

# The Road Ahead

EPA's Options and Obligations  
For Regulating Greenhouse Gases

Inimai M. Chettiar  
Jason A Schwartz  
Report No. 3  
April 2009

Institute *for* Policy Integrity  
*New York University School of Law*

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Thanks are also due to Edna Ishayik, as well as to Junyeon Park.

# Foreword

There is broad consensus among scientists, economists, and policymakers that climate change is a significant threat that must be addressed.

Most of the scientific community believes that climate change poses significant risks that could impose large welfare costs on future generations. While the costs of reducing greenhouse gases may be high, the risks of doing nothing are much higher.

While climate change will require a global response, it has become clear that the United States must provide leadership in the creation of a successful international regime. Domestic efforts to address climate change are also significant on their own; the United States is the second largest greenhouse gas emitter and is likely to drive the technological changes needed to reduce aggregate global emissions. Developing domestic climate change policy in the United States is therefore a key linchpin necessary to make progress in addressing global greenhouse gas emissions.

In this report, Inimai M. Chettiar and Jason A Schwartz—fellows at the Institute for Policy Integrity—provide an in-depth analysis of a particularly important aspect of domestic greenhouse gas policy: the relationship between the Environmental Protection Agency (EPA) and Congress. The U.S. Supreme Court held two years ago that EPA has the power under the Clean Air Act to regulate greenhouse gases as pollutants. This ruling creates a timeline of obligations that will require the agency to act soon in some manner, though EPA retains a good deal of discretion to choose its regulatory strategy. At the same time, Congress has begun addressing the issue in earnest, and we may see the adoption of economy-wide greenhouse gas legislation in the near future. Avoiding conflicts between regulation under the Clean Air Act and future legislation, while crafting the best policy to begin addressing climate change, is therefore an important priority.

Chettiar and Schwartz look into the labyrinthine structure of the Clean Air Act to identify EPA's obligations under the law and the variety of regulatory options available to the agency. They examine how both required and optional regulatory actions would interact with a legislative cap-and-trade system—the most likely candidate for congressional approval. They also examine how closely EPA could approximate a cap-and-trade system using only the regulatory tools in the Clean Air Act. Importantly, they find that the broad powers given to EPA by the Act allow the agency to construct a very close approximation of an economy-wide cap-and-trade system, with a few small but important caveats. This finding is extremely important because it indicates that congressional deadlock—a very real possibility—need not result in inaction. In fact, because EPA has the power to create a



regulatory cap-and-trade system, it is possible that the United States could join a global regime through an executive agreement, forgoing the difficult treaty ratification process that halted adoption of the Kyoto Protocol.

This report is an important contribution at a critical time. Several environmental law scholars and policy experts have examined the myriad challenges of using the Clean Air Act to address greenhouse gas emissions. *The Road Ahead* synthesizes and expands on this work to provide a map for EPA through this legal minefield. The political and social consequences of missteps on the part of the agency are grave. But it is even more dangerous for the agency to remain paralyzed. With this report, Chettiar and Schwartz have given us reason to hope that we can navigate this perilous ground successfully.

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Michael A. Livermore  
Executive Director

# Executive Summary

What are EPA's obligations under the Clean Air Act, and how far can and should the agency go to regulate greenhouse gases?

With the anticipated finalization by EPA of its “endangerment finding” for greenhouse gases, the agency has triggered action to regulate CO<sub>2</sub> and other heat-trapping gases under the Clean Air Act. With this move, President Obama has created a set of responsibilities and obligations, as well as a range of options and powers to control emissions. The questions now are: What road will he take? Will he be met by success or setbacks?

If EPA pursues traditional “command-and-control” regulation under the Clean Air Act, it may set itself on a collision course with Congress, which has been moving quickly to design “cap-and-trade” legislation. If EPA adopts mandatory control regulation and Congress later enacts a cap-and-trade system, there will be significant and unnecessary transition costs for the American economy. Under the Clean Air Act, however, EPA has a great deal of flexibility to design regulatory programs. It must use that flexibility wisely to avoid a conflict with Congress.

If Congress fails to act, President Obama has the power under the Clean Air Act to adopt a cap-and-trade system that auctions greenhouse gas allowances. President Obama also has the power under the Clean Air Act to implement an executive agreement at the international level, rendering Senate approval of a climate treaty unnecessary. EPA's first priority must be to meet its legal obligations without impeding the work being done in Congress. But if Congress fails to act decisively, then putting those powers to use will be an essential stop-gap to avoid complete inaction on climate change.



# EPA's Obligations

On the basis of the U.S. Supreme Court's decision in *Massachusetts v. EPA*, petitions currently pending before EPA, and EPA's responsibilities to implement the provisions of the Clean Air Act in a reasonable manner, EPA can no longer delay creating new greenhouse gas regulations in many areas.

## Legal Urgency to Act

In April 2007, the Supreme Court issued its landmark ruling in *Massachusetts v. EPA*, thus beginning a series of steps that, barring congressional intervention, will lead ineludibly to regulation of greenhouse gases under the Clean Air Act. The Court made three key holdings that will trigger a mandatory response from EPA: (1) that the definition of "air pollutant" in the Clean Air Act includes greenhouse gases; (2) that any justification not to regulate must "conform to the authorizing statute"; and (3) that "[t]he harms associated with climate change are serious and well recognized." Together, these holdings give EPA very little wiggle room to avoid regulation.

Following through on its obligations under the Supreme Court's ruling, EPA has now made a proposed finding under the Clean Air Act that greenhouse gases pose a danger to public health and welfare. EPA has also found that emissions from motor vehicles contribute to greenhouse gas pollution, setting the stage for motor vehicle regulations in the near term.

Finally, several petitions currently pending before the agency are very similar to the petition that led to the Supreme Court's decision. Given the Court's findings in that case, EPA is constrained in how it can

respond to these petitions—while EPA has some discretion in how it ultimately regulates, it is likely that the petitions will require regulation. Because many of the petitions have been pending for several years, EPA must move quickly to respond within a reasonable timeframe.

## Greenhouse Gas Standards for New Motor Vehicles

The proposed finding that greenhouse gas emissions from motor vehicles are a threat to public health and welfare will ultimately require EPA to establish greenhouse gas emissions standards for new motor vehicles. Because the Supreme Court specifically addressed the issue of greenhouse gases from motor vehicles, EPA must move quickly to adopt regulations, or else it risks future confrontations with the courts.

## Aircraft Engines

Public petitions have already been filed that will require the agency to issue a positive finding that aircraft contribute to greenhouse gas pollution that endangers public health or welfare. Once the positive endangerment finding is made, EPA will be required to issue emissions standards for aircraft engines.

## Marine Vessels

There are also pending petitions before EPA to regulate emissions from marine vessels, and EPA will have to issue a positive finding that marine vessel emissions of greenhouse gases endanger public health or welfare. To avoid regulating marine vessel emissions, EPA will be required to articulate a reasoned explanation for its refusal to act, which will be difficult or impossible given the threat posed by greenhouse gas emissions from marine vessels and the numerous potential regulatory options available to the agency.

## Fuels

Petitions will also constrain EPA's discretion in the area of marine fuels. Pending petitions place EPA on a course to issue a positive endangerment finding that marine fuels contribute to greenhouse gas pollution that endangers public health or welfare. On the basis of that finding, EPA will likely be required to act to regulate marine fuels, but will have the option to integrate marine fuels regulation into a broader regulatory approach for fuels for all mobile sources.

## EPA May Be Obligated to Issue Nationwide Standards for Greenhouse Gases

Current legal precedent suggests that EPA may be forced to issue national air quality standards for greenhouse gases. While it may be possible to use these standards in a creative way to construct a cap-and-trade program, command-and-control regulations would be costly and potentially unworkable. However, more recent changes to the Clean Air Act make the relevance of older case law unclear, and it may be within EPA's discretion to delay issuing "air quality" standards, especially if it is moving forward with regulations on other fronts.

## Consider Climate Change Effects for Existing Pollutants

While EPA may be able to avoid listing greenhouse gases as "criteria" pollutants and creating national air quality standards, where currently listed pollutants—like particulate matter—have climate change effects, EPA will be required to consider climate change costs when revising standards for those pollutants.

## New Source Review

While there may be some delay, EPA will eventually be required to list greenhouse gases as "regulated pollutants" under the New Source Review program, meaning that all new or modified major sources will be required to install "best available control technology" for their greenhouse gas emissions. EPA will be required to treat many greenhouse gas sources as "major emitting facilities" under the New Source Review program, meaning that preconstruction permits will be required for many facilities, including many relatively small sources of pollution. Finally, whenever issuing permits under the New Source Review program, EPA will be

required to consider the environmental costs of climate change

# Avoiding a Collision with Congress

While EPA is required by law to move forward with greenhouse gas regulations under the Clean Air Act, Congress has taken steps toward adopting cap-and-trade legislation. EPA and Congress are on parallel tracks for now, but there is the potential for redundancy and conflict that will drive up the cost of greenhouse gas reduction.

## Command-and-Control Regulations Are Costly, But Some May Be Required

For decades, economists have generally agreed that whenever possible, it is better to use market-based regulations—like cap-and-trade systems—to achieve environmental goals rather than command-and-control regulations. Market-based regimes give greater flexibility to businesses by demanding economy-wide reductions, but allowing firms to reduce pollution in the cheapest possible manner. Command-and-control regulations, however, require central regulators to prescribe conduct for huge classes of economic

actors, and often impose costly requirements that are not necessary to achieve environmental goals.

However, the language of the Clean Air Act gives EPA only limited flexibility, and there are cases where some form of command-and-control regulation will be necessary to come into compliance with the law. In a recent decision in the Court of Appeals for the D.C. Circuit, a large interstate pollution trading program was struck down because it failed to comply with the statutory terms of the Act—EPA must be careful to avoid a similar fate for its greenhouse gas regulations.

In order to maximize the net benefits of greenhouse gas regulations, EPA should whenever possible adopt market-based incentives. Those market-based programs must be carefully tailored to adhere to the language of the Clean Air Act, while giving businesses maximum flexibility to achieve compliance at the lowest possible costs. However, where the Act clearly requires command-and-control regulations, EPA must fulfill its obligation to carry out the wishes of Congress by adopting those regulations.

### **Best Options for Mobile Source Obligations**

Under the Clean Air Act, once EPA has finalized its endangerment finding for automobiles, it will be required to issue emissions standards. These types of standards—which are command-and-control rather than market-based—could ultimately reduce the efficiency of a cap-and-trade system. Under cap-and-trade, the total economy-wide emissions are set, so emissions standards for cars would not reduce the total amount of greenhouse gases that are produced—it only shifts emissions around. To avoid costs being imposed without greenhouse gas reduction benefits, EPA should tie its auto emissions standards to existing standards, such as federal fuel efficiency standards or greenhouse gas standards adopted by California.

Because aircraft have the capacity to travel internationally and refuel in countries that do not have cap-and-trade restrictions on vehicle fuel, command-and-control regulations for aircraft can deliver climate benefits. Such regulations could include: improving aviation operations and procedures, setting fuel efficiency standards or greenhouse gas emissions standards, or mandating more efficient aircraft design standards. Marine

vessels that travel international would also benefit from these same types of regulations.

Because other nonroad vehicles—such as lawnmowers—cannot refuel internationally, all fuel purchased to run them will be subject to a domestic cap-and-trade legislation. Because there is no value-added for command-and-control regulations such as fuel efficiency, emissions standards, or vehicle design standards, EPA should exercise its discretion not to regulate in this area. Instead, EPA should consider methods of providing information to manufacturers and consumers so they can decide how best to reduce their fuel consumption.

### **Best Options for Stationary Source Obligations**

Many of the mandatory provisions of the Clean Air Act for stationary sources will interfere with the efficient functioning of a cap-and-trade system. Regulations that essentially require control technologies to be adopted limit the flexibility of sources to comply with economy-wide emissions targets, imposing costs without delivering environmental benefits. However, EPA can use its discretion to minimize many of the negative economic consequences for these mandatory provisions, and Congress can ultimately exempt greenhouse gases from the mandatory provisions of the Clean Air Act when it adopts cap-and-trade legislation.

Once greenhouse gases become a regulated pollutant, new major emitters—defined as sources that emit more than 250 tons of greenhouse gases—will be required to adopt “best available technology.” EPA can ensure that this regulation does not impose unnecessary costs on small emitters by: (1) defining “modification” narrowly for greenhouse gases so small increases in emission will not subject firms to regulation; (2) adopting a general permit scheme for small sources; (3) phasing-in permit requirements to target largest sources first; (4) using presumptive standards that focus on energy efficiency.

EPA will also have a duty to adopt new source performance standards within a reasonable time, but has broad authority over the sequencing of

which categories of sources to address. It should begin review of greenhouse gas emissions from already-listed source categories with nitric acid plants, petroleum refineries, and other industrial sources whose emissions may not be fully covered under the cap-and-trade program. This way, EPA will ensure that the standards will serve as a useful supplement to a cap-and-trade program rather than imposing unnecessary costs.

# Creating a Regulatory Cap-and-Trade

The best and most important way for EPA to avoid a collision with Congress is to use its discretionary powers under the Clean Air Act to create a regulatory cap-and-trade system similar to the regimes currently being discussed before Congress.

## A Smooth Transition

If EPA moves forward with a cap-and-trade system and Congress later adopts legislation, then the regulatory program can smoothly transition into a new program under the cap-and-trade statute. In addition, compliance costs that were undertaken to conform to the regulatory cap-and-trade will not be wasted, and will help firms comply with the statutory program. The difficulty for EPA will be ensuring that

such a regulatory approach is designed in accordance with the language of the Clean Air Act—otherwise it will be open to attack in the courts.

## Fuel Trading Program

A cap-and-trade system may not be feasible directly for mobile source *emissions*. However, EPA can institute a cap-and-trade system on the sale and manufacture of vehicle *fuels*. Not only is the statutory language broad and able to incorporate a cap-and-trade system, but a cap on fuel is preferable as an upstream point of regulation offering the greatest administrative simplicity and relatively accurate measurements of actual emissions. A cap-and-trade system for fuels would be able to achieve substantial and efficient GHG emissions reductions in the transportation sector.

## Economy-Wide Cap

In addition to the authority to create a cap-and-trade for vehicle fuels, EPA has a number of options to create an economy-wide cap-and-trade program. Authority to control stratospheric pollution, set air quality standards, or require performance standards can all potentially be used either to create a comprehensive economy-wide cap-and-trade system, or to create cap-and-trade for stationary sources that could work in tandem with a fuel-trading program. These statutory authorities give EPA a great deal of flexibility to create a workable program, although some mandatory duties under the statute, as well as limitations on how the cap-and-trade program must be designed, mean that any regulatory program is likely to be second-best to a legislative approach.

