rule Creates Challenge for State Regulations*, GREENWIRE, June 2, 2010 (some states likely unable to modify regulations to comply with EPA GHG rule within one year).

163. For example, EPA has had an ongoing dispute with Texas over the stringency of its air permitting program. *See* Naureen S. Malik, *EPA Rejects Texas Flexible Air-Quality Permit Authority*, WALL ST. J., June 30, 2010, available at <http://online.wsj.com/article/SB10001424052748703426004575339140408652292.html>.

sufficient resources. In considering this aspect, there is a stark difference among the various greenhouse gas control options.

To start, Waxman-Markey is likely to require the most amount of time and resources to implement. The bill is by far the most complex and detailed of the pending legislative proposals.¹⁶⁴ To implement its greenhouse gas reduction provisions, EPA alone would need to undertake at least 33 rulemakings.¹⁶⁵ EPA rulemakings often take several years to be worked into final rules, which then face several additional years of court challenges. And, once all judicial review is complete, it will take many years to actually implement these provisions. This regulatory structure, which is largely the same for Kerry-Lieberman, is likely to lead to significant implementation challenges.

In contrast to Waxman-Markey and Kerry-Lieberman, Cantwell-Collins offers a more simple approach. It avoids many of the most controversial and complex aspects of the other cap-and-trade bills by limiting the number of sources regulated and focusing on just carbon, not several greenhouse gases. In addition, it has a more streamlined regulatory approach, including limited opportunities to utilize offsets. Still, Cantwell-Collins requires a new regulatory structure within Treasury. This will take time and will likely face litigation challenges. Accordingly, while Cantwell-Collins' regulatory structure is likely to lead to less implementation challenges than Waxman-Markey and Kerry-Lieberman, it does not eliminate all of them.

The carbon tax proposals will likely require the least amount of time and resources to implement. Unlike the cap-and-trade approaches, implementation of a carbon tax will not require new regulatory structures. For example, many of the entities that would be covered under an upstream tax like that proposed in the Save Our Climate Act and AESTFA are already subject to excise taxes.¹⁶⁶ The same structures that are used for collecting excise taxes could also be used for collecting

164. See Michael Gerrard, *Refining the Challenge in Implementing Carbon Policy*, 40 ENVTL. L. REP. (ENVTL. LAW INST.) 10,579, at 10,581 (2010).

165. *Id.* at 10,582.

166. CONGRESSIONAL BUDGET OFFICE, POLICY OPTIONS FOR REDUCING CO₂ EMISSIONS xiii (2008), available at <http://www.cbo.gov/ftpdocs/89xx/doc8934/02-12-Carbon.pdf>.

carbon taxes.¹⁶⁷ Utilizing existing structures would simplify implementation and enforcement.¹⁶⁸

The one exception is that AESTFA allows a refund or credit for “qualified offset projects.” The bill does not, however, set forth any requirements related to those projects. In fact, other than defining what a “qualified offset project” is, the only other guidance that AESTFA provides with respect to such projects is that the Secretary must, in consultation with the Secretary of Energy, “conduct a study and submit a report to Congress of qualified offset projects” within one year after AESTFA is enacted.¹⁶⁹ The details of any such program are left to Treasury to determine. Thus, instead of regulatory complexity, AESTFA has so few details as to leave regulators with seemingly unfettered discretion, which is a concern in itself.

The amount of time and resources required to implement greenhouse gas controls under the CAA will be significant, although this will depend heavily on how EPA chooses to implement such a program. Even though there is an existing regulatory system in place for permitting and enforcement, if the existing PSD program were to come into force for greenhouse gases without the Tailoring Rule taking effect, tens of thousands of additional sources would be subject to regulation by EPA and the states. Attempting to create BACT for such a large number of sources could be a significant resource drain, would be extremely time intensive, would greatly burden state agencies, and may not be effective at reducing emissions.¹⁷⁰ Many states have noted that even with the Tailoring Rule, application of PSD requirements to sources that emit more than 75,000 tons of greenhouse gases per year will require a significant investment of time and resources.¹⁷¹

Overall, none of the greenhouse gas control options present a simple approach. Waxman-Markey and Kerry-Lieberman will require a herculean effort by all of the federal and state agencies involved in implementing and overseeing the program, which will likely translate into significant time delays. In an era of extreme budget deficits and a widely embraced desire to reduce federal spending, it is unclear whether the political will

167. *Id.*; see also Carbon Tax Center, Introduction, <http://www.carbontax.org/introduction> (last visited Oct. 31, 2010).

168. Roberta F. Mann, *The Case for the Carbon Tax: How to Overcome Politics and Find Our Green Destiny*, 39 ENVTL. L. REP. (ENVTL. LAW INST.) 10,118, at 10,120 (2009).

169. AESTFA, *supra* note 88, § 4692(b).

170. There are, however, tools that may cushion or avoid some of these concerns. EPA could put limits on, or issue new interpretations of, sources’ “potential to emit” or streamline the permitting of traditionally minor sources by issuing general permits. EPA, *supra* note 112.

171. See EPA, State and Local Permitting Authority Responses to Tailoring Rule Request (60-day Letters), <http://www.epa.gov/NSR/2010letters.html> (last visited Oct. 5, 2010).

exists to undertake such a substantial governmental effort. Even if the costs of the programs are funded by proceeds from the auction of emission credits, creation of what can be seen as a large bureaucracy to implement these programs comes at a time when the public is increasingly unwilling to subsidize government programs. Ironically, the long-heralded “market mechanism” of cap-and-trade may itself be too weighty a regulatory program to take flight in this political atmosphere. At the same time, more streamlined approaches like a carbon tax face tremendous political hurdles because of opposition to taxes, and will not bring the lower costs to regulated entities promised by the investment in regulatory complexity. And relying on traditional CAA authority brings the potential for significant complexity, litigation delay, and higher costs to the regulated community as well.

B. Number and Variety of Sources

While there is no simple relationship between enforcement and the number and variety of sources regulated, experience with previous cap-and-trade programs suggests that subjecting increased numbers and types of sources to regulation will impede enforcement. Taking this into account, it appears that, among the various options, Waxman-Markey, Kerry-Lieberman, and traditional CAA regulation will face the most significant enforcement challenges. In contrast, Cantwell-Collins and the carbon tax proposals will likely face less enforcement challenges since they cover not only a smaller number, but also a smaller variety of sources.

The number and variety of sources regulated under the various greenhouse gas control programs will affect how effectively these programs can be enforced. In general, the costs and complexity of administering a greenhouse gas control program increase as the number and variety of regulated sources increase.¹⁷² This in turn may increase the potential for non-compliance. It should be noted, however, that in certain circumstances an increased number and variety of sources may facilitate compliance among regulated entities. For example, adding

172. *See generally* CONG. BUDGET OFFICE, AN EVALUATION OF CAP-AND-TRADE PROGRAMS FOR REDUCING U.S. CARBON EMISSIONS viii–ix (2001), available at <http://www.cbo.gov/ftpdocs/28xx/doc2876/CapTrade.pdf> (analyzing four proposed plans based on their ease of implementation, carbon-target certainty, incremental-cost certainty, cost effectiveness, and distributional effects).

more sources that are authorized to trade in a greenhouse gas market will likely increase flexibility, allow lower-cost sources to trade, and generally decrease the overall cost of greenhouse gas emission credits. Expanding the pool of regulated entities also allows industries to share the regulatory burden, as some industries will experience technological breakthroughs earlier than others. By helping to create a lower cost to comply, this may ease the enforcement burden on agencies and regulated entities, resulting in greater environmental effectiveness.

Experience with previous cap-and-trade programs nevertheless suggests that—overall—a larger number and variety of sources can impede enforcement. Indeed, the Regional Clean Air Incentives Market (“RECLAIM”) program illustrates this. RECLAIM is a regional cap-and-trade program that was adopted by the South Coast Air Quality Management District in 1993 in order to reduce SO_x and NO_x emissions from certain stationary sources in the South Coast Air Basin.¹⁷³ The sources regulated under RECLAIM are “more heterogeneous than those of the Acid Rain Program, including not only power plants, but also refineries, asphalt, and cement producers.”¹⁷⁴ As noted by McAllister, the heterogeneity of sources regulated under RECLAIM has led to some difficulty in tracking emissions. In fact, “[b]ecause RECLAIM included many different types and sizes of industries, the data required to be submitted by [regulated entities] varied widely. Efforts to automate data submission and verification were hindered by the lack of uniformity.”¹⁷⁵ The heterogeneity of sources has therefore resulted in some enforcement issues.