## Auction

Auctioning allowances under a cap-and-trade system avoids windfall corporate profits that would result from the free distribution of allowances to current emitters. Under a regulatory cap-and-trade, EPA would have the power to auction greenhouse gas allowances. While only Congress has the power to impose taxes on the population, an auction of allowances by EPA does not run afoul of the constitutional designation of the taxation power because an

auction of allowances is not a tax—its purpose is not to raise revenue, but instead to affect behavior. Under existing constitutional doctrine, EPA would not be overstepping its authority by auctioning greenhouse gas allowances, and the agency would not be forced to give those allowances away for free to polluters.

### **International Options**

Because greenhouse emissions are a global problem, for any domestic cap-and-trade system to be ultimately successful in significantly mitigating climate change, it must be supplemented by an international regime that covers all major emitting

nations. While the ratification of a treaty by a two-thirds vote of the Senate is one mechanism to conclude an international agreement, it is far more common for either the President on his own authority, or acting according the legislative authority, to create a binding international agreements. Under either “sole-executive” authority, or pursuant to provisions of the Clean Air Act, the President has the power to enter into an international climate regime—the participation of the United States in international climate negotiations need not wait for approval of Congress.

# Introduction

## The Fierce Urgency of Now

In April 2007, the Supreme Court ruled that greenhouse gases—the agents responsible for global climate change—are “air pollutants” under the Clean Air Act (CAA).<sup>1</sup> Yet two years later, the Environmental Protection Agency (EPA) has taken no significant action toward regulating greenhouse gas emissions, despite the agency’s duty to implement the CAA. Congress has similarly achieved only false starts during its recent efforts to enact comprehensive climate change legislation.

Signals this year from the new Congress and from the Obama Administration strongly indicate there may at last be action on both fronts in the near future. EPA faces intense practical and legal pressures to act quickly. To mitigate the environmental and economic costs of climate change, scientific experts agree that the problem of greenhouse gas (GHG) emissions must be addressed soon. EPA also has time-sensitive obligations to respond to court orders and public petitions that request climate change controls. Whether by choice or by force of law, the agency must start moving down the path toward regulation.

Aware of the same scientific reality, Congress also feels compelled to act quickly. Additionally, a looming deadline for international negotiations, as well as political pressure from the White House and the American public, may lock Congress into a tight timeline for drafting climate change legislation. In order to develop a strategy for international negotiations, the White House may push the Senate to show its hand; if the Senate appears unready or unwilling to ratify a climate treaty, the White House may instead seek prompt action from EPA to implement any promises made at the international level.

In the coming weeks and months, EPA and Congress may each begin barreling along separate and possibly irreconcilable courses of action. But before either moves too far in any direction, there is an opportunity to collaborate. Only when both EPA and Congress understand the practical, legal, and political forces that will affect the timing and nature of each other’s actions can the two hope to chart a mutually compatible approach to climate change.



## Climate Change Presents an Immediate Threat

Scientific experts agree there is abundant, persuasive proof of the existence and danger of global climate change.<sup>2</sup> Anthropogenic activities like agriculture, electrical generation, and transportation emit vast and growing quantities of greenhouse gas pollutants into the atmosphere. Once released, greenhouse gases absorb and trap heat that would otherwise escape into space. This phenomenon—known as the “greenhouse effect”—warms the planet, thereby precipitating a host of climatic changes.<sup>3</sup>

Already we can witness rising average air and ocean temperatures, widespread melting of snow and ice caps, and cresting sea levels.<sup>4</sup> From these climatic effects, scientists forecast a range of potentially catastrophic economic, environmental, and political consequences. Temperature fluctuations will disrupt agricultural production, displace ecosystems, and increase human morbidity from heat-related disease. Snowmelt will impact water flows, causing droughts and sparking potentially violent conflicts over dwindling resources. Rising sea levels will force the migration of whole populations due to the loss of dry land. And changing ocean currents will alter weather patterns, increasing hurricanes and other extreme events.<sup>5</sup>

The severity of such risks alone demands swift action to mitigate the costs of climate change, but three factors add to the immediacy of the problem. First, there may be certain temperature “tipping points,” when the environmental consequences of global warming will themselves begin to reinforce the climatic changes. For example, polar ice currently reflects heat away from the planet’s surface; if that ice melts as temperatures rise, more heat will be absorbed by newly exposed land and water, thereby dramatically speeding up global warming.<sup>6</sup> Similarly, if the oceanic heat and salinity dynamics change enough that entire ocean currents shift, the impact on worldwide weather patterns could be unprecedented and unpredictable.<sup>7</sup> It is critical to act before reaching these tipping points.

Second, it will take a good deal of time to make meaningful cuts in the current concentrations of greenhouse gases. Once emitted, many greenhouse gases remain in the atmosphere anywhere from decades to centuries, a much longer lifespan than most other regulated air pollutants.<sup>8</sup> Emissions reductions achieved today may not generate observable benefits until far in the future. Given this delayed response and the imminence of the climate change threats, the window of time for effective action is rapidly closing.

Finally, overall GHG emissions are still on the rise. A few pollutants responsible for global warming are regulated both domestically and internationally, and their emissions have decreased.<sup>9</sup> However, emissions of at least six major greenhouse gases continue to increase: carbon dioxide (CO<sub>2</sub>) is the most frequently emitted greenhouse gas, but methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), sulfur hexafluoride (SF<sub>6</sub>), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs) have also reached dangerous levels.<sup>10</sup> For example, annual global emissions of carbon dioxide grew 80% over the last four decades.<sup>11</sup> While other GHGs are emitted in lower quantities than carbon dioxide, their greater heat-trapping capacities and longer lifespan (i.e., their “global warming potentials”) mean that their relative contributions to climate change remain highly significant.<sup>12</sup>

Though some individual countries have made small reductions to their GHG emissions,<sup>13</sup> global average concentrations are the relevant metric, since the long-lived greenhouse gases become well-mixed and relatively uniform throughout the atmosphere regardless of their country of origin.<sup>14</sup> Global concentrations continue to increase, as the world’s largest emitters of greenhouse gases, like China and the United States (numbers one and two, respectively), have yet to make any definitive international or domestic commitments to cut their emissions.<sup>15</sup> For example, annual U.S. emissions increased during fourteen of the last seventeen years (with a total increase of nearly 20% over that period).<sup>16</sup> Unless the United States makes substantial emissions reductions and sets an



example for the rest of the world, global GHG concentrations are likely to continue to rise, making an already dangerous situation even more perilous and perhaps irreversible.

### **EPA's Legal Obligations Are Time-Sensitive**

For well over a decade, environmental advocacy groups and state governments have frequently petitioned EPA for a federal response to the growing threat of climate change. While none of those petitions has yet prompted affirmative action from the agency, one petition did lead to a crucial ruling by the Supreme Court. In April 2007, the Court held that EPA has authority under the Clean Air Act to regulate GHGs as “air pollutants,” and the Court ordered EPA to ground its response to the petition in science and in the statutory requirements of the CAA.<sup>17</sup> Though the Court did not set a specific schedule for EPA’s required response, in general EPA’s actions are subject to review under a “rule of reason.”<sup>18</sup> EPA must respond to all pending court orders and public petitions in a timely and reasonable manner, and the agency’s responses must reflect the current scientific understanding of the dangers of climate change. In short, EPA can no longer procrastinate or unreasonably delay on formulating some response to the problem of greenhouse gas emissions. These pending petitions and court rulings are discussed in greater detail below, in Chapter One.

### **Congress Faces Political Pressures and International Deadlines**

EPA is not the only government entity under tremendous pressure to act on climate change. Congress also feels the weight of internal and external influences. To start, the twin issues of energy independence and global warming have assumed a more prominent place in the voters’ consciousness in recent years.<sup>19</sup> Responding to their voters’ priorities and to their own assessment of a dire situation, members of Congress have introduced a growing number of legislative proposals and have pushed further in the legislative process each successive term, though they continue to fall short of enacting a final bill.<sup>20</sup> Climate change has even become a signature issue for a few high profile Senators and Representatives, and to some extent they have staked their reputations on passing comprehensive legislation in the near future.<sup>21</sup>

Energy independence and climate change also became central features of the 2008 presidential election,<sup>22</sup> and President Obama has already started moving to fulfill his campaign promises on the issues.<sup>23</sup> Though the White House is exploring all options for the regulation of greenhouse gas emissions, President Obama has expressed a clear preference for Congress to develop new comprehensive legislation, rather than relying exclusively on EPA actions under the CAA.<sup>24</sup>

Despite the desire and pressure to act, many uncertainties continue to surround any congressional action on climate change. The exact timing of the action is unclear, as congressional committees continue to battle in turf wars,<sup>25</sup> and as emerging threats—like the economic recession—begin to monopolize Congress’s attention and resources.<sup>26</sup> Also, the ultimate likelihood of passing legislation is unclear, as proponents of climate change legislation have not yet assembled a filibuster-proof majority coalition in the Senate.<sup>27</sup>

Yet Congress may not have the luxury of unlimited time to deliberate, in light of approaching deadlines for international negotiations. Large segments of the international community are urging the United States to rejoin the global climate treaty process.<sup>28</sup> To date, the United States has refused

Annual U.S. emissions increased during fourteen of the last seventeen years (with a total increase of nearly 20% over that period). Unless the United States makes substantial emissions reductions and sets an example for the rest of the world, global GHG concentrations are likely to continue to rise, making an already dangerous situation even more perilous and perhaps irreversible.

to be party to any international agreement spelling out specific targets for emissions reductions (though it has made non-binding commitments).<sup>29</sup> While several other countries have accepted precise reduction targets under international mechanisms, the promises made have not translated into much real world success; moreover, the commitments do not extend beyond 2012.<sup>30</sup> In December 2009, the United Nations will host a new round of international negotiations to develop a global strategy on climate change.<sup>31</sup> Many believe the negotiations cannot advance far unless the United States signals beforehand that it is ready to take the lead and cut emissions.<sup>32</sup>

Traditionally, after an international agreement has been negotiated and signed by the President, the Senate must ratify the treaty by a two-thirds majority—i.e., 67 “aye” votes are necessary.<sup>33</sup> Currently, proponents of climate change legislation are still struggling to assemble a coalition of 60 Senators willing to vote against a filibuster of climate legislation.<sup>34</sup> The majority necessary to ratify an aggressive climate change treaty may simply not exist in the Senate.

That political reality could increase the pressures for EPA to act. Conceivably, the White House could negotiate an international executive agreement—not a formal treaty, but a collection of mutual promises made by the heads of states.<sup>35</sup> Such an agreement would not need Senate ratification or even new congressional legislation to take effect. Rather, the White House could turn to EPA to implement the agreement, using what existing authority it already has under the Clean Air Act. The viability of an international executive agreement is explored in Chapter Four.

This potential for the executive branch to circumvent the legislature epitomizes the fundamental conflict that the federal government must resolve in order to address climate change effectively. EPA and Congress both face similar pressures to act on climate change, yet they have very different obligations and options for what form their actions may take. Exactly how those two distinct efforts will interact is quickly becoming a pressing question to answer.

### **Urgency Does Not Preclude Rationality**

This Report addresses what actions EPA can take to avoid a collision with Congress on climate change. As EPA and Congress both face practical and legal pressures to act quickly, it is imperative that these institutions work together to weave complimentary approaches. When devising a climate change strategy, these actors must do just that: strategize. They must acknowledge that neither exists in a vacuum, and that the actions of one will directly influence the actions of the other: the right hand must know what the left hand is doing. Only then can the United States hope to develop a comprehensive, rational, and efficient approach to combat climate change.

Part One of this Report identifies the legal obligations that will constrain EPA’s choice of action. The Supreme Court’s 2007 ruling will force EPA to make certain regulatory responses under the Clean Air Act. Those initial required actions will in turn automatically trigger other provisions in the CAA, generating a cascading effect that may produce some unanticipated or unwelcome consequences. But by understanding and anticipating this chain reaction of regulations under the CAA, EPA and Congress can maneuver to minimize the more inefficient and incompatible results.

Part Two of the Report takes a broader look at EPA’s full range of regulatory options. Experts believe that the most cost-efficient method of combating climate change is to limit the nation’s total greenhouse gas emissions and auction off the permits to emit such pollutants. Congressional legislation is the likely vehicle to establish that kind of “cap-and-trade” program, but legislation is not the only alternative. Part Two investigates whether EPA could create a regulatory system using only the CAA that would mimic or preclude the need for cap-and-trade legislation. Such an ability could enable the White House to engage effectively in international negotiations regardless of whether Congress is prepared to ratify a climate treaty.

Part Two then explores the role that EPA's various statutory obligations will play if a cap-and-trade system is in place. This analysis attempts to pinpoint both potential inefficiencies and opportunities for synergistic action. Some regulations may be compatible with legislation as supplements, augmenting the efficiency or efficacy of the system. Other regulations may be valuable as bridges or precursors, serving as a temporary stop-gap or a jumping off point for a subsequent, more complete cap-and-trade approach. But several regulatory options—including some mandatory actions and some plans favored by environmental advocates—may in fact be redundant, detrimental, or otherwise incompatible with cap-and-trade. Part Two identifies EPA's best options to minimize the potential inefficiencies generated by its mandatory obligations.

By investigating these issues, the Institute for Policy Integrity hopes to provide EPA and Congress with some guidance and perspective as they move forward. Climate change is an urgent problem of immense complexity and scope, and devising a solution will demand the attention, resources, and coordinated efforts of the entire federal government. As EPA and Congress begin to formulate their responses, they must check to ensure they are not locked in to a collision course. Urgency need not produce haphazard or conflicting results; with some deliberation and rationality, climate change can be addressed both responsibly and without delay.

# Part One

## EPA's Obligations Under the Clean Air Act and *Massachusetts v. EPA*

*"[T]he Clean Air Act of 1970 is complex and demanding enough to keep lawyers, engineers, and environmentalists busy for all of their life times. It seems to me that we have created a maze into which only the foolhardy attempt to enter and from which only the exhausted, depleted, and defeated emerge."*<sup>36</sup>

—Senator Barry Goldwater, 1976

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# A Complex Statute

This Part attempts to demystify a complex, demanding statute and to tease out EPA's legal obligations under the Clean Air Act in light of court orders, principles of administrative law, and the realities of science.