Experience under the Acid Rain Program also suggests that large numbers and variety of sources will impede enforcement. EPA’s experience with the program suggests that it takes a deep understanding of the regulated sources, large investments of time and staff to work with regulated sources, and detailed explanations of the program requirements to achieve high levels of compliance:

The high levels of data quality and source compliance were not attained from the outset of the programs. Rather, they were achieved through several years of careful program implementation, working closely and cooperatively with the regulated community. The authors believe that in order for a cap-and-trade program to succeed, it is essential that the monitoring, reporting, and verification [MRV] quality

173. EPA, EPA’S EVALUATION OF THE RECLAIM PROGRAM IN THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT, *available at* <http://www.epa.gov/region9/air/reclaim/index.html>. *See also Beyond Playing Banker*, *supra* note 14, at 287–88.

174. *Beyond Playing Banker*, *supra* note 14, at 288.

175. *Id.* at 298, 301.

assurance/quality control elements of the program be based on principles that foster the development and maintenance of a strong program.¹⁷⁶

Based on this, it seems that increasing the number and variety of sources in a cap-and-trade program will make it more difficult to enforce the program.¹⁷⁷

Taking into account the number and variety of sources regulated under the various greenhouse gas control options, it is likely that enforcement will be simpler under certain of the options than others. It is estimated that about 7,500 entities will be regulated under Waxman-Markey and Kerry-Lieberman.¹⁷⁸ Such sources include a variety of upstream and downstream sources of greenhouse gases, including electricity sources, greenhouse gas importers, and various types of stationary sources.¹⁷⁹ In contrast to Waxman-Markey and Kerry-Lieberman, Cantwell-Collins and the carbon tax proposals would regulate only upstream sources of greenhouse gases. This would reduce the number of regulated entities from 7,500 to approximately 2,000 sources, which is comparable to the number of entities that are currently regulated under the Acid Rain Program.¹⁸⁰ In addition, the entities that would be regulated under an upstream approach are more homogeneous than those that would be regulated under Waxman-Markey and Kerry-Lieberman. It is therefore likely that enforcement, including the ability to determine compliance, would be much more straightforward under Cantwell-Collins and the carbon tax proposals.

176. *Fundamentals*, *supra* note 8, at 1577.

177. Even if the number and variety of sources can be managed by regulators, it will take a significant and long-term commitment of resources from all levels of government to achieve the same degree of attention, and therefore levels of compliance, from the regulated community as under the Acid Rain Program. It remains to be seen, however, whether Congress, future administrations, and the states will be willing to provide implementing agencies with the necessary resources to meet the program's needs. This poses a significant risk to the effective implementation and enforcement of the program. *See generally id.* (discussing the EPA's implementation of the Acid Rain Program and NO_x Budget Trading Programs using several fundamental monitoring, reporting, and verification elements).

178. SUMMARY OF THE AMERICAN POWER ACT 5 (2010), *available at* [http://kerry.senate.gov/imo/media/doc/APA Short Summary 1.pdf](http://kerry.senate.gov/imo/media/doc/APA%20Short%20Summary%201.pdf); *see also* MARK HOLT ET AL., GREENHOUSE GAS LEGISLATION: SUMMARY AND ANALYSIS OF H.R. 2454 AS PASSED BY THE HOUSE OF REPRESENTATIVES 84 (Congressional Research Service 2009).

179. *Waxman-Markey*, *supra* note 31, § 700(13); *Kerry-Lieberman*, *supra* note 32, § 700(12).

180. *See* EPA, CLEAN AIR MARKETS: ACID RAIN PROGRAM (2010), <http://www.epa.gov/airmarkt/progsregs/arp/basic.html>.

It is difficult to predict the number of sources that might be regulated under traditional CAA authority. A CAA Section 111 trading program would likely result in roughly the same number and variety of sources as under Waxman-Markey and Kerry-Lieberman. As such, it would likely need significant resources to be administered effectively. Imposition of the PSD program in its current form—without the narrowing effect of the Tailoring Rule—could result in tens of thousands of sources being regulated under the program. This could pose significant administrative, enforcement and compliance difficulties for EPA, the states and the regulated community.

Taken together, the relationship between the number and variety of sources and enforcement is not straightforward. Although adding sources to a cap-and-trade program may increase flexibility and ultimately improve compliance, experience with RECLAIM and the Acid Rain Program suggests that implementing Waxman-Markey, Kerry-Lieberman or any of the traditional CAA approaches will take a significant, long-term investment of resources and political will to have a chance at success. The charm of Cantwell-Collins and the carbon tax proposals is their more narrow focus, but they come at a higher cost to the regulated community.

C. Monitoring, Reporting and Verification

The various greenhouse gas control options take different approaches to monitoring, reporting and verification. Waxman-Markey, Kerry-Lieberman, and the traditional CAA programs all have detailed monitoring, reporting, and verification requirements that will likely support their successful implementation. In contrast, Cantwell-Collins and the carbon tax proposals fail to specify any of these requirements. This gives rise to some significant concerns about whether these programs' ultimate monitoring, reporting, and verification requirements will be sufficient.

Monitoring, reporting and verification are key components of an effective enforcement system.¹⁸¹ Without these components, regulated entities would have little incentive to comply with emission targets, making it unlikely that environmental objectives would be met. These components also facilitate transparency, citizen confidence and citizen enforcement, while building trust in the veracity of the program. Indeed,

181. See, e.g., JAY SHIMSHACK, MONITORING, ENFORCEMENT AND ENVIRONMENTAL COMPLIANCE: UNDERSTANDING SPECIFIC AND GENERAL DETERRENCE (2007) available at <http://www.epa.gov/compliance/resources/reports/compliance/research/meec-whitepaper.pdf> [hereinafter *Understanding Deterrence*]; *Fundamentals*, supra note 8, at 1578 (“Key components of a strong enforcement program include record keeping, reporting, and penalties.”).

as demonstrated by the Toxics Release Inventory (“TRI”), making information on environmental releases publicly available can effectively encourage emissions reductions independently of regulation.¹⁸² This occurs not only through increased community pressure, but also through increased awareness within the source’s management about emissions.¹⁸³ The degree to which the TRI experience can be replicated with greenhouse gases remains to be seen, however, given that greenhouse gases pose a global, not local, risk and may not attract the same level of scrutiny as traditional pollutants.

As can be seen from Table 2, both Waxman-Markey and Kerry-Lieberman take a similar approach to monitoring, reporting and verification of greenhouse gas emissions. Under this approach, EPA must issue regulations that require regulated entities to submit data to EPA “sufficient to ensure compliance with or implementation of the requirements” of the bill.¹⁸⁴ This includes data on greenhouse gas emissions; the production and importation of fuels and gases that may result in greenhouse gas emissions; and the capture and sequestration of greenhouse gases.¹⁸⁵ These data must be based on a continuous monitoring system, such as CEMS, or on an alternative system or methodology that is shown to provide data with the same precision and reliability as a continuous monitoring system.¹⁸⁶

182. See generally LINDA K. BREGGIN AND READ D. PORTER, *APPLICABILITY OF THE TOXICS RELEASE INVENTORY TO NANOMATERIALS* 4 (2008) (finding general, but not unanimous, agreement that TRI has been a success).

183. See Archon Fung & Dara O’Rourke, *Reinventing Environmental Regulation from the Grassroots Up: Explaining and Expanding the Success of the Toxics Release Inventory*, 25 ENVTL. MGMT. 115 (2000).

184. *Waxman-Markey*, *supra* note 31, § 700(b)(1)(B); *Kerry-Lieberman*, *supra* note 32, § 700(b)(1)(B).

185. *Waxman-Markey*, *supra* note 31, § 700(b)(1)(A); *Kerry-Lieberman*, *supra* note 32, § 700(b)(1)(A).

186. *Waxman-Markey*, *supra* note 31, § 700(b)(1)(G); *Kerry-Lieberman*, *supra* note 32, § 700(b)(1)(G).