## ***Massachusetts v. EPA***

In its April 2007 ruling in *Massachusetts v. EPA*, the Supreme Court made three broad determinations that will trigger several mandatory responses by EPA under various provisions in the Clean Air Act:

First: The Clean Air Act's definition of "air pollutant" is both "sweeping" and "unambiguous" and includes greenhouse gases.<sup>37</sup>

Second: When EPA is petitioned by the public, the Court will strike down any response that is not supported by "reasoned justification" or that does not "conform to the authorizing statute."<sup>38</sup>

Third: "The harms associated with climate change are serious and well recognized."<sup>39</sup>

Although *Massachusetts v. EPA* focused on one specific public petition that sought the regulation of only some greenhouse gases from motor vehicles, the Court's determinations are clearly and directly applicable to a wide range of statutory provisions, and they will ineluctably and automatically trigger a number of statutory requirements for EPA action.

## **EPA Does Not Have Limitless Discretion**

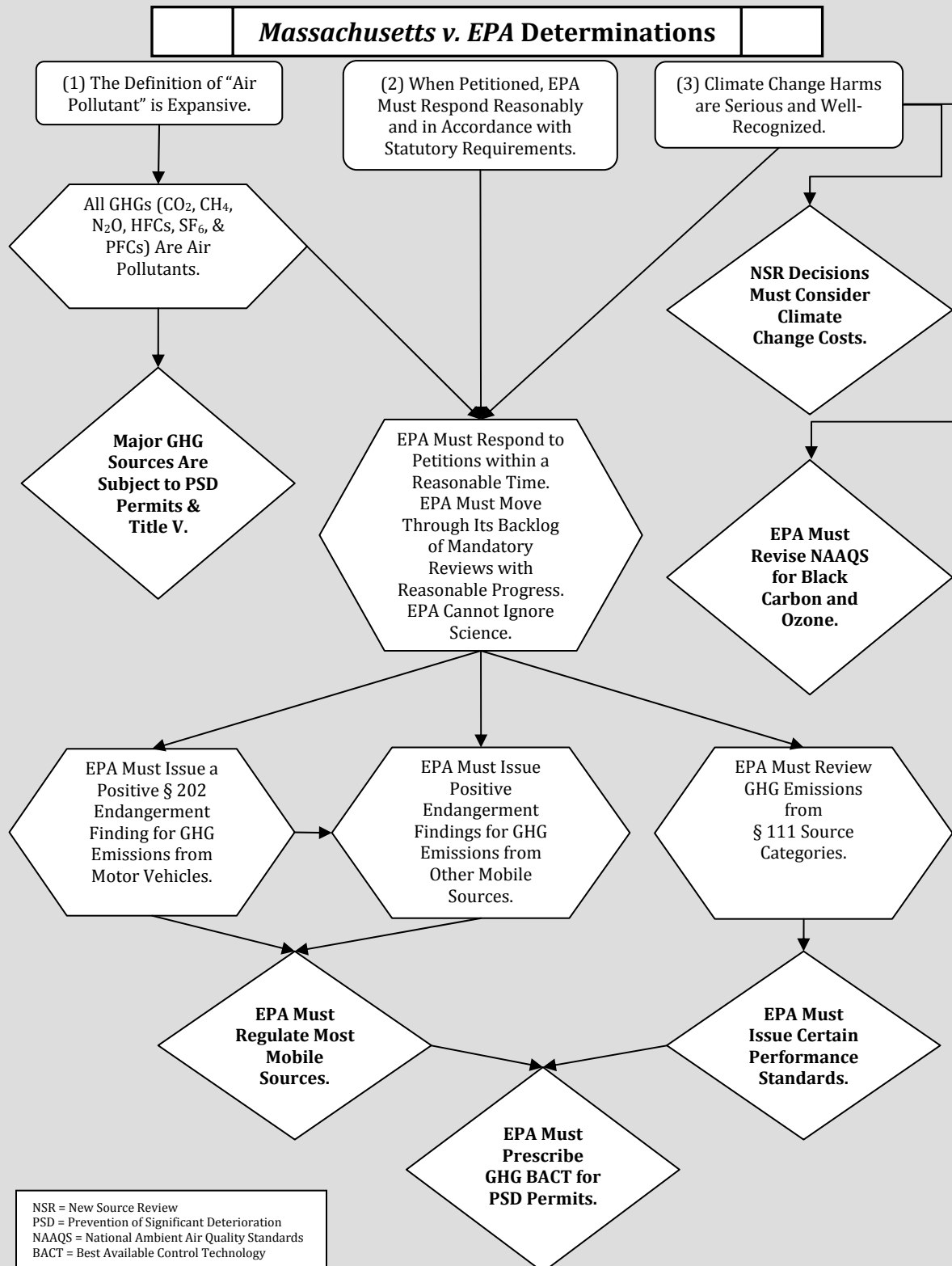
Which actions EPA must take under the Clean Air Act will turn largely on EPA's discretion to interpret statutory requirements, make judgment calls, and schedule activities according to its own

priorities. As the Supreme Court noted in *Massachusetts v. EPA*, however, principles of administrative law place limits on EPA's discretion. The standards for judicial review of agency actions provide clear indicators of the extent of EPA's discretion. Generally, courts will defer to EPA's determinations but will insist that all interpretations, actions, and response times follow a fundamental "rule of reason." EPA will not be able to avoid plain statutory instructions, ignore the basic scientific record, or indefinitely postpone a required action. In particular, EPA must respond to pending petitions for rulemakings in a reasonable time period and in a reasonable manner. (For a more detailed examination of this "rule of reason" and other principles of administrative law, see the Appendix.)

## **EPA Must Regulate**

This Part first will review the Supreme Court's ruling in *Massachusetts v. EPA* in greater detail and will explore the current legal landscape of pending court orders and public petitions for rulemakings. Then this Part will examine EPA's obligations under the Clean Air Act relating to greenhouse gas emissions from mobile sources. Finally, this Part will analyze EPA's statutory obligations to regulate stationary source emissions. The following flowchart illustrates the fundamental conclusion of this analysis: the current legal landscape will generate a cascading effect of statutory obligations to regulate greenhouse gas emissions. EPA cannot avoid these results, but the agency can minimize the more unwelcome consequences of these obligations. EPA's best options for responding to its obligations are discussed later, in Part Two.

## Flowchart of EPA's Legal Obligations



# Chapter One

## The Current Legal Landscape

In April 2007, the Supreme Court held that EPA has authority to regulate greenhouse gases under the Clean Air Act, and the Court ordered EPA to respond to a public petition for the regulation of motor vehicle emissions. This Chapter will explain the legal obligations created by the Supreme Court ruling in *Massachusetts v. EPA*, as well as the necessity to act created by other court cases and by pending public petitions for rulemaking.

Section A offers a brief overview of the history and structure of the Clean Air Act.

Section B will explain the holding and legal underpinnings of the Supreme Court's decision in *Massachusetts v. EPA*. That decision involved a public petition, filed in 1999, requesting EPA to regulate GHG emissions from motor vehicles. EPA initially denied that petition, but the Supreme Court ruled against EPA, requiring it to make a more formal and exhaustive response, and restricting the form of that response in certain ways. More than two years after the decision, and a full ten years after the petition was originally filed, EPA has not yet complied with the Court's order. EPA, however, began proposing a complete response in April 2009. That proposed response consists of a formal scientific finding that GHG emissions from motor vehicles endanger public health and welfare, but does not include any specific regulatory proposals for motor vehicle emissions.

Section C will survey various other public petitions for rulemaking and other relevant court challenges that may place pressure on EPA to act. Mainly, the state of California has applied to EPA for a waiver from preemption under the CAA, allowing it to regulate GHG emissions from motor vehicles in the state. Although EPA initially denied that petition, EPA has recently reopened and begun reexamining that decision, and the Obama Administration will most likely grant this waiver by June 2009. Additionally, other pending petitions—many of which have languished for years in the agency's bureaucracy—request federal action to regulate GHG emissions from various sources, including aircraft, marine vessels, nonroad vehicles, and marine fuel. As a responsible regulator following basic administrative law principles, EPA must respond to these petitions in a timely



manner. Finally, a few key pending lawsuits and court orders on remand to EPA will force the agency to consider the costs of climate change in new regulatory contexts.

## **A. History and Structure of the Clean Air Act**

The Clean Air Act (“CAA”) began to take its current shape in 1970, but Congress substantially amended the Act in 1977 and again in 1990.<sup>40</sup> The Act seeks to develop a comprehensive, national approach to controlling dangerous air pollution. The main goal of the legislation is to protect the public health and the public welfare,<sup>41</sup> which the statute defines broadly:

All language referring to effects on welfare includes, but is not limited to, effects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and *climate*, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.<sup>42</sup>

The Act is divided into six titles based roughly on the source or type of pollution. Title I focuses principally on stationary sources and also requires state governments to achieve and maintain certain limits on a few widespread pollutants.<sup>43</sup> Title II provides EPA with comprehensive authority to set emissions standards for mobile sources—including cars, trucks, snowmobiles, farm and construction equipment, marine engines, aircraft, and locomotives—as well as the fuels that power them.<sup>44</sup> Title III contains general provisions and definitions. Most importantly, that Title gives a broad definition to “air pollutant,” a term used throughout the Act:

The term “air pollutant” means any air pollution agent or combination of such agents, including any physical, chemical, biological, radioactive (including source material, special nuclear material, and byproduct material) substance or matter which is emitted into or otherwise enters the ambient air.<sup>45</sup>

EPA’s interpretation of whether GHGs fit within this definition has shifted over time,<sup>46</sup> but the Supreme Court recently settled the issue in the affirmative.<sup>47</sup> Title IV creates a special trading program to combat acid rain pollution.<sup>48</sup> Title V sets up a general scheme for permitting,<sup>49</sup> and Title VI regulates pollutants affecting the stratosphere, especially the ozone layer.<sup>50</sup>

Historically, regulations under the CAA have proven to be effective, flexible, and cost-efficient. For example, EPA’s mobile source regulations under Title II have resulted in major reductions in pollution (estimated in millions of tons) and in pollution-related deaths (estimated in tens of thousands per year), typically with a projected benefit-cost ratio of 5:1 to 10:1, or more.<sup>51</sup> The Act grounds regulations in science and encourages technological development.<sup>52</sup> It has also served as the basis for comprehensive monitoring and cataloging of national emissions.<sup>53</sup> The Act sets up a public and transparent process, and it fosters coordination between federal agencies and with the states.<sup>54</sup>

Various sections of the Act establish specific petition processes through which the public or local governments can request new federal regulations.<sup>55</sup> More generally, the public can petition EPA for rulemakings using the Administrative Procedure Act.<sup>56</sup> Public petitions have been an important and driving force throughout the history of Clean Air Act regulations.<sup>57</sup>

## **B. *Massachusetts v. EPA***

This section discusses the Supreme Court decision in *Massachusetts v. EPA* and its aftermath, focusing on the statutory basis for the challenge, its procedural history, the Supreme Court’s opinion, and EPA’s subsequent actions.

### **B.1. Statutory Basis for the Motor Vehicles Petition**

The petition that eventually led to the Supreme Court case *Massachusetts v. EPA* sought specific regulation under a particular provision of the Clean Air Act. To understand the history and import of the petition and subsequent court order, it is useful first to review the structure of the particular statutory provision.

Section 202 gives EPA authority to regulate emissions from “motor vehicles,” which include: cars, light-duty trucks (pick-up trucks and SUVs), heavy-duty trucks, buses, and motorcycles.<sup>58</sup> Some provisions in Section 202 address specific model years and emissions of existing motor vehicles.<sup>59</sup> Section 202(a)(1) provides broad authority to regulate “new” motor vehicles and engines:

The [EPA] Administrator *shall* by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare. Such standards shall be applicable to such vehicles and engines for their useful life . . .<sup>60</sup>

There are two important prerequisites for regulation under this section. First, a regulated pollutant must qualify as an “air pollutant.” Second, EPA must make a positive endangerment finding—that is, EPA must determine that the air pollutant “cause[s], or contribute[s] to, air pollution which may reasonably be anticipated to endanger public health or welfare.”

By using the word “shall,” Section 202(a)(1) mandates that if these two conditions are satisfied then EPA must set “standards applicable to the emission” of the air pollutant.<sup>61</sup> The standards must be applicable to such vehicles and engines for their

“useful life.” EPA must also afford regulated entities sufficient time to come into compliance given the available technology and compliance costs.<sup>62</sup> The standard can also be technology-forcing—that is, it may pressure the development of new technology—if EPA finds that such technological advances are achievable in the available lead time and if such advances are necessary to obtain appropriate reductions.<sup>63</sup>

Current EPA regulations promulgated under this section limit emissions per mile traveled; regulated pollutants include carbon monoxide, nitrogen oxides, particulate matter, and formaldehyde.<sup>64</sup> EPA has exercised authority—so far unchallenged—to prescribe average emissions standards for these pollutants, thereby permitting manufacturers to average emissions within their new car fleets and lower compliance costs.<sup>65</sup>

The choices and determinations EPA makes in its finalized endangerment finding will set the tone for subsequent regulatory actions and will constrain the agency’s regulatory choices in the future. The Court’s ruling in *Massachusetts v. EPA* places the agency on a one-way track with few exits; once EPA finalizes its endangerment finding, it will be moving forward along that track.

### **B.2. Procedural History of the Motor Vehicles Petition**

In 1999, the International Center for Technology Assessment and other public advocacy organizations filed a petition with EPA. The petition sought the regulation of GHG emissions from motor vehicles, which endanger public health and welfare by significantly accelerating climate change.<sup>66</sup> The transportation sector is the second-largest contributor to national GHG pollution, accounting for about 28% of total U.S. emissions.<sup>67</sup> Motor vehicles emit carbon dioxide, methane,

and nitrous oxide through the combustion of fossil fuel.<sup>68</sup> Leaking air conditioners also contribute hydrofluorocarbon emissions.<sup>69</sup> The petition requested regulation of those four greenhouse gases emitted from motor vehicles.

EPA denied the petition in 2003, reasoning that it lacked authority under the CAA to regulate GHGs, and therefore GHGs could not be defined as “air pollutants” under the Act.<sup>70</sup> Even if EPA had such authority, the agency felt it would not be appropriate to issue regulations at that time because global warming “cannot be unequivocally established.”<sup>71</sup> EPA also listed various policy rationales not to regulate, including: a preference for voluntary measures over mandatory controls, a preference for a more comprehensive approach to climate change, and a concern that unilateral reductions by the United States without international coordination may impair efforts to persuade other countries to reduce their emissions.<sup>72</sup> The petitioners, joined then by various cities and states (notably including Massachusetts), brought suit in the U.S. Court of Appeals for the District of Columbia to challenge EPA’s denial of their petition. In 2005, that court ruled in favor of EPA,<sup>73</sup> and the plaintiffs subsequently sought review by the Supreme Court.