TABLE 2. COMPARISON OF DATA MONITORING, REPORTING AND VERIFICATION REQUIREMENTS

PROGRAM	SOURCES REGULATED	DATA GENERATED	OVERSIGHT AGENCY	DATA PUBLICLY AVAILABLE	CERTIFIED OR VERIFIED
Waxman-Markey & Kerry-Lieberman	7,500 major GHG sources	Emissions Monitoring	EPA	Yes (internet)	Certified
		Emission Trading	EPA, CTFC, & FERC*	Yes (internet)	Certified
		Title V permitting	States	Yes (files)	Certified
		Regular offsets	EPA	Partially (files)**	Certified & Verified
		Domestic ag & forest offsets	USDA	No**	Certified & Verified
Cantwell-Collins	2,000 fossil fuel sellers	Carbon Monitoring	Treasury	Unknown	Unknown
		Carbon Trading	Treasury	Partially (internet)	Unknown
		Offsets	Treasury	Unknown	Unknown
Carbon Tax	2,000 fossil fuel sellers	Carbon Use	Treasury	Unknown	Unknown
		Tax payments	Treasury	No	Certified
		Offsets	Treasury	Unknown	Unknown
CAA NSPS or PSD programs	Tens of thousands economy wide	Emissions Monitoring	States	Yes (files)	Certified
		Title V permitting	States	Yes (files)	Certified
CAA NSPS cap-and-trade based on model rule reporting requirements***	10,000 major GHG sources	Emissions Monitoring	EPA	Yes (internet)	Certified
		Emissions Trading	EPA	Yes (internet?)	Certified
		Title V permitting	States	Yes (files)	Certified

* FERC applies for Waxman-Markey only.

** No domestic offset verification reports are available to the public under Kerry-Lieberman. Agriculture and forestry offset verification reports are unavailable to the public under Waxman-Markey.

*** A theoretical CAA Section 111 cap-and-trade system created by EPA using its final rule for Mandatory Reporting of Greenhouse Gases as a model of the monitoring, reporting and verification requirements.

Although it is unclear how EPA will implement these requirements, EPA has published its final rule for Mandatory Reporting of Greenhouse Gases.¹⁸⁷ The rule establishes mandatory greenhouse gas reporting requirements for approximately thirty sources of greenhouse gases, including owners and operators of facilities that directly emit greenhouse gases and certain suppliers of fossil fuels and greenhouse gases.¹⁸⁸ EPA anticipates that the rule will apply to about 10,000 facilities that are responsible for approximately 85% of the total U.S. greenhouse gas emissions.¹⁸⁹ While this rule was developed independently of Waxman-Markey and Kerry-Lieberman, it provides a good indication of the sort of regulations that EPA would likely promulgate under a national cap-and-trade program. This rule suggests that entities that are already required to collect and report data using CEMS under a separate program will be required to directly measure their emissions. Other entities will have a choice of using either CEMS or facility-specific greenhouse gas calculations set forth in the rule. Calculations used to estimate missing emissions data also vary by source.¹⁹⁰ Although this approach is similar to the approach taken under the Acid Rain Program, it is important to keep in mind that the number and variety of sources regulated under Waxman-Markey and Kerry-Lieberman will be almost four times greater than under the Acid Rain Program. As discussed above, this is likely to make enforcement more complicated.

Unlike Waxman-Markey and Kerry-Lieberman, Cantwell-Collins does not explicitly set out any monitoring, reporting, or verification requirements for greenhouse gas emissions. Under the bill, the Secretary is required to establish a program within the Treasury to reduce greenhouse gas

187. Mandatory Reporting of Greenhouse Gases; Final Rule, 74 Fed. Reg. 56,260 (proposed Oct. 30, 2009) (to be codified at 40 CFR Parts 86, 87, 89, 90, 94, 98, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1065).

188. *Id.* at 56,377.

189. Press Release, EPA, EPA Finalizes the Nation's First Greenhouse Gas Reporting System/Monitoring to Begin in 2010 (Sept. 22, 2009) *available at* <http://yosemite.epa.gov/opa/admpress.nsf/d985312f6895893b852574ac005f1e40/194e412153fcfea8525763900530d75!OpenDocument>.

190. 74 Fed. Reg. 56,260, at 56,280. Under the rule, reporting entities are required to submit annual reports to EPA that include, among other things, the entities' annual greenhouse gas emissions as well as a certification from a designated representative affirming that the statements and information included in the report are true, accurate and complete. *Id.* The rule requires self-certification with EPA emissions verification. *Id.* at 56,282. Data submitted under the rule will be made available to the public. *Id.* at 56,359.

emissions.¹⁹¹ This program would presumably contain monitoring, reporting, and verification requirements. It is important to note nonetheless that, even after monitoring, reporting, and verification requirements are put in place, Treasury is likely to still need some time, particularly in the initial stages of the program, to gain experience with administering a cap-and-trade program.

Nevertheless, monitoring, reporting, and verification are likely to be less complicated under Cantwell-Collins than under Waxman-Markey and Kerry-Lieberman: not only are there fewer entities to regulate, but the 2,000 entities that are to be regulated already monitor and report fossil fuel sales to the government “for tax and other purposes.”¹⁹² Annual reporting requirements are therefore unlikely to impose significant additional administrative burden. As a result, after Treasury gains experience in administering the program, monitoring, reporting and verification are likely to be more straightforward.

At the same time, it should be noted that it is unlikely Treasury will require the same kind of monitoring, reporting, or verification traditionally set forth in environmental regulations. This is due in large part to the nature of the Cantwell-Collins trading program, which trades on tons of fossil carbon, not greenhouse gas emissions or CO₂ equivalence. The regulations promulgated under Cantwell-Collins will likely use sales data and carbon-content factors to calculate the amount of carbon shares that a first seller needs to comply. Thus, while the other bills’ reporting requirements would create an inventory of greenhouse gas emissions, Cantwell-Collins could create a national map of carbon input into the economy.¹⁹³

The carbon tax proposals do not set forth a separate enforcement scheme, including monitoring, reporting and verification requirements, and would presumably rely on the enforcement mechanisms of the U.S. federal income tax system. To a large extent, this system depends on “voluntarily compliance,” whereby taxpayers are required to independently assess and report their tax obligations to the IRS.¹⁹⁴ The Code provides a number of “incentives” for taxpayers to comply, most of which involve punishing noncompliance.¹⁹⁵ The IRS also depends on the threat of audit

191. *Cantwell-Collins*, *supra* note 33, § 4(a)(1).

192. *Meaningful*, *supra* note 72, at 313.

193. As discussed in more detail in the next section, this would not replace the need for a national inventory of greenhouse gas emissions. As also discussed below, it remains unclear if this information would be available to the public.

194. Leandra Lederman, *The Interplay Between Norms and Enforcement in Tax Compliance*, 64 OHIO ST. L.J. 1453, 1455 (2003) [hereinafter *Interplay*]. Lederman points out that, “for many taxpayers, compliance is not truly voluntary.” *Id.* at 1455 n.6.

195. *Id.* at 1456.

to encourage compliance.¹⁹⁶ Relying on these enforcement mechanisms has the benefit of using established regulatory roles and familiar tools. Fairly minimal monitoring, reporting and verification requirements would be needed to implement a carbon tax, and would seemingly not need to be any more complicated than for other excise taxes.¹⁹⁷ And, like the Cantwell-Collins program, the information gathered from a carbon tax would provide information on the flow of carbon into the economy if made publicly available.

EPA's CAA regulations have a highly developed set of enforcement provisions that rely on extensive monitoring, reporting, recordkeeping, and inspections. Promulgating monitoring, reporting and verification requirements for greenhouse gases under the NSPS and PSD programs would, like a carbon tax, likely follow existing requirements using existing agencies. Although these provisions are largely settled and well understood, they are likely to be time consuming and expensive to implement for greenhouse gases. Like Waxman-Markey and Kerry-Lieberman, the greenhouse gas emissions data collected under any CAA program would be important in confirming compliance with regulatory requirements. These data would also likely complement and expand upon data collected in EPA's existing greenhouse gas inventory.

Perhaps the biggest concern regarding monitoring, reporting, and verification is the failure of Cantwell-Collins and the carbon tax bills to authorize the creation of a national greenhouse gas inventory. EPA's Mandatory Reporting of Greenhouse Gases Rule fills this gap currently, but EPA's authority to assemble this inventory has been called into question. EPA has based its authority to require greenhouse gas reporting on CAA Section 114 for stationary sources and CAA Section 208 for mobile sources.¹⁹⁸ These provisions generally allow EPA to require such reporting, recordkeeping, and monitoring as is "reasonably required" to

196. *Id.*; see also Dennis J. Ventry, Jr., *Whistleblowers and Qui Tam For Tax*, 61 TAXLAW 357, 377 (Winter 2008) [hereinafter *Whistleblowers*]. This threat has somewhat abated over the last several years. *Id.* In fact, between FY 2005 and FY 2009, the number of corporate tax returns that the IRS audited declined dramatically: in FY 2005, 43% of corporations with assets of \$250 million or more were audited; by 2009, this number had dropped to 25%. See TRAC IRS, *Despite Rising Deficits, IRS Audits of the Largest and Richest Corporations Decline*, available at http://trac.syr.edu/tracirs/new_findings/v15 (last visited Jun. 24, 2010). In that time, the IRS also cut back on the number of hours it spent auditing these corporations by one third. *Id.*

197. See, e.g., 26 U.S.C. § 4083 (authority for Treasury to inspect gasoline tax records).

198. 74 Fed. Reg. 56,260, 56,286–87 (Oct. 30, 2009).

help the agency develop standards under the CAA, implement the CAA, as well as to determine compliance with the CAA.¹⁹⁹ Although EPA almost certainly has authority to compile the inventory at present, if regulation of greenhouse gases proceeds under other legislation, EPA may lose this authority, as it arguably will no longer be collecting such information to develop CAA standards or monitor compliance. At the same time, some Members of Congress have introduced bills that would strip EPA of its authority to regulate greenhouse gases under the CAA or otherwise delay EPA's work on greenhouse gases, which could also disrupt assembly and maintenance of the inventory.²⁰⁰ Given the importance of clear, comprehensive information on greenhouse gas emissions, it may be advisable to codify EPA's authority to continue this vital work.

Although monitoring, reporting, and verification requirements are essential to an effective enforcement system, not all of the greenhouse gas control options adequately address these requirements. Indeed, while Waxman-Markey, Kerry-Lieberman and the traditional CAA programs all set out extensive requirements for monitoring, reporting and verifying emissions, Cantwell-Collins and the carbon tax proposals fail to set forth any such requirements. Even more problematic is the failure of Cantwell-Collins and the carbon tax proposals to establish a national greenhouse gas inventory, which—in light of the various challenges to EPA's authority to compile such an inventory—may lead to insufficient information about greenhouse gas emissions in the United States.

D. Transparency

The manner in which the various greenhouse gas control options approach transparency varies not only among the programs, but also within the programs themselves. For example, while Waxman-Markey and Kerry-Lieberman include provisions that ensure that greenhouse gas emissions data are available to the public, they fail to treat the data related to offsets in the same manner. Cantwell-Collins and the carbon tax proposals fail to set out sufficient guidelines for disseminating data. And, while the CAA includes provisions to make emissions data available to the public, much of the data sits in state files that are not readily accessible. These programs may not, therefore, be sufficiently transparent.

In many respects, transparency of greenhouse gas emissions data is the cornerstone of any greenhouse gas control program. Making emissions

199. 42 U.S.C. §§ 7414(a)(1), 7542(a) (2006).

200. *See generally* S.J.Res. 26, 111th Cong. (2010); S. 3072, 111th Cong. (2010).

data publicly available allows the public to access and analyze the data.²⁰¹ In doing so, a regulatory agency “enlists the public in the oversight of the program and enhances the public’s acceptance of the program.”²⁰² Experience with other tradable permit programs has shown that transparency of emissions data enhances enforcement: “[q]uality assurance is easier if data are widely available; veracity-checking is facilitated by the availability of multiple sources of information; and the involvement of private monitors is frequently heavily dependent upon the existence of a rich database.”²⁰³ Indeed, the public availability of data in the Acid Rain Program, including data on emissions, compliance and allowances, has “help[ed] to create a transparent and self-enforcing compliance system. . . .”²⁰⁴ This has contributed to the “high compliance records” in the program.²⁰⁵ For these reasons, transparency is likely to play an important role in the success of any greenhouse gas control program.

Waxman-Markey and Kerry-Lieberman take a similar approach to the dissemination of emissions data. Under these bills, EPA is required to publicly disseminate data submitted by regulated entities “as soon as practicable” after EPA audits such data.²⁰⁶ There are some data, such as confidential business information (“CBI”), that are exempt from dissemination. Although Waxman-Markey and Kerry-Lieberman make clear that data related to greenhouse gas emissions will not be considered CBI,²⁰⁷ data available under these programs may not be as transparent as under the Acid Rain Program. The EPA’s final rule for Mandatory Reporting of Greenhouse Gases suggests that only those entities that are already required to collect and report data using CEMS under a separate program will be required to directly measure their emissions. Other entities will be given a choice of using CEMS or facility-specific calculations. Although it is likely that most of the data used for these

201. *Fundamentals*, *supra* note 8, at 1582.

202. *Id.*

203. Tom Tietenberg, *The Tradable-Permits Approach to Protecting the Commons: Lessons For Climate Change*, 19 OXFORD REV. ECON. POL’Y 400, 415 (2003) [hereinafter *Tradable-Permits Approach*].

204. *Id.*

205. *Id.* at 416.

206. *Waxman-Markey*, *supra* note 31, § 713(b)(1)(N); *Kerry-Lieberman*, *supra* note 32, § 713(b)(1)(N).

207. *Waxman-Markey*, *supra* note 31, § 713(b)(1)(N); *Kerry-Lieberman*, *supra* note 32, § 713(b)(1)(N).

calculations will be made available to the public, some of these data may be claimed as CBI by reporting entities.

EPA's recently proposed CBI regulations for the Mandatory Reporting of Greenhouse Gases Rule provide some insight in what information will likely be available to the public. Although EPA generally determines what constitutes CBI on a case-by-case basis, it has indicated that, due to the number of reporting entities and the amount of data to be submitted by those entities, this practice would likely lead to significant delays in making greenhouse gas emissions data available to the public.²⁰⁸ Under the proposed regulations, "emissions data," which are actual or estimated emissions, inputs to emissions equations, and calculation methodologies, would be publicly available, along with certain test and calibration methods.²⁰⁹ Although it is unclear whether the final rule will retain this level of transparency, legislators may want to follow EPA's lead by adopting similar language into pending bills.

In contrast to emissions data, Waxman-Markey and Kerry-Lieberman limit the dissemination of data related to offset projects. For all offset projects, Waxman-Markey and Kerry-Lieberman require an offset project developer to submit verification reports, prepared by accredited third-party verifiers, which set forth information necessary to determine the quantity of greenhouse gas reductions. This information includes the quantity of greenhouse gases reduced, avoided, or sequestered and the methodologies used for the project.²¹⁰ Waxman-Markey generally makes these reports available to the public within 90 days after they are received, but does *not* require verification reports for agriculture and forestry offset projects to be made publicly available.²¹¹ Kerry-Lieberman

208. 75 Fed. Reg. 39,094, 39,101-02 (July 7, 2010); *see also* Gabriel Nelson, *Emissions: EPA expansion of GHG reporting program finished for now*, GREENWIRE, June 30, 2010, at para. 12.

209. 75 Fed. Reg. at 39,097.

210. *Waxman-Markey*, *supra* note 31, § 736(a), (b); *Kerry-Lieberman*, *supra* note 32, § 736(a), (b).

211. *Waxman-Markey*, *supra* note 31, § 737(a)(1). Reticence to make public information about environmental regulation of agriculture is not new. At the state level, there has been some legal wrangling over the public availability of information relating to farms and agriculture. For example, Maryland's Water Quality Improvement Act (the "WQIA") was enacted in 1998 in order to "address [] the health and environmental concerns caused by agricultural runoff." MD. CODE ANN., AGRIC. §§ 8-801-807; *see also* Paul L. Sorisio, *Poultry, Waste, and Pollution: The Lack of Enforcement of Maryland's Water Quality Improvement Act*, 62 MD. L. REV. 1054, 1056 (2003). The "backbone" of the WQIA is the requirement that all farms implement a nutrient management plan ("NMP"), which sets forth a plan to manage animal waste, fertilizer, sludge and other plant nutrients on a farm. *See* MD. CODE ANN., AGRIC. § 8-801(c). Although farms are required to file summaries of their NMPs with the Maryland Department of Agriculture (the "MDA"), these summaries are to be maintained for three years "in a manner that protects the identity of the individual for whom the [NMP] was prepared." MD. CODE ANN., AGRIC. § 8.801.1(b).

further limits the availability of verification reports: while it requires verification reports related to international offset projects be made public within ninety days of receipt, it does not require *any* verification reports related to domestic offset projects be made publicly available.²¹² Both Waxman-Markey and Kerry-Lieberman therefore limit the transparency of the offsets programs, making it difficult for the public to be involved in oversight of the programs.