### **B.3. Supreme Court Rules Against EPA**

On April 2, 2007, the Supreme Court issued *Massachusetts v. EPA*, a 5-4 landmark decision holding that EPA had authority under the CAA to regulate greenhouse gas emissions from new motor vehicles.<sup>74</sup>

First, when dismissing concerns over plaintiffs’ standing to sue,<sup>75</sup> the Supreme Court recognized the effects of climate change. The Supreme Court highlighted that “[t]he harms associated with climate change are serious and well recognized,” potentially including “a precipitate rise in sea levels by the end of the century,” “irreversible changes to natural ecosystems,” “a significant reduction in water storage in winter snowpack in mountainous regions,” and an “increase in the spread of disease.”<sup>76</sup>

Second, the Supreme Court held that the CAA was unambiguous: the “capacious definition” of the term “air pollutant” embraced carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons.<sup>77</sup> The Court stressed that, by using the broadly-defined term “air pollutant,” Congress intended to confer “regulatory flexibility” on EPA to cope with changing circumstances and scientific developments—even if Congress did not originally intend or consider whether Section 202 could be used to address climate change.<sup>78</sup>

The Supreme Court also rejected EPA’s argument that it was not permitted to regulate GHG emissions from motor vehicles because it would have to tighten fuel efficiency standards (also called Corporate Average Fuel Efficiency standards, or “CAFE”), which are the province of the Department of Transportation.<sup>79</sup> There is some overlap between motor vehicle GHG emissions standards and fuel efficiency standards, because GHG emissions per mile traveled decrease if fuel consumed per mile traveled decreases. However, the Supreme Court found no irreconcilable conflict: “That [the Department of Transportation] sets mileage standards in no way licenses EPA to shirk its environmental responsibilities . . . . [T]he two obligations may overlap, but there is no reason to think the two agencies cannot both administer their obligations and yet avoid inconsistency.”<sup>80</sup>

Finally, the Supreme Court ruled that agency discretion did not permit EPA to ignore its statutory mandate. “Under the clear terms of the Clean Air Act, EPA can avoid taking further action only if it determines that greenhouse gases do not contribute to climate change or if it provides some reasonable explanation as to why it cannot or will not exercise its discretion to determine whether they do.”<sup>81</sup> The Court refused to debate EPA’s “laundry list” of policy judgments justifying its refusal to make an endangerment finding, and held EPA had no authority to rely on policy reasons

unrelated to the statutory question of whether GHGs endanger public health or welfare.<sup>82</sup> The Court ruled that EPA had not provided a reasoned explanation grounded in the statute for its refusal to consider regulation and, therefore, had acted arbitrarily and capriciously.<sup>83</sup> Consequently, the Court remanded the case for EPA to review its inaction on GHG emissions.

#### **B.4. EPA's Insufficient Response to Date**

Although the Supreme Court gave EPA discretion on the timing of its response,<sup>84</sup> EPA must still respond to the opinion. In April 2008, plaintiffs were still awaiting a response and sought a court order from the D.C. Circuit to force EPA to comply with the Supreme Court ruling. The court denied that request, reasoning that the passage of one year was not enough time to hold that EPA had failed to comply.<sup>85</sup> Now, however, EPA has just passed the second anniversary of that decision but has still not adequately responded to that Supreme Court mandate.

As an initial reaction to the ruling, in May 2007, President Bush set a goal to reduce gasoline consumption by 20% over the next ten years,<sup>86</sup> and issued a directive for EPA, working with other agencies, to promulgate GHG regulations for new motor vehicles.<sup>87</sup> In December 2007, President Bush also signed legislation to authorize funding for EPA to “develop and publish a draft rule not later than 9 months after the date of enactment of this Act . . . to require mandatory reporting of GHG emissions above appropriate thresholds in all sectors of the economy of the United States.”<sup>88</sup>

In early December 2007, EPA transmitted to the White House Office of Management and Budget a fully-drafted *Federal Register* notice announcing an affirmative endangerment determination on greenhouse gases.<sup>89</sup> This draft was based on extensive scientific study and was personally approved by EPA's Administrator at the time, Stephen Johnson.<sup>90</sup> The draft contained a finding that the six major GHG emissions are reasonably anticipated to endanger public welfare, but it did not make a determination on their effects on public health.<sup>91</sup> Of the four GHGs emitted from motor vehicles, the draft only made a finding that carbon dioxide emissions from motor vehicles “cause or contribute” to the GHG air pollution that endangers public welfare.<sup>92</sup>

Moments after EPA e-mailed the documents to the White House for review on December 5, 2007, the White House Deputy Chief of Staff, Joel Kaplan, called EPA Administrator Stephen Johnson. Kaplan relayed to Johnson instructions from the White House to retract the e-mail and say the documents were sent in error.<sup>93</sup> According to a recent congressional investigation, several senior officials from the Bush Administration had held a series of meetings with oil industry representatives, and together decided that “regulations to reduce greenhouse gas emissions would tarnish the President's antiregulatory legacy.”<sup>94</sup> They convinced the Office of the Chief of Staff to reverse course on climate change.

At first Administrator Johnson resisted these efforts to quash the endangerment findings. But by February 2008, according to one senior EPA official, it had become “abundantly clear that the White House did not want to move forward with a response [on climate change].”<sup>95</sup> By spring of 2008, EPA had dropped its plans to propose broad regulation of greenhouse gas emissions from motor vehicles, power plants, and other sources. Instead, the White House wanted EPA to issue “advanced notice” of intentions to propose regulations eventually—an announcement simply to “emphasize the complexity of the challenge,” which would “not establish a path forward or a framework for regulation.”<sup>96</sup>

Consequently, EPA issued a much more limited and preliminary “Advanced Notice of Proposed Rulemaking” in July 2008 that discussed various regulatory approaches and contained no endangerment finding.<sup>97</sup> Rather, the ANRP only described options and questions to be considered for possible greenhouse gas regulations under the Clean Air Act, and its primary purpose was to

gather information on how to comply with the Supreme Court's mandate.<sup>98</sup> Among other issues, EPA specifically requested comments on the following topics: the advantages and disadvantages of regulating GHGs using various parts of the Clean Air Act; how those different statutory parts can be integrated into a coherent regulatory regime; considerations for future climate change legislation; conflicts between a Clean Air Act GHG regulatory regime and any future legislation; scientific data on whether GHGs pose a danger to public health or welfare; and information regarding alternative methods of reducing GHG emissions.

EPA justified issuance of an ANRP, as opposed to proposed regulations or an endangerment finding, by reasoning: (1) "a decision to control any source of greenhouse gas emissions [including motor vehicles] could or would impact other Clean Air Act programs with potentially far-reaching implications for many industrial sectors";<sup>99</sup> and (2) the enactment of the Energy Independence and Security Act on December 19, 2007, which directed the Department of Transportation to increase the stringency of fuel efficiency standards, "changed the policy context for any action EPA might take in response to the [*Massachusetts v. EPA*] decision."<sup>100</sup> Therefore, EPA needed more time and thought before acting. EPA received comments on the ANRP through November 27, 2008, but EPA never progressed to the next stage in the rulemaking process—namely, proposing endangerment findings or specific regulations.

Although it may be a preliminary step in a responsive rulemaking process, the ANPR, in and of itself, is unresponsive to the Supreme Court's remand.<sup>101</sup> EPA's rationale for delay is disturbingly similar to those policy rationales that EPA put forward in 2003 to justify its preference not to regulate—the same preference that the Supreme Court expressly held was invalid and irrelevant to the endangerment determination.<sup>102</sup> Furthermore, the Court has already ruled that EPA cannot excuse its delays or inaction by citing the Department of Transportation's authority to issue fuel efficiency standards.<sup>103</sup> To respond properly to the Court's order, EPA will have to continue the rulemaking process.

### **B.5. EPA Plans for a Complete Response**

In April 2009, EPA proposed a rule requiring various sources to report their GHG emissions,<sup>104</sup> finally carrying out the mandate set by Congress and President Bush in December 2007.<sup>105</sup> If finalized, the rule will establish federal, broadly applicable requirements to monitor emissions of the six major greenhouse gases, as well as other gases with global warming potentials (e.g., nitrogen trifluoride and hydrofluorinated ethers).<sup>106</sup> It would apply to: most suppliers of fossil fuels or industrial GHGs; manufacturers of vehicles or engines; facilities with certain categories of GHG emissions sources;<sup>107</sup> and facilities that emit 25,000 metric tons or more of carbon dioxide-equivalent units per year.<sup>108</sup> Stationary sources would begin to submit reports on their emissions to EPA in 2011, and vehicle and engine manufacturers would begin reporting for model year 2011.<sup>109</sup>

EPA is promulgating this rule under CAA provisions that allow the agency to gather information from polluters as necessary to carry out any part of the CAA.<sup>110</sup> Through this rule, EPA seeks to improve the development of future national inventories for particular source categories or sectors, by advancing the understanding of GHG emission processes and monitoring methodologies—and then using that information to make endangerment findings and develop future climate change policy. The proposal specifically notes that this rule does not affect any final decisions on the issues raised by the 2008 ANPR.<sup>111</sup>

On April 17, 2009, President Obama's new EPA Administrator, Lisa Jackson, signed a proposed endangerment finding—approved by the White House and slated for publication in the *Federal Register* by the end of April 2009.<sup>112</sup> After a sixty-day comment period and two public hearings,

EPA plans to finalize that finding, which purports to be a complete response to the Supreme Court decision. In this proposal, EPA takes the following actions:

- Provides that the definition of “air pollution” under the CAA includes the total collective elevated concentrations of the six GHGs (CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs, and SF<sub>6</sub>). EPA justifies this definition because the risks associated with climate change are not evaluated on a gas-by-gas basis in the scientific literature, and the ultimate objective is to stabilize and reduce the atmospheric concentrations of all GHGs. EPA may later consider future endangerment findings for additional climate forcers such as black carbon and water vapor contrails.<sup>113</sup>
- Exercises its discretion to define “air pollutant” differently in different statutory contexts, either as the collective group of six GHGs or as each individual gas. EPA believes that even if it defines all GHGs collectively as a single air pollutant, EPA would still have discretion to set standards that control either the whole group or individual gases as constituents of the class.<sup>114</sup>
- Makes a finding that air pollution of the six GHGs is reasonably anticipated to endanger both public health and welfare.<sup>115</sup>
- Finds that GHG emissions from motor vehicles contribute to the air pollution of GHGs.<sup>116</sup>
- Does not propose specific regulations.

The choices and determinations EPA makes in this endangerment finding will set the tone for subsequent regulatory actions and will constrain the agency’s regulatory choices in the future. The Court’s ruling in *Massachusetts v. EPA* placed the agency on a one-way track with few exits; once EPA finalizes this endangerment finding, it will be moving forward along that track.

## **C. Pending Petitions and Legal Challenges Demand Action**

While EPA may be locked on a one-way track, the agency still retains some control over how quickly it moves forward. However, other external factors may force the agency to speed up. This Section surveys the various other pending petitions, lawsuits, and court orders that request or may require EPA to take action. For example, California has applied to EPA for a waiver from preemption under the CAA, allowing it to regulate GHG emissions from motor vehicles in the state. Although EPA initially denied that petition, EPA has recently reopened and begun reexamining that decision, amid a flurry of media and public attention. The Obama Administration has indicated that it will most likely decide to grant this waiver, and Congress has set a firm deadline for EPA to act by June 2009.

Additionally, other notable pending petitions—many of which have languished for years in the agency’s bureaucracy—request federal action to regulate GHG emissions from various sources. As a responsible regulator following basic administrative law principles, EPA must respond to these petitions in a timely manner.<sup>117</sup> Finally, a few key pending lawsuits and court orders on remand to EPA will force the agency to consider the costs of climate change in new regulatory contexts.

### **C.1. California’s Application for a Waiver**

In 2005, California applied to EPA for permission to enforce its own regulations of GHG emissions from motor vehicles in the state. Generally, the Clean Air Act expressly preempts state regulation of most mobile source categories, including new motor vehicles.<sup>118</sup> However, when Congress originally created Title II of the Act to regulate mobile sources, California had already established

some state-level motor vehicle regulations.<sup>119</sup> Therefore, in order to “afford California the broadest possible discretion in selecting the best means to protect the health of its citizens and the public welfare,”<sup>120</sup> Congress allowed California to petition EPA for waivers of federal preemption.<sup>121</sup> Other states cannot directly petition EPA for a waiver, but they may adopt California’s standards under certain conditions.<sup>122</sup>

To be granted a waiver under Section 209(b) of the CAA, California must first demonstrate that its standards are at least as protective as the applicable federal standards. EPA may deny the request if the Administrator finds: California’s determination on protectiveness is arbitrary and capricious; California does not need the standards to meet compelling and extraordinary conditions; or California’s standards are not consistent with statutory requirements for adequate lead-time and technological feasibility.<sup>123</sup> EPA generally grants California broad discretion in developing motor vehicle regulations,<sup>124</sup> and the agency has issued almost every waiver requested by California.<sup>125</sup>

Even for required action, EPA typically retains discretion on timing and prioritizing its regulatory docket. However, external factors—such as pending petitions and legal challenges—**may force the agency to speed up its response.**

In 2004, at the behest of the California legislature,<sup>126</sup> the California Air Resources Board adopted a comprehensive set of GHG emissions regulations for

new passenger vehicles and light duty trucks, beginning with model year 2009.<sup>127</sup> The regulations establish fleet average standards and grant manufacturers flexibility in determining how best to meet the GHG emissions standards.<sup>128</sup> The regulations aim to reduce vehicle GHG emissions approximately 30% by 2030 (compared to the 2002 fleet average).<sup>129</sup>

In December 2005, California applied to EPA for a waiver so it could enforce its GHG regulations.<sup>130</sup> EPA delayed making a decision in order to wait for the outcome of *Massachusetts v. EPA*.<sup>131</sup> Since then, seventeen other states have adopted or proposed California’s GHG regulations (though they cannot enforce those standards unless EPA grants California its waiver first).<sup>132</sup> While the waiver decision was pending, two district courts held that state adoption of GHG regulations are not preempted by federal fuel efficiency standards—provided EPA grants the waiver.<sup>133</sup>

According to a recent investigation by the House of Representatives, career staff at EPA unanimously supported granting California’s petition, as did Administrator Johnson. However, Johnson reversed his position after communications with officials in the White House.<sup>134</sup> In December 2007, Administrator Johnson finally wrote a letter to California Governor Arnold Schwarzenegger denying California’s request.<sup>135</sup>

EPA did not release the formal legal reasoning for that decision until it was published in March 2008 in the *Federal Register*.<sup>136</sup> Johnson’s primary legal justification was that Section 209 of the Clean Air Act was not “intended to allow California to promulgate state standards for emissions from new motor vehicles designed to address global climate change problems.”<sup>137</sup> In the alternative, he reasoned that he did not believe “the effects of climate change in California are compelling and extraordinary compared to the effects in the rest of the country.”<sup>138</sup> Consequently, California did not need its own program to address climate change concerns. Additionally, Johnson reasoned the regulations were unnecessary because new congressional legislation had recently instructed the Department of Transportation to increase national fuel economy standards, which would be more effective in reducing GHG emissions than any individual state standards.<sup>139</sup>



California requested reconsideration of the decision, and then filed a lawsuit in the D.C. Circuit in May 2008 challenging the EPA's denial.<sup>140</sup>

In February 2009, President Obama's newly-appointed EPA Administrator, Lisa Jackson, issued a formal notice of reconsideration of the denial.<sup>141</sup> Jackson decided to reopen the issue because the "waiver denial significantly departed from EPA's longstanding interpretation of the Clean Air Act's waiver provisions and from the Agency's history . . . of granting waivers to California for its new motor vehicle emission program;" and "since the denial was issued, California, States interested in implementing California's standards, members of Congress, scientists, and other stakeholders have identified a number of concerns regarding EPA's decision."<sup>142</sup> Moreover, in March 2009, Congress slipped a legislative rider into an appropriations bill that places EPA under a June 30, 2009 deadline to make a decision regarding the California waiver.<sup>143</sup>

Given the recent statements of President Obama and Administrator Jackson,<sup>144</sup> EPA will most likely grant California's petition by the congressional deadline. This action will affect how EPA approaches the issue of GHG regulations both for motor vehicles and in general. Approving the waiver will force EPA to consider these realities.