There appears to be little reason to keep offset verification reports confidential. To the contrary, offsets are a publicly-created good: those that obtain an offset are being paid from a government-created market to voluntarily undertake actions to improve the environment. This is not an instance of intrusive government regulation or excessive disclosure, but of voluntary actions on which the public is relying to reduce an imminent and substantial threat to human health and the environment. Requiring public disclosure of the underlying data is an important aspect of this. And, case-specific or category-specific CBI claims for certain kinds of data could still be made, instead of declaring all domestic offsets off limits as Kerry-Lieberman does.

It nonetheless seems that Waxman-Markey and Kerry-Lieberman trade, to varying degrees, the public availability of offset reports for third-party verification. While third-party verification can help ensure the reliability of the offsets and their additionality, it is no replacement for transparency. Many questions have already been raised about the reliability and additionality of offsets created under the Kyoto Protocol's Clean Development Mechanism ("CDM"). Allowing U.S. offsets to be verified by third parties, but not vetted by the public, does not help to dispel market distrust of these instruments. Reliance on third-party verifiers may also be highly questionable given recent experience with

Representatives of the farming industry have asserted that these provisions are essential to protecting a farm's competitiveness. Indeed, after a coalition of environmental groups sought disclosure of certain NMP summaries in an action filed against the MDA in 2008, one farming industry representative called NMPs "critical business planning documents," the release of which would "impact [a farm's] competitiveness." Maryland Farm Bureau, *Maryland Farm Bureau Seeks Court Protection for Family Farmers*, 6 SPOTLIGHT 1, 1 (Aug. 2008), quoting the President of the Maryland Farm Bureau. Another industry representative further asserted that the release of NMP information would lead to third-party enforcement suits that would only "prove [farms] are doing what the state already enforces." *Id.* at 8. These same industry interests may have motivated the drafters of Waxman-Markey to omit any requirement that agriculture offset projects make their verification reports publicly available.

212. *Kerry-Lieberman*, *supra* note 32, § 758(b).

the CDM. A review conducted for World Wildlife Fund found that third party verification reports were initially accepted only 36% of the time, with 57% of the verification reports requiring corrections.²¹³ Further, it gave the highest-ranking verifier a grade of D on a scale of A to F, with most verifiers earning Es or Fs.²¹⁴ One cannot help but draw an analogy with credit rating agencies, whose verification of the credit worthiness of many financial instruments later turned out to be unreliable. Reliance on third-party verification without significant oversight and auditing poses a significant threat to confidence in the overall market and, therefore, to the ability of the programs to meet their environmental objectives.²¹⁵

For the other greenhouse gas control programs, it is not yet clear how transparent these programs will be. To start, none of the provisions in Cantwell-Collins address the public dissemination of emissions or offsets data. As with other aspects of the program, this has presumably been left to the Secretary to determine through the promulgation of regulations. Given the large degree of discretion afforded the Secretary, it is not clear Treasury would require the same degree of transparency traditionally provided by environmental regulators. This can result in significantly less information being available to the public.

A carbon tax would present perhaps the most significant hurdle for transparency of emissions and offsets data. Under the Code, the IRS is prohibited from disclosing any information included in a tax return, except in certain limited circumstances.²¹⁶ Thus, unless the legislation were written to require disclosure, which the existing bills do not require, the taxes paid and the underlying carbon use data would not be publicly available.²¹⁷ This lack of transparency may impact not only the public understanding of greenhouse gas controls, but also the effectiveness of the tax itself. If regulated entities subject to the tax are unable to verify their competitors' compliance with the tax, or believe that there is widespread non-compliance, then they will be less likely to comply themselves.²¹⁸

213. Lambert Schneider & Lennart Mohr, *Oko-Institute, V., 2010 Rating of Designated Operational Entities Accredited under the Clean Development Mechanism* (June 28, 2010), <http://www.oeko.de/oekodoc/1023/2010-079-en.pdf>.

214. *Id.*

215. *Fundamentals*, *supra* note 8, at 1582 (“Publicly available, high-quality data are essential for allowance market pricing to work efficiently and for achieving emission reductions at the lowest possible cost.”).

216. *See* 26 U.S.C. § 6103 (2010); *see also Whistleblowers*, *supra* note 196, at 372. For example, the IRS may identify those who are subject to certain excise taxes, and tax information may be disclosed in certain judicial and administrative proceedings.

217. SEC reporting might decrease some opacity, but it is unlikely citizens could obtain a clear view of company-level contributions to the carbon tax.

218. *Understanding Deterrence*, *supra* note 181, at 14–17.

EPA's traditional CAA programs afford greater transparency of data. Almost all facility-specific records are available for inspection from EPA and state offices. While at first blush this sounds quite transparent, there are many hurdles that need to be crossed to actually receive these records. These include the inability to access records other than through in-person review; costs charged by agencies for reproduction; time delays in gaining access to records; and CBI claims. In comparison to the cap-and-trade data that may be made available on the internet, the traditional CAA authorities may provide less transparency in regards to emissions data. Further, to the extent that greenhouse gas controls are put in place using CAA authority, most information would likely be gathered at the state level. In addition to posing high hurdles for data access, this could make it difficult to gain a national-level picture of greenhouse gas emissions controls, unless EPA were to insist on national reporting.

One final, important aspect of transparency is transparency in the emissions market. In order for there to be effective oversight of such a market, a regulatory agency needs sufficient data about the market, including prices, trades, and trends.²¹⁹ In fact, "[t]he more detailed information an oversight body receives, the better its capacity to detect trading irregularities and inconsistencies," thereby allowing it to identify "suspicious spikes in the market price or trade volume."²²⁰ Each of the proposed cap-and-trade programs provides for public dissemination of information related to the emissions market. For instance, Waxman-Markey requires EPA to implement a system to track emission allowances and offset credits and to make this information available to the public.²²¹ Similarly, Kerry-Lieberman requires EPA to implement an allowance tracking system that is to be made publicly available.²²² Kerry-Lieberman also requires any trading organization to provide the public with trading information in real time. This includes bids, settlement prices, and opening and closing ranges for all greenhouse gas instruments traded through the organization.²²³ And, while Cantwell-Collins has a limited emissions market, the bill still requires that, for any trades that occur, all relevant transaction dates, allowance quantities, and prices be "made

219. See *Financial Markets*, *supra* note 21, at 10,062.

220. *Id.*

221. *Waxman-Markey*, *supra* note 31, § 724(d).

222. *Kerry-Lieberman*, *supra* note 32, § 724(c).

223. *Id.* § 2410.

publicly available on a real-time basis.”²²⁴ This degree of transparency should assist in the effective supervision of a greenhouse gas market.

As is clear from the foregoing, the various greenhouse gas options approach transparency differently. While Waxman-Markey and Kerry-Lieberman generally allow emissions data to be made available to the public, they fail to make all information related to their offsets programs available. Traditional CAA authority affords a certain degree of transparency, but there are significant hurdles to cross to gain access to information. Cantwell-Collins and the carbon tax proposals fail to even address the public availability of data. This will likely affect public trust in the program and the ability of the public to fully participate in overseeing them.

E. Role of Citizens

Despite the central role of citizen enforcement in environmental law, it remains unclear whether citizens will be afforded the same role in implementing and enforcing greenhouse gas control options. Part of this stems from the fact that citizen suits may not be necessary for overseeing emissions markets in the cap-and-trade programs since penalties are automatically enforced against violators. Nevertheless, several of the options fail to provide for citizen enforcement or fail to provide data to allow citizen enforcement—or both—even where it would be useful to do so.

Citizens play an important role in enforcing environmental laws. Although federal and state agencies hold the primary responsibility for enforcement, every major environmental law includes “citizen suit” provisions. Citizen suits allow “private citizens to enforce the laws when the government [is] unwilling or unable to do so.”²²⁵ For instance, citizen suits are needed to “make up the balance of necessary enforcement at times when under-funded or over-worked agencies [cannot] ensure that all laws are complied with.”²²⁶ Indeed, “[c]itizen resources are an important adjunct to governmental action to assure that these laws are adequately enforced. In a time of limited [g]overnment resources, enforcement through court action prompted by citizen suits is a valuable

224. *Cantwell-Collins*, *supra* note 33, § 4(b)(7)(A)(ii).

225. Will Reisinger et al., *Environmental Enforcement and the Limits of Cooperative Federalism: Will Courts Allow Citizen Suits to Pick Up the Slack?*, 20 DUKE ENVTL. L. & POL’Y FORUM 1, 2 (Winter 2010) [hereinafter *Limits*].

226. *Id.*

dimension of environmental law.”²²⁷ At the same time, citizen suits are also needed to hold government agencies accountable where, due to political considerations or otherwise, those agencies fail to bring enforcement proceedings.²²⁸ This is particularly important in the context of greenhouse gas programs, which will need to be implemented over a period of 40 years or more in states whose governors and legislators may not support greenhouse gas regulation.

The various greenhouse gas control options take different approaches to the role of citizens. To start, Cantwell-Collins and the carbon tax proposals do not contain any citizen suit provisions and otherwise fail to carve out a role for citizens. Citizen enforcement is therefore unlikely to be available under these two approaches, not only because of a lack of statutory authority, but also—in the case of carbon taxes—a lack of data. This leaves these programs solely in the hands of federal regulators without a ready lever to use in the face of changing political and economic environments over time, which may leave the programs’ effectiveness at risk.

In contrast, Waxman-Markey and Kerry-Lieberman allow citizen suits through existing CAA provisions.²²⁹ While this suggests some role for citizens, these suits may have diminished utility for cap-and-trade programs, and may not even be able to be brought.²³⁰ In regards to utility, this will likely depend on the nature of the violation: citizen suits are likely to be useful for various violations of offset, monitoring, and reporting provisions. They are, however, likely to be less useful for violations of allowable emission limits (i.e., where regulated entities hold too few allowances).²³¹ This is because, like the Acid Rain Program, both bills require penalties for such violations to be assessed automatically. This means that they are due immediately and without

227. James R. May, *Now More Than Ever: Trends in Environmental Citizen Suits at 30*, 10 WIDENER L. REV. 1, 5–6 (2003) (quoting 136 Cong. Rec. S3, 183 (daily ed. Mar. 26, 1990) (remarks of Sen. David Durenberger)).

228. *Id.* at 6.

229. *Waxman-Markey*, *supra* note 31, § 337(d); *Kerry-Lieberman*, *supra* note 32, § 2503(c).

230. *See, e.g., Limits*, *supra* note 225, at 28–57 (citing costs and attorneys’ fees, standing, Eleventh Amendment arguments, and the definition of diligent prosecution as barriers to successful citizen suits).

231. All greenhouse gas provisions under Waxman-Markey and Kerry-Lieberman are “emission standards or limitations” subject to citizen suit provisions. *Waxman-Markey*, *supra* note 31, § 723(b)(3); *Kerry-Lieberman*, *supra* note 32, § 2503(c).

action by the enforcing agency,²³² leaving little room, or apparent need, for citizen involvement. At the same time, a citizen suit might not even be possible for such violations. The CAA only allows such a suit “if there is evidence that the alleged violation has been repeated.”²³³ Query whether a violation would have to occur twice before a citizen could successfully maintain a suit.²³⁴ Moreover, to the extent USDA would have oversight and non-discretionary duties under an offsets program, an action may not be able to be brought against USDA as both bills seem to preclude such an action.²³⁵

Like Waxman-Markey and Kerry-Lieberman, regulation under traditional CAA authorities would allow citizen suits through existing CAA provisions. In contrast to the two bills, citizen enforcement would likely have some utility, particularly under the PSD program. In fact, because programs under the CAA do not allow for immediate and automatic penalties, citizen oversight could be quite useful. Citizen suits could therefore play their traditional role of helping to encourage robust program implementation by state and federal regulators.

It remains to be seen, however, whether significant procedural hurdles to citizen suits will prevent them from being brought under any greenhouse gas control option. The court-created doctrine of standing requires plaintiffs to demonstrate an actual or imminent injury in fact that is concrete and particularized, that is fairly traceable to the acts of the defendant, and that can likely be redressed by a favorable court decision.²³⁶ Although the Supreme Court found standing for Massachusetts to bring a case against EPA to regulate greenhouse gases, it did so based on the “special solicitude” that states enjoy in a standing analysis.²³⁷ Whether a court would find similar standing for private litigants acting to enforce violations of a greenhouse gas program is unclear and will

232. *Waxman-Markey*, *supra* note 31, § 723(b)(3); *Kerry-Lieberman*, *supra* note 32, § 723(b)(3).

233. 42 U.S.C. § 7604(a)(1) (2010). *See* Arnold Reitze, AIR POLLUTION CONTROL LAW: COMPLIANCE & ENFORCEMENT 521, 601 (2001) (CAA amendments partially overruled Gwaltney decision that limited suits for purely past violations).

234. Even if a citizen suit could survive these barriers, there are also some procedural hurdles that must be cleared. Before filing a suit a citizen must give EPA, the state, and the defendant at least sixty days notice. 42 U.S.C. § 7604(b) (2010). And, a citizen may not bring suit if EPA or the state has already brought and is diligently pursuing an enforcement action in court. *Id.* This prohibition does not, however, apply to administrative penalties, and does not foreclose the citizen from intervening in the enforcement action as a matter of right. *Id.*

235. While the bills’ conforming amendments included other agencies, such as USDA, in the definition of “Administrator,” this was not done for CAA Section 304. *See Waxman-Markey*, *supra* note 31, § 337; *Kerry-Lieberman*, *supra* note 32, § 2503.

236. *See, e.g., Limits*, *supra* note 225, at 35.

237. *Massachusetts v. EPA*, 549 U.S. 497, 514 (2007).

depend to some degree on the future direction of the standing doctrine as shaped by the courts.²³⁸

Accordingly, it is likely that citizens will face significant barriers to participate in the oversight of the various greenhouse gas control options. Cantwell-Collins and the carbon tax proposals fail to even carve out a role for citizens, making it unlikely that citizens will be able to participate in oversight of those programs. While the citizen suit provisions of the CAA apply under Waxman-Markey and Kerry-Lieberman, it is not yet clear whether citizen suits would serve any purpose, or even be possible, under either bill given substantive and procedural limitations. It is particularly worrisome that citizen suits related to oversight of the USDA-administered agriculture and forestry offsets program seem to be precluded under the two bills despite the need for enhanced citizen oversight. At the same time, some of the same procedural limitations that may create a barrier to citizen participation under Waxman-Markey and Kerry-Lieberman may also create a barrier under traditional CAA programs.

F. Role of the States

In establishing a role for states, federal greenhouse gas control programs must engage in a careful balancing act: they must balance the need to utilize state expertise and capacity to implement traditional environmental programs against the need for nationwide consistency. Nationwide consistency may be particularly undermined where a state does not support greenhouse gas controls. A review of the various greenhouse gas control options shows that the cap-and-trade programs and carbon tax proposals properly reflect this balancing act by providing

238. See *Limits*, *supra* note 225, at 34–42. The discussion draft of Waxman-Markey did include a citizen suit provision. This provision allowed citizens to bring an action if they suffered, or reasonably expected to suffer, harm attributable to a violation of an emissions standard or limitation, or EPA's failure to perform non-discretionary duty. *Waxman-Markey Discussion Draft*, § 336(a), available at http://energycommerce.house.gov/Press_111/20090331/acesa_discussiondraft.pdf. The term "harm" was defined to include "any effect of air pollution (including climate change), currently occurring or at risk of occurring, and the incremental exacerbation of any such effect or risk that is associated with a small incremental emission of any air pollutant . . . whether or not the effect or risk is widely shared." *Id.* This provision was deleted before the House passed the bill, and the language about harm was put into the bill's findings instead. It remains to be seen whether courts will give any weight to such findings or whether further judicial development of the standing doctrine will preclude citizen suits for climate change harms.

states with a distinct, but diminished, role. Maintaining the states' traditional roles under the CAA authorities may, however, prove problematic.

In most environmental statutes, states are given the primary responsibility for implementing and enforcing federal laws and regulations using the “cooperative federalism” approach.²³⁹ Under this approach, the federal government sets minimum environmental standards and the states have the “primary responsibility” for implementing programs to meet those standards.²⁴⁰ Each state is generally required “to decide which sources to regulate and the extent to which each will be regulated” so that the national standards are met.²⁴¹ States also have the right to impose stricter standards.²⁴² At the same time, the federal government continues to play a role in overseeing the state programs. The federal government is responsible for not only providing initial approval of the programs, but also monitoring the programs for compliance.²⁴³ This system is intended to allow states to tailor their programs to local conditions while ensuring sufficient uniformity among states so that minimum federal standards are met.