## **C.2. Other Pending Rulemaking Petitions**

In addition to the petition involved in *Massachusetts v. EPA* (originally filed in 1999) and California's application for a waiver, there are other key petitions still pending before EPA. These petitions, mostly focusing on mobile sources, request EPA to undertake various federal rulemakings to regulate GHG emissions under the CAA, including:

- *Marine Vessels:* In October 2007, California filed a petition asking EPA to reduce GHG emissions, particularly carbon dioxide, from marine vessels (i.e. ships).<sup>145</sup> Earthjustice and other environmental organizations filed a similar petition that same month.<sup>146</sup> The petitions argue that Section 213 of the CAA authorizes EPA to regulate upon making an endangerment finding, and while there is no mandatory obligation, EPA's ability to choose not to make the endangerment finding is constrained by the Supreme Court's decision in *Massachusetts v. EPA*.<sup>147</sup> The petitions request that: EPA make a positive endangerment finding that that carbon dioxide emissions from new marine engines and vessels significantly contribute to air pollution which may reasonably be anticipated to endanger public health and welfare; and EPA propose and adopt emissions limitations and other regulations for those sources.<sup>148</sup> Notably, the Earthjustice petition also requests that EPA use its authority under Section 211 for fuels and adopt regulations controlling the content or type of fuel manufactured and sold for use in marine vessels.<sup>149</sup>
- *Aircraft Engines:* In December 2007, California and six other state and local governments filed a petition asking EPA to exercise its authority to regulate GHG emissions, specifically carbon dioxide, from new and existing aircraft and aircraft engine operations.<sup>150</sup> That same month Earthjustice and other environmental organizations filed a similar petition.<sup>151</sup> The petitions argue that EPA has a mandatory duty to control GHG emissions from aircraft, and they request the following: EPA make an explicit finding that GHG emissions from aircraft engines cause or contribute to air pollution which may reasonably be anticipated to endanger public health and welfare; and EPA propose and adopt emissions limitations or other regulations for those sources.<sup>152</sup>
- *Other Nonroad Engines and Vehicles:* In January 2008, California and five other states submitted a petition requesting EPA to regulate GHG emissions, mainly carbon dioxide, from all new nonroad engines other than aircraft, marine vessels, and locomotives.<sup>153</sup> On

the same day environmental organizations filed a similar petition.<sup>154</sup> The petitions argue that although section 213 of the CAA does not require EPA to regulate upon making an endangerment finding, EPA's discretion to make the endangerment finding is constrained by the Supreme Court's decision in *Massachusetts v. EPA*. The petitions request the following: EPA make a positive endangerment finding for GHG emissions from nonroad engine and vehicles; and EPA adopt emissions limitations or other regulations for such sources.<sup>155</sup>

- *Stationary Source Performance Standards*: In 2008, environmental groups petitioned EPA to reconsider its final performance standards for petroleum refineries and to revise such standards by covering greenhouse gas emissions. On December 22, 2008, EPA reconsidered some issues relevant to these performance standards, but the agency reserved judgment on the greenhouse gas issue.<sup>156</sup> EPA has taken no further actions on this petition.<sup>157</sup>

In its July 2008 ANPR, EPA mentioned the pending mobile source petitions and possible associated concerns, but the agency did not issue a direct response.<sup>158</sup> Shortly thereafter, California and other local governments submitted a letter to EPA formally stating their intent to sue if EPA does not directly respond to their petitions.<sup>159</sup> It appears that these states have yet to file a formal litigation challenge.<sup>160</sup>

These petitions are discussed further in Chapters Two and Three, as they will curtail EPA's ability to choose not to regulate certain sources. EPA will need to respond to these pending petitions in a timely manner, and EPA will undoubtedly receive future petitions to regulate GHG emissions from various sources.

### **C.3. Other Legal Challenges**

The following other legal challenges related to GHG emissions are currently pending or on remand to EPA:

- *Power Plants (Steam Generating Units)*: In 2006, EPA revised the new source performance standards for electric utilities and other steam generating units. The regulations did not include any emissions standards for carbon dioxide, even though power plants are the largest source of carbon dioxide emissions from fossil fuel combustion. Several states and local governments filed a petition for review in the D.C. Circuit Court of Appeals. On September 24, 2007, the court remanded the case to EPA "for further proceedings in light of *Massachusetts v. EPA*."<sup>161</sup> Despite the remand, EPA has not yet proposed new source performance standards for carbon dioxide emissions from power plants.<sup>162</sup>
- *Stationary Source Permits*: For all "regulated pollutants," new and modified stationary sources are required to install controls as part of a permitting process. In November 2008, EPA's Environmental Appeals Board ruled that it was not clear whether carbon dioxide was a "regulated pollutant" for such purposes.<sup>163</sup> The Board remanded the issue to EPA for reconsideration.<sup>164</sup> Many states are involved in this permitting process, and some similar legal battles have erupted at the state level. For example, Kansas refused to issue a permit to a new power plant on the grounds that it did not control its carbon dioxide emissions.<sup>165</sup> The Kansas Legislature is currently considering a bill to overturn this permit denial,<sup>166</sup> and the power plant has sued the state in federal court claiming a constitutional equal protection violation.<sup>167</sup>
- *Nitric Acid Plants*: In February 2009, two environmental organizations brought suit in D.C. Circuit district court to force EPA review of the nitrous oxide emissions from nitric acid

manufacturing plants.<sup>168</sup> EPA has not reviewed new source performance standards for nitric acid plants since 1984, despite statutory schedules for periodic review.<sup>169</sup>

- *Particulate Matter and Ozone NAAQS*: Particulate matter (specifically black carbon) and tropospheric ozone have significant implications for climate change. In February 2009, the D.C. Circuit Court of Appeals remanded to EPA its national ambient air quality standards for particulate matter. While the case did not discuss climate change directly, the court generally ordered EPA to consider all relevant aspects of the issue.<sup>170</sup> EPA must respond to the court's order and, during its revision of the standards, it must consider the climate change effects of particulate matter. Similarly, a pending lawsuit challenges the national air quality standards set for tropospheric ozone as insufficient to protect public welfare.<sup>171</sup> Depending on the outcome of that legal action, EPA may have to reconsider how ozone impacts global warming.

These legal challenges may change the regulatory landscape for EPA, and EPA must keep them in mind, along with the pending petitions and the Supreme Court ruling, when analyzing its regulatory obligations and options.

A chain reaction of regulatory obligations is embedded into the structure of the Clean Air Act: a single spark will set it off. In *Massachusetts v. EPA*, the Supreme Court handed EPA a match, and soon—once EPA finalizes its endangerment finding—the match will be lit. Other pending petitions and court orders will add fuel to the fire. Yet by anticipating the blaze, EPA and Congress might be able to work together and minimize some of the more inefficient potentials of the inevitable chain reaction. The next two chapters try to predict EPA's obligations under the Clean Air Act.

# Chapter Two

## Mobile Source Obligations

This Chapter will build on the holdings of *Massachusetts v. EPA*, as explained in Chapter One, and will analyze EPA's obligations to regulate GHG emissions from mobile sources under the CAA.

On April 17, 2009, EPA Administrator Lisa Jackson signed a proposed endangerment finding for GHG emissions from motor vehicles. In Sections A and B, this Chapter explains how EPA will be obligated to finalize the findings in that proposal. Section A will conclude that EPA must eventually classify all six main GHGs (carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride) as air pollutants, either individually or as a single class. Section B will conclude that EPA must, at a minimum, issue a finding that the four GHGs emitted by new motor vehicles (carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons) contribute to pollution that endangers public health and welfare. Once EPA's proposed endangerment finding is finalized, EPA must issue GHG emissions standards for new motor vehicles.

The scope of EPA's first endangerment finding will be vitally important for determining which other sections of the CAA are automatically triggered, as GHG emissions from other mobile sources also contribute to global warming and are just as harmful to public health and general welfare. The remainder of this Chapter will discuss EPA's obligations when it comes to these other mobile sources. Section C will explain that, due to filed public petitions, EPA will be required to issue a positive finding that GHG emissions from aircraft engines contribute to pollution that endangers public health and welfare. Once this finding is made, EPA is statutorily obligated to issue emissions standards for aircraft engines. Section D will conclude that, also due to filed public petitions, EPA will be required to issue positive endangerment findings for GHG emissions from marine vessels and other nonroad vehicles. EPA is statutorily obligated to issue regulations for these sources unless it can articulate a reason to exercise its discretion not to regulate.

Finally, Section E will explain that the existence of petitions to regulate fuels used in marine vessels constrains EPA discretion in the area of vehicle fuels. EPA will be automatically on course to issue a positive finding that GHG emissions from marine fuels contribute to the GHG pollution that

endangers public health and welfare. Before acting to regulate marine fuels, EPA should consider whether regulating all fuels may be more advantageous.

## **A. Classification of Greenhouse Gases as “Air Pollutants”**

The petition at the heart of *Massachusetts v. EPA* only addressed the four GHGs emitted from motor vehicles (carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons). Therefore, the Supreme Court’s holding on the breadth of the definition of “air pollutant” automatically applies to those four GHGs.<sup>172</sup> However, the Supreme Court spoke in much more general language. The Court held that Congress defined “air pollutant” under the Clean Air Act in deliberately “sweeping” and “unambiguous” terms that included *any* physical or chemical substance emitted into the ambient air.<sup>173</sup> Thus, even the two major GHGs not emitted by motor vehicles (perfluorocarbons and sulfur hexafluoride) clearly fall within that definition.

The CAA typically requires EPA to determine whether an air pollutant emitted by a specific source contributes significantly to dangerous “air pollution.” To clarify, “air pollution” refers to the “total, cumulative stock in the atmosphere” of these gases; whereas “air pollutants” are the emissions whose “flow changes the size of the total stock.”<sup>174</sup>

EPA’s proposed endangerment finding defines the elevated concentrations of all six main GHGs as a type of “air pollution,” and makes an endangerment finding for that entire class of pollutants.<sup>175</sup> EPA is then left with two options: define all six GHGs either together as a single “air pollutant” or separately as six individual “air pollutants.” The first option—which is the tactic EPA prefers in its proposed endangerment finding<sup>176</sup>—takes into account the cumulative effects of the major greenhouse gases and would enable a more coordinated approach in addressing multiple emissions from a single source.<sup>177</sup>

The Supreme Court’s sweeping definition of “air pollutant” will compel EPA to classify all six GHGs, either individually or collectively, as air pollutants. EPA is already moving in that direction with its April 2009 proposal.

Simply classifying a gas, or gases, as an air pollutant, however, does not mandate that EPA must issue regulations or even that EPA must make an endangerment finding for that pollutant. The rest of this chapter explores these remaining questions for mobile sources.

## **B. New Motor Vehicle Emissions**

The holding in *Massachusetts v. EPA* and the current state of science give EPA little wiggle room in making an endangerment finding for GHG emissions from motor vehicles. Cognizant of this reality, EPA has recently proposed such an endangerment finding.<sup>178</sup> Once that endangerment finding is made for an air pollutant, the language of Section 202(a)(1) mandates that EPA must regulate emissions of that air pollutant from new motor vehicles.

### **B.1. The Motor Vehicles Endangerment Finding**

In *Massachusetts v. EPA*, the Supreme Court made it clear that EPA has only three action options with respect to motor vehicle emissions of GHGs: (1) make a positive endangerment determination; (2) make a negative endangerment determination if science supports that greenhouse gases do not contribute to climate change; or (3) provide “a reasoned justification for declining to form a scientific judgment.”<sup>179</sup>

With regard to the third option, the Court clarified that any such justification must be grounded only in science: “The statutory question is whether sufficient information exists to make an endangerment finding.”<sup>180</sup> “If the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming, EPA must say so.”<sup>181</sup>

However, the Supreme Court itself noted that there is little remaining scientific debate about the gravity and cause of the looming climate change crisis. For example, the Court stated:

The harms associated with climate change are serious and well recognized. Indeed, the [National Research Council] Report itself—which EPA regards as an “objective and independent assessment of the relevant science”—identifies a number of environmental changes that have already inflicted significant harms, including “the global retreat of mountain glaciers, reduction in snow-cover extent, the earlier spring melting of rivers and lakes, [and] the accelerated rate of rise of sea levels during the 20th century relative to the past few thousand years.”<sup>182</sup>

Given the current state of climate change science, as acknowledged by the Supreme Court, it would be very difficult for EPA either to refuse to form an opinion, or to determine that GHGs do not contribute to climate change.

Section 202(a)(1) of the Clean Air Act spells out the requirements for an endangerment finding on pollution from new motor vehicles:

The Administrator *shall* by regulation prescribe . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.

The use of the word “shall” mandates regulation once the criteria are met. Broken down into distinct criteria, action under Section 202 requires:

- (1) the emission of any air pollutant (i.e., is the substance in question an “air pollutant?”);
- (2) from any class or classes of new motor vehicles or new motor vehicle engines (i.e., is it emitted by motor vehicles?);
- (3) which in his or her judgment causes, or contributes to, air pollution (i.e., do the emissions from automobiles add to the air pollution?); and
- (4) which may reasonably be anticipated to endanger public health or welfare (i.e., does the air pollution present a risk of endangerment?).