State involvement in a cap-and-trade program does, however, pose some risks to the consistency of the national market. For example, while implementing the Acid Rain Program, New York attempted to prohibit the sale of excess acid rain allowances from New York sources in order to create a more stringent program.²⁴⁴ And when EPA created Clean Air Mercury Rule (“CAMR”), less than half the states signed up to engage in the trading program, leaving EPA to implement the program in the other half of the states. At the international level, the European Union's Emission Trading System has been troubled by reports of certain member states overestimating emissions and Hungary selling “used” credits back into the open market.²⁴⁵ At the same time, studies have shown that, in the United States, state penalties assessed against polluters tend to be significantly lower than penalties assessed by the federal

239. See *Limits*, *supra* note 225, at 6.

240. STAFF OF COMMITTEE ON ENERGY AND COMMERCE, *Climate Change Legislation Design White Paper: Appropriate Roles for Different Levels of Government* 8 (2008), http://energycommerce.house.gov/images/stories/Documents/PDF/selected_legislation/white%20paper%20st-lcl%20roles%20final%202-22.pdf [hereinafter *Appropriate Roles for Different Levels of Government*].

241. *Id.*

242. *Id.* at 8–9.

243. *Limits*, *supra* note 225, at 6.

244. The federal courts rejected this effort on the grounds that it was pre-empted by the CAA. See generally *Clean Air Markets Group v. Pataki*, 338 F.3d 82 (2d Cir. 2003).

245. See generally *ClimateWire.com, Hungary Says Trader Bought Used Credits, Shakes Carbon Market*, Mar. 22, 2010.

government.²⁴⁶ In light of the potential bias of state officials toward in-state economic interests and the open opposition of some officials to greenhouse gas regulation, giving significant authority of the trading mechanisms of any greenhouse gas system to states could result in an unsteady market, delay in implementation and uneven environmental results.

Because of the paramount need for national consistency and oversight, virtually any cap-and-trade program will diminish the role of the states to some degree. For example, the Acid Rain Program is “one of the most federally-oriented air pollution control programs” with a highly centralized enforcement system.²⁴⁷ Experience with this program “has shown that, for cap-and-trade programs, centralized program implementation, including data reporting and verification, is efficient and works well.”²⁴⁸ Even in this highly centralized program, however, it is important to recognize that states still play an important role in enforcement. States have the authority, for example, to enforce monitoring requirements.²⁴⁹ And, about 40% of the staff for the Acid Rain Program is state and local agency employees who conduct field audits.²⁵⁰

Both Waxman-Markey and Kerry-Lieberman set out a role for states in enforcing their greenhouse gas control programs that is reminiscent of the Acid Rain Program. Under both bills, states are prohibited from implementing or enforcing a cap-and-trade program.²⁵¹ Certain state actions do not, however, fall within the scope of this prohibition. States can still, for example, adopt standards, limits, regulations or programs to reduce greenhouse gases so long as they are not implemented through the issuance of a limited number of tradable instruments.²⁵² In addition, under both bills, states may be delegated the responsibility for conducting audits of domestic offset projects.²⁵³

246. See, e.g., Mark Atlas, *Enforcement Principles and Enforcement Agencies: Principal-Agent Relationships in a Delegated Environmental Program*, 41 LAW & SOC. REV. 939, 971 (2007).

247. *Appropriate Roles for Different Levels of Government*, *supra* note 240, at 2.

248. *Fundamentals*, *supra* note 8, at 1581.

249. *Appropriate Roles for Different Levels of Government*, *supra* note 240, at 9.

250. *Beyond Playing Banker*, *supra* note 14, at 286.

251. *Waxman-Markey*, *supra* note 31, § 335; *Kerry-Lieberman*, *supra* note 32, § 2501. Waxman-Markey only preempts state cap-and-trade programs from 2012 to 2017.

252. *Waxman-Markey*, *supra* note 31, § 335; *Kerry-Lieberman*, *supra* note 32, § 2501.

253. *Waxman-Markey*, *supra* note 31, § 738(b) (2009); *Kerry-Lieberman*, *supra* note 32, § 739(d)(1) (2009).

For the other greenhouse gas control programs, it is not yet clear what role states will play. Cantwell-Collins and the carbon tax proposals do not set out any provisions related to the role of states, and do not preempt existing state greenhouse gas programs. This could have various outcomes. It could leave states unfettered authority to run their own greenhouse gas trading systems, set their own renewable portfolio standards, and otherwise continue to regulate greenhouse gases on a state and regional basis. But Congress may preempt such state activities or states may deem them duplicative if Cantwell-Collins or a carbon tax is implemented. Alternatively, some combination of these scenarios could play out. What seems clear, however, is that there appears little room for state involvement in a carbon market, and states would have little to no role in implementing and enforcing a federal carbon tax.

Implementation and enforcement of greenhouse gas controls through traditional CAA authorities would rely heavily on the states because the NSPS and PSD programs are implemented at the state level. This is potentially problematic, as opposition to regulation of greenhouse gases under the CAA is pronounced in some states.²⁵⁴ This may require EPA to federally implement these programs in many states during a time of serious federal budget shortfalls and significant opposition to expansion of the role of the federal government.²⁵⁵ At the same time, if EPA were to devise a cap-and-trade program under CAA Section 111, it would be important to maintain centralized EPA control over the market mechanisms, as was done in the Acid Rain Program and the CAMR.

From the foregoing review, it appears that most of the greenhouse gas control options appropriately balance the role of states, involving states in the implementation of the cap-and-trade programs while leaving the national market and national tax provisions largely to federal agencies to implement. The notable exception is the peril of heavy reliance on states if greenhouse gas controls are implemented using traditional CAA authority.

G. Penalties

The various greenhouse gas control options all establish fairly stringent penalties for non-compliance. These penalties range from 100% to 500%

254. See, e.g., Letter from Bryan Shaw, Chairman, Texas Commission on Environmental Quality, and Gregg Abbot, Attorney General of Texas to Lisa Jackson, Administrator, EPA, and Alfred Armendariz, Region VI Administrator, EPA (Aug. 2, 2010) (heavily criticizing EPA regulation of greenhouse gases under the CAA).

255. J. Cohen & D. Balz, *What's So Good About the Government*, WASH. POST, Oct. 10, 2010 at A1 (public evenly split between wanting more services and higher taxes versus fewer services and lower taxes).

and, while these penalties are lower than those under the Acid Rain Program, they appear sufficient to deter non-compliance. It remains unclear, however, whether any of the proposed programs would provide sufficient compliance assistance to help regulated entities understand and comply with the programs' provisions, thereby avoiding the need for penalties in the first place.

The penalty provisions of any greenhouse gas reduction program should ensure that potential violators face sanctions that deter illegal behavior and encourage compliance with the program. This usually involves civil or criminal sanctions that (1) are sufficiently stringent so that compliance is more economically beneficial than non-compliance;²⁵⁶ (2) are swiftly and publicly assessed;²⁵⁷ and (3) are accompanied by sufficient compliance assistance so that regulated sources can understand and comply with requirements in an efficient and timely manner.²⁵⁸

Experience with the Acid Rain Program suggests that, for cap-and-trade programs, penalties that are significantly more expensive than the cost of compliance and that are assessed quickly—even automatically—are likely to be successful. Under the program, if a regulated entity fails to have sufficient emissions credits to meet its compliance obligations, penalties of \$2,000 per ton of emissions (equal to almost seven times the average market price of an emissions credit) are automatically due, and the deficient number of credits from the entity's compliance budget are deducted from the following year.²⁵⁹

The proposed cap-and-trade programs all follow the Acid Rain Program's example of assessing high and swift penalties for non-compliance. Both Waxman-Markey and Kerry-Lieberman assess automatic penalties of twice the going market rate for emissions allowances. In addition, these bills require violators to forfeit allowances from their current or future budgets in order to cover the excess emissions.²⁶⁰ Cantwell-Collins provides even stricter penalties, requiring violators to pay five times the

256. David Hodas, *Enforcement of Environmental Law in a Triangular Federal System: Can Three Not Be a Crowd When Enforcement Authority Is Shared by the United States, the States, and Their Citizens?*, 54 MD. L. REV. 1552, 1690 (1995) ("each action must reliably result in civil penalties that (1) deprive the violator of all economic benefits derived from the violations, and (2) place the violator in a significantly worse position than it would have been if it had complied.").

257. *Reinventing*, *supra* note 183, at 60–61.