The Supreme Court has already held that the GHGs emitted from motor vehicles—carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons—are air pollutants. It is also clear that motor vehicles emit these GHGs.

There are only two findings under Section 202(a) left unanswered after *Massachusetts v. EPA*: whether the air pollution at issue may reasonably be anticipated to endanger public health or welfare (the endangerment test), and

As explained in EPA’s recently proposed endangerment finding:

References to *anticipation* and *endangerment* imply that to fail to look to the future or to less than certain risks would be to **abjure the Administrator’s statutory responsibilities**.

whether emissions from new motor vehicles or engines cause or contribute to that air pollution (the contribution test). Although distinct questions, they are commonly referred to collectively as “an endangerment finding.”

Both the endangerment and contribution tests are precautionary.<sup>183</sup> That is, EPA does not need to wait until harm has occurred, but instead must be ready to take regulatory action to prevent harm before it occurs. The Administrator must exercise reasonable judgment by weighing risks, assessing potential harms, and making reasonable projections of future trends and possibilities when making these determinations. In allowing for “judgment,” the CAA permits EPA to make reasonable projections, assessments, and estimates.<sup>184</sup> As EPA’s recently proposed endangerment finding notes, “the references to *anticipation* and to *endangerment* imply that to fail to look to the future or to less than certain risks would be to abjure the Administrator’s statutory responsibilities.”<sup>185</sup>

## **B.2. Motor Vehicles Endanger Public Health and Welfare**

EPA plans to define the term “air pollution” as the elevated and collective atmospheric concentrations of all six greenhouse pollutants. This GHG pollution is clearly “reasonably . . . anticipated” to endanger public welfare. The CAA defines effects on “public welfare” broadly as including:

[E]ffects on soils, water, crops, vegetation, man-made materials, animals, wildlife, weather, visibility, and *climate*, damage to and deterioration of property, and hazards to transportation, as well as effects on economic values and on personal comfort and well-being.<sup>186</sup>

The science of global warming and its effects on public health and welfare are widely accepted, as recognized by the Supreme Court.<sup>187</sup> GHG pollution leads to increased global average temperatures, and most of the United States is expected to experience an increase in average temperature.

Rising average temperatures are already affecting public welfare by shrinking glaciers, thawing permafrost, contributing to later freezing and earlier break-up of ice on rivers and lakes, lengthening growing seasons, shifting plant and animal ranges, and causing trees to flower earlier. Global warming is expected to inflict harm on water resources, rangelands and forests, non-tidal wetlands, fisheries, and bird populations. Global warming will also have effects on human welfare by harming food production, nutritional health, weather patterns, sea levels, and water quality and quantity.<sup>188</sup>

The CAA does not define public health. When analyzing another section of the CAA that uses this same term, the Supreme Court gave the term its most “natural,” and also tautological, meaning: “the health of the public.”<sup>189</sup> When considering public health under the CAA, EPA has looked at morbidity—such as impairment of lung function, aggravation of respiratory and cardiovascular disease, and other acute and chronic health effects—as well as mortality.<sup>190</sup>

There are two competing theories on the meaning of “public health effects.” The first theory interprets the term to only include health effects caused by *direct exposure* to the actual pollutant. This interpretation can be supported by legislative history.<sup>191</sup> The second theory interprets the term more broadly to include health effects that may be caused *indirectly* by a pollutant.

Only under the second interpretation can GHG emissions affect public health. As EPA has noted:

To be clear, ambient concentrations of carbon dioxide and the other greenhouse gases . . . do not cause direct adverse health effects such as respiratory or toxic effects. All public health risks and impacts . . . as a result of elevated atmospheric concentrations of greenhouse gases



occur via climate change. The pathway or mechanism occurs through changes in climate, but the end result is an adverse effect on the health of the population.<sup>192</sup>

Fluctuating temperatures caused by emissions of GHGs will increase the incidents of infectious diseases (such as malaria, dengue fever, encephalitis, and Hantavirus) and water-borne diseases (such as cholera, toxic algae, and cryptosporidiosis). Changing climate conditions will also increase, among others, the incidences of heat stress, skin cancer, respiratory disorders, cataracts, and immune suppression.<sup>193</sup>

In its proposed endangerment finding, EPA makes a judgment that these indirect effects are considered public health effects under the statute, and therefore GHGs endanger public health as well as public welfare.<sup>194</sup> If EPA proceeds with this endangerment finding for public health, it may limit EPA's options when utilizing other sections of the CAA, such as national ambient air quality standards, as discussed in Chapter Five.

Regardless of whether the finding is only for public welfare, or for both public welfare and health, the endangerment test will be satisfied under Section 202. The majority opinion in *Massachusetts v. EPA* reflects a solid acceptance of the near-unanimous scientific consensus that GHGs are causing significant harm to warrant an endangerment finding, and a court would view with suspicion any finding to the contrary.

Accordingly, EPA's proposal makes a finding that GHG pollution endangers both public health and welfare.<sup>195</sup> Given the state of science and the Supreme Court mandate, EPA will be required to finalize this finding, at least for public welfare.

### **B.3. Motor Vehicles Contribute to GHG Pollution**

The remaining question is whether GHG emissions from motor vehicles "contribute" to the pollution of those GHG gases. As noted, this is a precautionary standard and falls within the discretion of EPA's Administrator.<sup>196</sup> The use of the language "in [the Administrator's] judgment" in Section 202, which applies both to the contribution and endangerment finding, serves to "emphasize the necessarily judgmental element" involved in predicting risks and causation.<sup>197</sup>

The word "contribute" does not imply that the source has to be a large, major, or sole contributor to the air pollution, but only that it supplies part of the pollution. In *Bluewater Network v. EPA*, the D.C. Circuit Court of Appeals interpreted this word in the context of another CAA provision pertaining to mobile sources.<sup>198</sup>

The court looked at the "ordinary meaning" of the word in dictionary definitions, and held that "'contribute' means simply 'to have a share in any act or effect.'"<sup>199</sup> The court noted that "[s]tanding alone, the term has no inherent connotation as to the magnitude or importance of the relevant 'share' in the effect."<sup>200</sup>

Given direct Supreme Court precedent and the state of science, EPA must issue a positive endangerment finding and positive contribution finding for GHG emissions from motor vehicles. If EPA fails to finalize its proposed endangerment finding soon, it risks violating the Supreme Court's mandate.

In its proposed endangerment finding, EPA adds that "any finding of a 'contribution' requires some threshold to be met; a truly trivial or *de minimis* 'contribution' might not count as such."<sup>201</sup> The proposal also notes that a "logical starting point for any contribution analysis is a comparison of the emissions of the air pollutant from the [specific source] category to the total, global emissions of the six greenhouse gases."<sup>202</sup> The Administrator should consider "the totality of the circumstances (e.g.,

the air pollutant, the air pollution, the nature of the endangerment, the type of source category, the number of sources in the source category, and the number and type of other source categories that may emit the air pollutant).”<sup>203</sup>

Although there is no bright-line rule, EPA’s historic application is instructive. In the past, EPA has typically compared the percent of emissions from a regulated mobile source to the total mobile source emission for that air pollutant.<sup>204</sup> EPA has also looked at the percentage of emissions from the source in comparison to the total amount of air pollution in a specific regional area.<sup>205</sup> EPA has found sources responsible for as little as 9%, 4%, 3%, and 1.2% pollution to be “contributors.”<sup>206</sup>

Following this historical application of the test and the plain meaning of the word “contribute,” the Administrator can—and must—find that emissions from new motor vehicles contribute to GHG pollution. Motor vehicles in the United States emit 24% of total U.S. GHG emissions and 4.3% of the world’s GHG emissions; they are the second largest GHG-emitting sector in the U.S.<sup>207</sup> Even when each gas is viewed independently, motor vehicle emissions constitute 26% of total U.S. carbon dioxide emissions (6% of the world’s), 0.32% of U.S. methane emissions (0.03% of the world’s), 8% of U.S. nitrous oxide emissions (1% of the world’s), and 56% of U.S. hydrofluorocarbon emissions (18% of the world’s).<sup>208</sup> As explained above, while non-carbon dioxide GHGs are typically emitted in lower quantities, they have higher global warming potentials than carbon dioxide.<sup>209</sup>

Moreover, the Supreme Court, in *Massachusetts v. EPA*, found that the contribution of the U.S. transportation sector to worldwide greenhouse gas emissions, which is about 6% of the world’s greenhouse gas inventory, was by itself “enormous” and “a meaningful contribution to greenhouse gas concentrations.”<sup>210</sup> Judged by the standards of *Massachusetts v. EPA*, a source category such as motor vehicles that emits about 24% of total GHGs in the U.S. and 4% of the world’s GHGs should count as a contributor to the air pollution.

Given direct Supreme Court precedent and the state of science, EPA must issue a positive endangerment finding and positive contribution finding for GHG emissions from motor vehicles. EPA has already proposed a response with these two findings. If EPA fails to finalize that proposal (or something substantially similar to it), it risks violating the Supreme Court’s mandate. Fortunately, EPA appears to be poised to issue a final endangerment finding by the end of 2009.

#### **B.4. EPA Must Regulate Motor Vehicle Emissions**

Section 202 is nondiscretionary. Once EPA finalizes the endangerment finding for GHGs from motor vehicles, it must issue emissions standards for those GHGs from all motor vehicles (including cars, light trucks, heavy trucks, buses and motorcycles):

The Administrator *shall* by regulation prescribe . . . standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.

EPA must still address the question of the form of these standards. For example, EPA may wish to consider regulations other than direct limitations on GHG emissions from motor vehicles. EPA may also want to follow its historic practice of issuing distinct regulations for heavy-duty trucks and motorcycles, as the CAA offers such authority to distinguish between various categories of motor vehicles.<sup>211</sup> The regulatory options that EPA could pursue within its discretion are evaluated in Part Two of this Report.

## C. Aircraft Emissions

There are currently three petitions pending before EPA on regulating GHG emissions from aircraft under section 231 of the CAA, the first filed by California in late 2007.<sup>212</sup> As discussed above, EPA must respond to these petitions in a reasonable time period and cannot delay making a determination in the face of convincing scientific evidence.

### **C.1. The Aircraft Endangerment Finding**

Section 231(a) provides broad authority for EPA to establish emission standards applicable to aircraft engines.<sup>213</sup> Section 231(a)(2)(A) contains language virtually identical to Section 202(a)(1):

The [EPA] Administrator *shall*, from time to time, issue proposed emission standards applicable to the emission of any air pollutant from any class or classes of aircraft engines which in his judgment causes or contributes to, air pollution which may reasonably be anticipated to endanger public health or welfare.

Like Section 202, this section is nondiscretionary due to the use of the word “shall”: once EPA makes an endangerment finding, it must issue emissions standards for GHGs from aircraft. EPA must also give appropriate lead time for regulated entities to come into compliance given the available technology and compliance costs.<sup>214</sup> States and other political subdivisions are prohibited from adopting or attempting to enforce any emissions standards for aircraft engines unless they are identical to standards promulgated by EPA.<sup>215</sup>

Since 1973, EPA has issued aircraft emissions regulations to control smoke, fuel venting, and emissions of traditional pollutants. EPA has usually adopted the standards of the United Nations International Civil Aviation Organization; EPA’s regulations have often been voluntary or set at emissions levels already achieved by most aircraft.<sup>216</sup> EPA does not directly enforce its standards regulating aircraft engines, but rather the Federal Aviation Administration (FAA) is required to prescribe regulations to ensure compliance with EPA’s standards.<sup>217</sup>

There are two key differences between Sections 202 and 231.<sup>218</sup> First, section 231 applies specifically to aircraft engines, not aircraft, and it applies to both new and existing aircraft engines.<sup>219</sup> Second, section 231 states EPA must issue standards “from time to time.” The words “from time to time” potentially give the Administrator discretion over when to issue emission standards, even if an endangerment finding is made. However, as three pending petitions request EPA regulation of aircraft engines, EPA must respond in a reasonable time and manner. Given the clear state of science, it may be arbitrary and capricious for EPA to refuse to make an endangerment finding or to refuse to regulate aircraft engines. The administrative law principle of “reasonableness” limits any discretion given to EPA by the phrase “from time to time.”<sup>220</sup>

Thus, under Section 231, once the following criteria are met, EPA must propose emissions standards for aircraft engines for:

- (1) the emission of any air pollutant (i.e., is the substance in question an “air pollutant?”);
- (2) from any class or classes of aircraft engines (i.e., is it emitted by aircraft engines?);
- (3) which in his or her judgment causes, or contributes to, air pollution (i.e., do the emissions from aircraft engines constitute a share of the air pollution?); and
- (4) which may reasonably be anticipated to endanger public health or welfare (i.e., does the air pollution present a risk of endangerment?)

The threshold question is which of the above determinations will flow automatically from *Massachusetts v. EPA* and EPA's proposed endangerment finding for motor vehicles. As discussed in Section B, criterion one is met by the Supreme Court opinion, and criterion four is met by EPA's proposed endangerment finding. Further, it is abundantly clear that aircraft engines emit greenhouse gases, as aircraft engine emissions are approximately 70% carbon dioxide.<sup>221</sup>

## **C.2. Aircraft Contribute to GHG Pollution**

The only question remaining is whether aircraft emissions “contribute” to the air pollution. The answer is clearly yes. As explained above, a contribution finding requires that the emissions have a share in the effect on the public health and welfare, and does not require any determination of magnitude.

In 2007, aircraft contributed approximately 3% of the United States' total GHG emissions, and 10% of the U.S. transportation sector's GHG emissions—mainly in the form of carbon dioxide.<sup>222</sup> Additionally, while aircraft emissions per passenger mile have declined over time, total emissions have increased due to growth in air travel.<sup>223</sup> Accordingly, GHG emissions from aircraft are expected to increase 60% over current levels by 2025.<sup>224</sup>

Taking into consideration the meaning of “contribute” and the Supreme Court's finding in *Massachusetts v. EPA* that the contribution of the U.S. transportation sector to worldwide greenhouse gas emissions (about 6%) was an “enormous” contribution to GHG concentrations,<sup>225</sup> a source category that emits 10% of the U.S. transportation sector's GHGs will be considered a contributor to that air pollution.

Thus, all conditions for regulating GHG emissions from aircraft have been satisfied by Supreme Court precedent and EPA's proposed Section 202 endangerment finding. Given the existence of pending petitions, EPA must issue an endangerment finding and act to regulate aircraft engine emissions. The potential form of EPA's emissions standards for aircraft engines is discussed in Chapter Six.

## **D. New Nonroad Emissions**

There are currently five petitions pending before EPA requesting regulation of nonroad vehicles and engines, including marine vessels. The earliest of these was filed by California in October 2007.<sup>226</sup> EPA must respond to these petitions in a reasonable manner.