258. *Id.* at 67–70.

259. *See, e.g., Fundamentals*, *supra* note 8, at 1578.

260. *Waxman-Markey*, *supra* note 31, § 723; *Kerry-Lieberman*, *supra* note 32, § 723.

market rate for emissions allowances.²⁶¹ The penalty is immediately due and payable to the Secretary.²⁶²

The proposed carbon tax bills do not contain separate penalty provisions and rely on the Code's existing penalty provisions. The Code includes a "variety of civil penalties,"²⁶³ with "over 600 distinct civil tax penalty provisions."²⁶⁴ For example, the IRS has the right, which would presumably apply to carbon tax penalties, to assess a 100% penalty on taxpayers that have willfully failed to collect, truthfully account for, or pay taxes that are due to the federal government.²⁶⁵ In addition, the Code includes criminal sanctions.²⁶⁶ The civil tax code penalties are significantly less than those provided in the cap-and-trade bills. And, unlike the Acid Rain Program, they are not automatically assessed and due, but require detection and assessment by Treasury. This could delay enforcement and give violators the chance to escape detection.

EPA's traditional CAA authorities provide for significant daily penalties for non-compliance, plus assessment of penalties to recoup any economic benefits enjoyed by the violator due to non-compliance.²⁶⁷ Penalties are not automatically due, however, and calculation of the economic benefit requires application of a complex economic model. Like a carbon tax, EPA or states must detect the violation and decide to enforce, neither of which may occur. Further, penalties are usually assessed through settlements that result in payment of less than the maximum fine.²⁶⁸ Assessment of penalties also requires significant resources to bring administrative or judicial actions.

At the same time, although compliance with CAA requirements has not been well studied, there is reason to be concerned about relying on traditional CAA programs. While compliance with the Acid Rain Program appears to be over 99%,²⁶⁹ compliance with the more routine permitting and emission requirements of the NSPS, PSD, NESHAPs and other programs appears to be far less robust. A Council on Environmental

261. *Cantwell-Collins*, *supra* note 33, §4(a)(5) (2009). We do not have sufficient data to comment on whether there would be a material difference between a penalty for 200%, 500%, and 1000% in deterring non-compliance.

262. *Id.* § 4(a)(5)(C).

263. *Id.*

264. Craig A. Max IV, *Hand-Holding, Brow-Beating, and Shaming into Compliance: A Comparative Survey of Enforcement Mechanisms for Tax Compliance*, 40 VAND. J. TRANSNAT'L L. 541, 565, 573 (Mar. 2007) [hereinafter *Hand Holding*].

265. Internal Revenue Code, 26 U.S.C. § 6672 (2010); *see also* United States v. Novelli, 381 F. Supp. 2d 1125, 1132 (C.D. Cal. 2005) (quoting United States v. Jones, 33 F.3d 1137, 1139 (9th Cir. 1999)).

266. *Interplay*, *supra* note 194, at 1456.

267. *Stationary Source*, *supra* note 121, at 272–80.

268. Hodas, *supra* note 256, at 1609.

269. *Fundamentals*, *supra* note 8, at 1576.

Quality study in the 1990s estimated that industrial source compliance with CAA requirements was as low as 35% resulting in emissions being about 10% above regulatory levels.²⁷⁰ Therefore, the traditional CAA penalty authorities are much less nimble, much less certain to be assessed and likely less effective than using a well designed cap-and-trade model.

Although penalties are important, they are not sufficient to assure compliance. Compliance assistance—creating programs that are easily implemented; working with regulated entities to understand their industries and concerns; answering questions and providing guidance—is a crucial element of enforcement. Indeed, EPA staff have credited the success of the Acid Rain Program to extensive collaboration with regulated entities, including provision of compliance assistance—and not to draconian penalties.²⁷¹ From the pending greenhouse gas control options, it is not clear whether sufficient resources would be allocated to the implementing agencies to ensure robust compliance assurance efforts.

Accordingly, the various greenhouse gas control options all appear to impose sufficiently stringent penalties to deter non-compliance. Indeed, all of the cap-and-trade programs assess penalties that are well above the market rate for emission allowances. And, while the carbon tax proposals and traditional CAA authority assess smaller penalties, these penalties are still significant. It is important to note nonetheless that, unlike the cap-and-trade programs, penalties under the carbon tax proposals and traditional CAA authority are not assessed automatically and, as such, may take some time and resources to detect. At the same time, while the various greenhouse gas control programs all appear to have sufficient penalty provisions, it is not yet clear whether any of these programs will have sufficient compliance assistance to help regulated entities meet their compliance obligations.

270. See Clifford Russell, “Monitoring and Enforcement,” in *PUBLIC POLICIES FOR ENVIRONMENTAL PROTECTION* (Paul Portney ed., 1990).

271. *Fundamentals*, *supra* note 8, at 1579–80.

III. CONCLUSION

Given the controversial nature of greenhouse gas controls, the long timeline it will take to implement greenhouse gas control programs, and the potentially very broad reach of these programs across the economy, it will be critical that the chosen control method can be enforced with relative consistency, fairness, ease, and immediacy over the life of the program and throughout the country. Our review of the various greenhouse gas control options shows that there are relative strengths and weaknesses, as well as important tradeoffs to be made in the enforcement provisions of each of the leading candidate programs. In particular:

- Waxman-Markey and Kerry-Lieberman lower implementation costs to the regulated community, but bring tremendous regulatory complexity. While these programs generally contain strong and important monitoring, reporting and verification requirements, they fail to provide for strong and transparent reporting and verification provisions in regards to offsets, particularly forestry and agricultural offsets. While the bills allow for citizen suits, the utility and availability of these suits are limited in a cap-and-trade program, and the bills inexplicably exempt agricultural and forestry offsets from them. The bills necessarily rely on states to assist in implementing the programs, but rightfully place oversight of emissions markets with federal authorities. These programs will take a significant amount of time to implement and promise significant political conflict and an ongoing stream of litigation.
- Cantwell-Collins proposes a far simpler scheme than the leading cap-and-trade proposals, but it would likely also bring higher implementation costs to the regulated community. It fails to create a central inventory of greenhouse gas emissions and forecloses citizen enforcement of its provisions, leaving it sorely lacking in transparency. At the same time, the program places implementation in the hands of Treasury, which has little expertise in administering such programs.
- Carbon tax proposals promise even greater ease of implementation, but will not bring the synergies and lower costs that cap-and-trade models promise. The bills also fail to explain significant program details, and the enforcement efforts may be lacking if they follow existing federal tax procedures. Like Cantwell-Collins, the carbon tax bills fail to create a national inventory of greenhouse gas emissions, lack transparency, and do not allow a role for citizen enforcement.

- Reliance on traditional EPA authority under the CAA faces significant barriers to optimizing program implementation. Although the enforcement provisions are strong and largely transparent with the opportunity for citizen enforcement, this approach relies heavily on states at a time when some state authorities actively oppose greenhouse gas controls, potentially setting up a significant battle between federal and state authorities and potentially undermining program effectiveness.

Our review further suggests that there are some mitigation measures that could be taken to help ensure that a greenhouse gas control programs can be efficiently and successfully implemented to meet its environmental goals. Some of these measures include:

- Congress should explicitly give EPA authority to create a robust greenhouse gas inventory with carefully prescribed CBI provisions that mirror EPA's existing approach.
- Offsets for forestry and agriculture should not be included in the program design if they are regulated by USDA alone. At the same time, these offsets should not be laden with special provisions that obscure their transparency and the additionality of their emissions reductions and should not be exempt from citizen oversight.
- All offset programs should be transparent to the public, with verification reports made readily available to the public.
- Agency expertise should determine agency function in the greenhouse gas control program. Giving USDA or FERC oversight authority of certain program elements may undermine the programs.
- The ability for citizens to participate in the oversight of the greenhouse gas control program should be carefully considered and facilitated in all programs.
- Given the potentially conflicting roles of states, it is likely necessary for the greenhouse gas control program to limit state involvement and increase federal involvement, as compared to the cooperative federalism model used in traditional environmental regulations.

- All greenhouse gas control programs should be accompanied by robust compliance assurance programs to help regulators understand regulated sources and to help regulated sources understand regulatory requirements.

Enforcement is usually considered the last element in environmental programs—it is what regulators turn to when regulated entities fail to abide by the rules. But as this review has shown, enforcement considerations are central in ensuring environmental effectiveness and, as such, should inform the design and policy choices made around federal greenhouse gas control options.