### **D.1. The Nonroad Vehicles Endangerment Finding**

Section 213 of the CAA provides EPA with broad authority to regulate emissions from new nonroad vehicles and engines—which include marine vessels, locomotives, and other nonroad vehicles (such as construction equipment, farm tractors, forklifts, harbor crafts, and lawn and garden equipment).<sup>227</sup> Sections 213(a)(2) and (3) specifically cover emissions of carbon monoxide, nitrogen oxides, and volatile organic compounds<sup>228</sup> from nonroad vehicles.<sup>229</sup> Section 213(a)(4) then provides:

If the Administrator determines that any emissions not referred to in paragraph (2) from new nonroad engines or vehicles *significantly* contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, the Administrator *may* promulgate (and from time to time revise) such regulations *as the Administrator deems appropriate* containing standards applicable to emissions from those classes or categories

of new nonroad engines and new nonroad vehicles (other than locomotives or engines used in locomotives) which in the Administrator's judgment cause, or contribute to, such air pollution . . . .

These regulations shall apply to the "useful life of the engines or vehicles," and EPA is directed to take into consideration costs, noise, safety, energy, and available technology when issuing standards.<sup>230</sup> EPA must also set appropriate lead times for regulations, taking into consideration technology, costs, safety and energy.<sup>231</sup> This section has a preemption and waiver requirement similar to Section 202.<sup>232</sup>

The broad source category of nonroad vehicles includes many subclasses. Therefore, EPA usually regulates sub-classes of nonroad vehicles under this section as opposed to regulating the entire category of nonroad vehicles. For example, EPA has promulgated limitations covering only emissions from marine engines,<sup>233</sup> or standards only for large spark-ignition engines and land-based recreational engines.<sup>234</sup>

There are two key differences between Section 213 and Section 202. First, the endangerment finding requires a determination that the emissions from those sources "*significantly* contribute" to the air pollution. Second, even if EPA makes a positive endangerment and contribution finding, the act of setting standard is discretionary—as noted by the use of the word "may." Additionally, even if EPA chooses to set standards, it has wide latitude to issue "regulations *as the Administrator deems appropriate* containing standards applicable to emissions" from these sources.

That is, under Section 213(a)(4), EPA may set standards for emissions from new nonroad vehicles and engines for:

1. any emissions not referred to in paragraph (2) (i.e., is the substance in question an air pollutant<sup>235</sup> other than carbon monoxide, nitrogen oxide, or a volatile organic compound?);
2. from new nonroad engines or vehicles (i.e., is it emitted by new nonroad engines or vehicles?);
3. which EPA determines, in the aggregate, significantly contribute to air pollution (i.e., do the nonroad emissions make up a share of the air pollution?); and
4. which may reasonably be anticipated to endanger public health or welfare (i.e., does the air pollution present a risk of endangerment?).

Pending petitions for marine vessels will constrain EPA's discretion. EPA must make endangerment and contribution findings and issue regulations **unless it can articulate a reason not to regulate marine emissions.**

As discussed previously, criteria one, two, and four will be met by the Supreme Court standard and EPA's Section 202 endangerment finding. The six GHGs, either as a whole or individually, will be considered an air pollutant(s), and GHGs are not among those pollutants listed in the previous section. And, EPA will have already found that GHGs are reasonably anticipated to endanger public health or welfare. The main finding left unanswered under Section 213 is the contribution finding, which is explored below.

## **D.2. Nonroad Vehicles Significantly Contribute to GHG Pollution**

Notably, when EPA regulates only certain categories of nonroad vehicles, Section 213 does not require that EPA make a finding that the specific category of nonroad vehicles *significantly* contributes to the air pollution.<sup>236</sup> Rather, it asks a two part question: first, do new nonroad vehicles and engines as a whole significantly contribute to the air pollution (in this case, the pollution of GHGs that cause global warming); and, second, does the particular subclass EPA seeks to regulate contribute to the overall contribution of new nonroad engines and vehicles emission?<sup>237</sup>

Section 213 provides no guidance as to what constitutes a “significant” contribution. However, as EPA has noted, “guidance can be found in the legislative history and the scope of the CAA [Amendments], the emission contribution of nonroad engines and vehicles, and a comparison of nonroad emissions to emissions from other regulated sources.”<sup>238</sup> As an example of what Congress had in mind as “significant,” the Senate’s report accompanying the revised version of Section 213 in the 1990 CAA Amendments notes that “[e]missions inventories from EPA estimate that farm and construction equipment emit 3.7 percent of CO nationwide, four percent of nationwide NO<sub>x</sub> [nitrogen oxide], and 1.3 percent of total hydrocarbons . . . And a preliminary study prepared for EPA by the Radian Corporation estimates that NO<sub>x</sub> emissions from nonroad diesel engines make up over 12 percent of total NO<sub>x</sub> emissions nationwide, including four percent from diesel locomotives.”<sup>239</sup>

These figures provide an indication of the percentage of air pollution nonroad vehicles and engines must contribute to air pollution in order for them to be considered significant contributors under Section 213. Further, EPA itself has previously determined that nonroad sources emitting as little as 3% and 1.2% of the transportation sector’s emissions of a pollutant, or nationwide concentrations of the pollution, are sufficient to meet the significant contribution standard.<sup>240</sup>

Nonroad vehicles clearly emit GHGs; of the GHGs those application emit, almost 97% are carbon dioxide, 3% are HFCs (mainly from refrigerated transport), and 0.2% are methane and nitrous oxide.<sup>241</sup> All nonroad vehicles and engines together emit about 16% of the total mobile source GHG emissions in the United States, and those emissions are expected to increase by 46% from 2006 and 2030.<sup>242</sup> Taking into consideration EPA’s previous determinations and the standards of *Massachusetts v. EPA*, a source category that emits about 16% of the U.S. transportation sector’s “enormous” emissions should be found to be a “significant” contributor.

Because the second part of the contribution test is specific to the particular subclass EPA seeks to regulate (i.e. whether the particular subclass contributes to the overall contribution of nonroad engines and vehicles emission), it is addressed below for each subclass of nonroad vehicles.

### **New Marine Vessels Contribute to GHG Pollution**

First, EPA has been petitioned to regulate GHG emissions from marine vessels and engines—a specific subclass of nonroad vehicles and engines.<sup>243</sup>

Marine vessels clearly emit greenhouse gases. GHG emissions from marine vessels are, on average, 94% carbon dioxide, almost 5% HFCs, and about 1% methane and nitrous oxide.<sup>244</sup> Marine vessels contribute 5% of the total U.S. mobile source GHG emissions, and their emissions are expected to double between 2006 and 2030.<sup>245</sup> They are responsible for moving 80% of goods shipped into and out of the United States, and a single container ship emits more pollution than 2,000 diesel trucks.<sup>246</sup> And while the environmental impacts of ocean-crossing vessels clearly have international implications, these emissions are not regulated by any international treaty.

GHG emissions from marine vessels clearly constitute an important share of nonroad vessels' GHG emissions as a whole. In fact, GHG emissions from marine vessels would probably be considered a significant contributor on their own.

The mere existence of some discretion on the part of EPA, suggested by the word “may,” does not dilute EPA’s obligation to follow statutory criteria and explain its decisions in reasoned terms.<sup>247</sup> EPA may be able to invoke policy options to defend a decision not to regulate even if it makes positive endangerment and contribution findings. But the Court’s language in *Massachusetts v. EPA* could be interpreted to reject policy considerations for refusing to regulate even when EPA is granted discretion. There, the Supreme Court held that EPA cannot use policy justifications for refusing to make an endangerment finding under Section 202—it does not speak to whether EPA could use policy justifications for refusing to regulate after it makes an endangerment finding. However, given that the CAA grants EPA a clear mandate to protect the country’s air quality, it will be difficult for EPA to articulate a reasoned justification for choosing not to regulate a source contributes to the endangerment of public health or welfare.

Thus, as a responsible regulator, EPA should respond to these petitions by making a positive endangerment and contribution finding and regulating GHG emissions from marine vessels unless it can offer a solid reason not to do so. EPA’s options to regulate are discussed in Chapter Six.

### **Other New Nonroad Vehicles Contribute to GHG Pollution**

There are two petitions requesting EPA to regulate emissions from new nonroad vehicles and engines other than aircraft, marine, and locomotives.<sup>248</sup>

This specific category of nonroad sources clearly emits GHGs: they make up 8% of the U.S. transportation sector’s GHG emissions, mainly in the form of carbon dioxide.<sup>249</sup> Emissions from “non-transportation” mobile sources, only a part of this class, constitute the majority of nonroad GHG emissions. These sources include vehicles used outside of traditional road

The mere existence of some discretion—suggested by the word “may”—does not dilute EPA’s obligation to follow statutory criteria and explain its decisions in reasoned terms. Given EPA’s clear mandate to protect the country’s air quality, EPA **may be unable to articulate a justification for choosing not to regulate a source of dangerous pollution.**

systems and have utility associated with their movement but do not have the primary purpose of transporting people—such as snowmobiles, riding lawn mowers, agricultural equipment, and trucks used for off-road purposes.<sup>250</sup> Their total emissions exceed those of aircraft, and they emit more GHGs than marine vessels, locomotives, and pipelines combined. Emissions from non-transportation mobile sources are rapidly increasing—by almost 51% between 1990 and 2007, a significantly higher rate than for other mobile sources over the same period.<sup>251</sup> Viewed in light of EPA’s previous contribution findings, these percentages should satisfy a finding that nonroad vehicles (other than marine and locomotives) contribute to GHG pollution.

As with marine vessels, because of the pending petition, EPA can only avoid regulating these other nonroad vehicles if it can offer a solid justification. However, unlike for marine vessels, EPA may have a very good reason to refrain from regulating these sources, as explained in Chapter Six.

### **D.3. New Locomotives and Engines**

Locomotives (i.e. rail vehicles) are regulated under a separate subsection of Section 213. Subsection (a)(5) provides:

Within 5 years after the enactment of the Clean Air Act Amendments of 1990, the Administrator shall promulgate regulations containing standards applicable to emissions from new locomotives and new engines used in locomotives.

EPA must issue these standards to “achieve the greatest degree of emission reduction achievable” given available technology, while giving appropriate consideration to cost and time.<sup>252</sup> EPA is then directed to modify these standards “as the Administrator deems appropriate.”<sup>253</sup> EPA has updated standards applicable to locomotives, including adding new regulations.<sup>254</sup>

Notably, modification to locomotives standards does not require that EPA first make an endangerment and contribution finding. That is, EPA can decide to modify without determining whether the contribution of locomotive emissions to air pollution may endanger public health or welfare. Any previously issued endangerment findings will therefore not affect EPA’s discretion to regulate locomotive vehicles. The decision to add new standards is wholly within the Administrator’s discretion.

What may restrict EPA’s discretion is the filing of a petition to regulate GHG emissions from locomotives.<sup>255</sup> If a petition were filed, EPA may need to articulate a justifiable reason if it chooses not to regulate GHG emissions from locomotives. If EPA decides to issue regulations, in response to a petition or on its own, its options are discussed in Chapter Six.

## **E. Vehicle Fuels and Additives**

As explained in Chapter One, there is at least one petition requesting EPA issue regulations for fuels used in marine vessels. This petition, however, is specific to marine fuels; it does not request EPA to regulate all vehicle fuels.

Section 211 authorizes regulation of fuels and fuel additives used in motor vehicles and nonroad vehicles (excluding aircraft fuel). Sections 211(a) and (b) allow EPA to create and maintain a registration system for fuels and additives.<sup>256</sup> Section 211(c) then provides:

The Administrator *may*, from time to time on the basis of information obtained [from registration requirements] or other information available to him, by regulation, *control or prohibit the manufacture, introduction into commerce, offering for sale, or sale* of any fuel or fuel additive for use in a motor vehicle, motor vehicle engine, or nonroad engine or nonroad vehicle if, in the judgment of the Administrator, any fuel or fuel additive or any emission product of such fuel or fuel additive causes, or contributes, to air pollution . . . that may reasonably be anticipated to endanger the public health or welfare.<sup>257</sup>

EPA can set such standards only after considering “all relevant medical and scientific evidence available . . . including consideration of other technologically or economically feasible means of achieving emission standards under section [202].”<sup>258</sup> The CAA preempts states from issuing such regulations; however, any state granted a waiver to issue motor vehicle regulations under Section 202 may issue regulations controlling fuel used in motor vehicles.<sup>259</sup>

Typically EPA has acted through section 211(c) to prohibit the use of certain additives (e.g., lead) in fuel, to control the level of a component of fuel to reduce harmful vehicle emissions (e.g., sulfur, benzene), or to place limits on tailpipe emissions of a pollutant (e.g., the reformulated gasoline standards for volatile organic compounds and toxic emissions performance).<sup>260</sup>



Similar to other CAA mobile source provisions, this section involves an endangerment finding that includes considering the contribution to air pollution made by the fuel or fuel additive. And like the section covering nonroad sources, EPA has discretion in deciding whether or not to issue regulations even if it makes positive endangerment and contribution findings.<sup>261</sup>

However, in striking contrast to other mobile source provisions, section 211 grants EPA extremely broad authority if it decide to regulate. It allows EPA to do more than just set emissions standards; instead, it allows EPA to “control” and “prohibit” the manufacture—including importing or refining—or sale of fuel.

In the aftermath of *Massachusetts v. EPA*, EPA will be required to make a positive endangerment and contribution finding for GHG emissions from vehicle fuels if petitioned to do so. GHG emissions from vehicles are directly proportional to fuel consumption, and GHG emissions from motor vehicles and nonroad vehicles are primarily emitted by use of particular fuels in those vehicles. In fact, petroleum accounts for 99% of mobile sources’ energy use and GHG emissions.<sup>262</sup>

As such, the contribution analysis for any vehicle fuel that emits GHGs during combustion will end in the same conclusion as the contribution analysis for the vehicles that use that fuel.

There appear to be no petitions requesting the complete regulation of the sale of all fuels used in motor and nonroad vehicles. However, Earthjustice has petitioned EPA to regulate the manufacture and sale of fuels used in marine vessels under section 211.<sup>263</sup> Marine vessels use mostly “residual fuels”—fuels left over after gasoline and other refined fuels are removed. These fuels are cheap but high in sulfur content, and their use emits larger amounts of GHGs. Because combustion of fuel is the primary method by which GHGs are emitted from marine vessels, the contribution analysis for marine fuels will be identical to the contribution analysis for marine vessels and engines, as described in section D, concluding in a positive endangerment finding. Additionally, because *all* mobile sources emit GHGs primarily through combustion of fuel, if EPA were petitioned to regulate any type of fuel that emits GHGs upon combustion, EPA will be required to make a positive contribution finding for that type of fuel.

Once this endangerment finding is made, EPA’s discretion to regulate marine fuels will be limited in the same way that its discretion is limited to regulate marine vessels. EPA must regulate unless it can articulate a justifiable reason to refrain from regulation. Without such a reason, a responsible regulator should issue standards controlling the manufacture and sale of marine fuel.

However, before acting, EPA should consider whether regulating all fuels—including gasoline, diesel, renewable, alternative and synthetic fuels, etc.—or regulating petroleum may be more advantageous than only regulating fuel used in one specific transportation source category.<sup>264</sup> As petroleum accounts for 99% of the energy use and GHG emissions in the transportation sector, regulating petroleum, petroleum-based fuels, or all fuels would achieve substantial reductions in GHG emissions from the transportation sector.

Given the Supreme Court’s decision and multiple pending public petitions to regulate, once EPA finalizes its proposed endangerment finding, it will be on an automatic course to make endangerment findings under the remaining sections of Title II. These other sources also contribute to global warming and are just as harmful to the public, and EPA will be locked into a path that ends in the regulation of most mobile sources.

# Chapter Three

## Stationary Source Obligations

A stationary source is, simply put, any source of pollution that is not mobile.<sup>265</sup> The category encompasses a wide range of buildings, structures, equipment, and installations,<sup>266</sup> from the largest power plants and manufacturers to the smallest residential natural gas appliances.

Title I of the Clean Air Act recognizes two general types of stationary source air pollution: criteria pollutants and hazardous pollutants.<sup>267</sup> Criteria pollutants are emitted in great quantities and cause problems across broad regions of the country; only a few pollutants have qualified as criteria pollutants. The Act requires EPA to set air quality targets for these pollutants, known as “National Ambient Air Quality Standards” (or “NAAQS”). The statute primarily relies on the individual states to achieve and maintain the standards within their own borders, authorizing general use of a host of regulatory tools and requiring specific controls for new and modified sources under the “New Source Review” program (“NSR”). However, the CAA does instruct EPA to supplement these efforts by targeting certain categories of polluters and applying national standards to their emissions. Called “New Source Performance Standards” (“NSPS”), these additional emissions restrictions can also be applied to existing sources in some limited situations.

In contrast to criteria pollutants, hazardous air pollutants are highly toxic even in small quantities; hundreds of pollutants qualify as hazardous air pollutants, and EPA is instructed to set stringent controls for both new and existing stationary sources of such pollutants. Other provisions scattered throughout the CAA target a few more specific pollutants and more specific stationary sources.<sup>268</sup> Of particular importance, Title VI of the CAA gives EPA broad authority to regulate any pollutant that threatens the earth’s stratosphere, especially the ozone layer.

This chapter explores which requirements for stationary sources will become mandatory in light of the Supreme Court’s ruling in *Massachusetts v. EPA* and the mobile source determinations discussed above. EPA will be able to exercise its discretion to avoid applying certain stationary source regulations to GHG emissions, but a few significant requirements—particularly with respect to new stationary sources—will become mandatory.

Section A analyzes EPA's discretion on whether to list greenhouse gases as criteria pollutants and prescribe national ambient air quality standards for them. Though legal precedent suggests EPA must regulate all GHGs as criteria pollutants, the relevant court case predates significant structural amendments to the CAA. EPA must be mindful of case law, but the agency can advance an argument for discretion. EPA must also consider climate effects when revising NAAQS for certain already-listed criteria pollutants that have global warming potentials.

Section B discusses when New Source Review requirements might apply to GHGs, even if they are not classified as criteria pollutants. EPA must eventually list GHGs as "regulated pollutants," which will trigger a requirement for all new and modified major sources to install the best available control technology for their GHG emissions. EPA must also treat GHG sources as "major emitting facilities," meaning that a variety of relatively small sources of pollution will now require preconstruction permits. Finally, EPA must consider the environmental costs of climate change whenever issuing a permit under the New Source Review program.

Section C reviews New Source Performance Standards. EPA need not include any particular new category of greenhouse gas sources on its list of regulated categories, but it must consider additions in a reasonable time and manner. EPA must also review greenhouse gas emissions when revising standards for already-listed source categories. Finally, EPA must make reasonable progress through that review process, and the agency must respond to pending petitions in a reasonable time and manner.

Section D concludes that EPA has discretion to choose not to list GHGs as hazardous air pollutants. Section E then concludes that, under Title V, EPA will be required to institute permitting requirements for any major stationary source.

Finally, Section F examines the control of stratospheric pollutants under Title VI. Regulation of GHGs under Title VI will be mandatory if scientific findings support that GHGs affect the stratosphere. However, no scientific consensus on this issue has emerged yet.

## **A. National Ambient Air Quality Standards**

National ambient air quality standards (NAAQS) provide EPA with its most comprehensive authority for controlling air pollution under the Clean Air Act. Through this regime, EPA can target any dangerous pollutant emitted by numerous or diverse sources.<sup>269</sup> EPA issues "criteria" detailing the effects of such a pollutant on public health and welfare (hence the term "criteria pollutant").<sup>270</sup> Based on those criteria, EPA then sets national ambient air quality standards at the levels necessary to protect public health (primary standards) and public welfare (secondary standards).<sup>271</sup> States have the principal responsibility for developing implementation plans to achieve and maintain such standards.<sup>272</sup> Currently, EPA regulates six criteria pollutants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead.<sup>273</sup> Two of those pollutants—ozone and particulate matter—have climate implications, which EPA must eventually address.<sup>274</sup>

Whether EPA must also list GHGs as "criteria pollutants" depends on statutory interpretation. The statutory language outlining when EPA must list criteria pollutants is ambiguous, and the relevant court case interpreting the provision is over thirty years old. There, the court ruled that listing criteria pollutants is a non-discretionary duty, and that holding remains good law. However, since that case was decided, the Clean Air Act has been amended significantly on two separate occasions. Furthermore, the case predated the rise of *Chevron*-type deference to an agency's statutory interpretations of ambiguous language. Therefore, while EPA must be mindful of the legal precedent, the agency can advance a persuasive argument for discretion.

### **A.1. The NAAQS Endangerment Finding**

EPA must issue NAAQS for greenhouse gases if they qualify as “criteria pollutants.”<sup>275</sup> Section 108(a)(1) of the CAA defines the requirements for listing criteria pollutants:

For the purposes of establishing national primary and secondary ambient air pollutant standards, the Administrator shall within 30 days after the date of enactment of the Clean Air Amendments of 1970 publish, and shall from time to time thereafter revise, a list which includes each air pollutant—(A) emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; (B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources; and (C) for which air quality criteria had not been issued before the date of enactment of the Clean Air Amendments of 1970, but for which he plans to issue air quality criteria under this section.

The essence of the determination is an endangerment finding, similar to the endangerment finding required for motor vehicles under Section 202.<sup>276</sup> Of course, EPA can voluntarily undertake an endangerment finding for any greenhouse gas under Section 108. However, statutory language and precedent could dictate that certain greenhouse gases are automatically listed as criteria pollutants.

Certain requirements for listing criteria pollutants will flow automatically from the Supreme Court ruling in *Massachusetts v. EPA* and from any endangerment finding made previously under Section 202. Specifically, Section 108(a)(1) stipulates that EPA must begin the regulatory process:

- for listed “air pollutant[s].” *Massachusetts v. EPA* held that the Clean Air Act’s definition of “air pollutant” is a “sweeping” one that “unambiguous[ly]” includes carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons.<sup>277</sup> As discussed above, perfluorocarbons and sulfur hexafluoride will also qualify as “air pollutants.”<sup>278</sup>
- for pollutants that cause or contribute to dangerous air pollution. Unlike the source-specific endangerment finding under Section 202 (which asked specifically whether *motor vehicle* emissions contributed to dangerous pollution), Section 108 separates the question of endangerment (subsection A) from the question of source (subsection B). In short, if *any* emissions of the air pollutant contribute to dangerous pollution, subsection A is satisfied. Since a Section 202 endangerment finding will have already determined that motor vehicle emissions of greenhouse gases present a danger, Section 108(a)(1)(A) is automatically satisfied for at least carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons (and probably for other GHGs given the scope of EPA’s proposed endangerment finding).<sup>279</sup>
- for pollutants present in the ambient air. Presence in the ambient air is part of the CAA’s definition of “air pollutant,” and the Supreme Court found the definition makes no distinctions between various atmospheric levels.<sup>280</sup> Greenhouse gases qualify.
- for pollutants resulting from “numerous or diverse mobile or stationary sources.” There is no clear definition of either “numerous” or “diverse,” but certainly the millions of cars, trucks, motorcycles, and buses that a Section 202 endangerment finding will inevitably cover should qualify as “numerous mobile sources.”<sup>281</sup> Thus, precedent automatically satisfies section 108(a)(1)(B).
- if air quality criteria were not issued for the pollutant before 1970. As the lawsuit settled in *Massachusetts v. EPA* clearly demonstrated, air quality criteria have never been set for greenhouse gases.

Through this point of the analysis, all conditions for listing at least carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons as criteria pollutants have been automatically satisfied by precedent

from the Supreme Court ruling and the Section 202 endangerment finding. Thus, whether greenhouse gas NAAQS are automatically triggered turns on the meaning of the final condition of Section 108(a)(1): the list is to include pollutants “for which [the Administrator] plans to issue air quality criteria under this section.” Whether that phrase grants EPA the discretion not to list otherwise qualifying pollutants is a fiercely debated issue, and no clear consensus has emerged.<sup>282</sup>

## **A.2. EPA May Have Discretion Not to List GHGs as Criteria Pollutants**

The seminal case interpreting the requirements of Section 108(a)(1), *Natural Resources Defense Council v. Train*, was decided over thirty years ago by the U.S. Court of Appeals for the Second Circuit.<sup>283</sup> In *Train*, the court held that, once all other conditions for listing lead as a criteria pollutant had been met, EPA could not decline to list lead by invoking the final phrase of Section 108(a)(1)(C). In other words, EPA cannot escape its statutory duty simply by claiming that it does not “plan[ ] to issue air quality criteria” for the pollutant in question. According to the court, the plain language, structure, and legislative history of the Clean Air Act dictated that conclusion.<sup>284</sup> *Train* still represents good case law, and a strict application of its holding would mandate the listing of all GHGs as criteria pollutants.

However, over the last three decades, the Clean Air Act has been amended significantly,<sup>285</sup> and new canons of statutory interpretation have evolved.<sup>286</sup> Moreover, adding GHGs as criteria pollutants would invoke slightly different statutory language than the terms analyzed in *Train*. *Train*’s holding, then, may be distinguishable in light of these developments.<sup>287</sup>

### **Plain Language Is Ambiguous on EPA’s Discretion**

The Second Circuit noted in *Train* that Section 108 states that EPA “shall . . . publish . . . a list.” If the phrase “for which he plans to issue air quality criteria” always gave EPA discretion not to list pollutants, “then the mandatory language of [Section] 108(a)(1)(A) would become mere surplusage.”<sup>288</sup> Instead, the phrase “for which he plans” should only apply to the limited list of pollutants that EPA had already determined, before 1970, endangered the public and were generated by multiple sources. The Second Circuit cited the district court opinion on this point; the district court in turn had cited the Senate Report on the Clean Air Act of 1970:

[Section] 108 requires the initial list to “include all those pollution agents which have, or can be expected to have, an adverse effect on health and welfare and which are emitted from widely distributed mobile and stationary sources, *and* all those for which air quality criteria are planned.”<sup>289</sup>

In short, the courts viewed Section 108 as creating two distinct tracks for becoming a criteria pollutant: (1) pollutants emitted by multiple sources that endanger the public must be listed as criteria pollutants, with no room for EPA discretion; and (2) pollutants for which, in 1970, EPA already planned to issue air quality criteria should also be listed as criteria pollutants.<sup>290</sup>

Ultimately, the Second Circuit acknowledged that “the literal language of [Section] 108(a)(1)(C) is somewhat ambiguous.”<sup>291</sup> The court did its best to resolve that ambiguity. But *Train* was decided in 1976, eight years before the Supreme

Nearly all conditions for listing GHGs as criteria pollutants are automatically satisfied by precedent from the Supreme Court ruling and the Section 202 endangerment finding.

Whether greenhouse gases must be listed as criteria pollutants turns on the meaning of the phrase “for which he plans to issue air quality criteria under this section.”

Court ruled on *Chevron v. NRDC*.<sup>292</sup> In that later case, the Court held that when faced with ambiguous statutory language, “the court does not simply impose its own construction on the statute”; rather, the court reviews whether the agency’s interpretation of the statute is “permissible” and “reasonable.”<sup>293</sup> While these principles of statutory interpretation already existed when the Second Circuit ruled in *Train*, the Supreme Court formalized and strengthened the principles in *Chevron*.<sup>294</sup> Given the deference afforded to agency interpretations of ambiguous statutes after *Chevron*, a court today might have come to a different conclusion than *Train* did regarding EPA discretion under Section 108(a)(1)(C).

Of course, that alone is not sufficient justification to erase *Train*’s holding from the books. On the other hand, *Train* is somewhat distinguishable from the present circumstances involving GHGs. The Second Circuit was interpreting Section 108(a)(1)(C) as it related to the language “shall publish,” a phrase which created an obligation to list within thirty days of enactment all pollutants that, in 1970, already satisfied the conditions of Section 108. Indeed, it was Congress’s intention and the court’s belief that EPA should have listed lead as a criteria pollutant thirty days after the 1970 Amendments were enacted.<sup>295</sup> The decision in *Train* did not discuss in depth the meaning of the phrase “shall from time to time thereafter revise.”<sup>296</sup> Since greenhouse gases can only be listed as criteria pollutants through such a revision, “shall publish” is not the relevant statutory language. While both phrases contain the typically mandatory command “shall,” the words “from time to time” do grant EPA at least some discretion on timing. A court today might be willing to reexamine how the ambiguous language of Section 108(a)(1)(C) interacts with the slightly more discretionary phrase “shall from time to time thereafter revise,” and could perhaps distinguish *Train* on such grounds. Indeed, legislative history and statutory structure support that—while *Train*’s holding remains unimpeachable on the non-discretionary duty to publish an initial list—agency discretion on subsequent decisions to add pollutants may in fact be consistent with a permissible and reasonable interpretation of the statute.<sup>297</sup>

### **Legislative History Does Not Foreclose EPA Discretion**

*Train* cited congressional reports to show that “the Congress expect[ed] criteria to be issued for” certain pollutants (including lead) within a precise timetable.<sup>298</sup> In other words, Congress thought Section 108 created mandatory obligations for listing criteria pollutants.<sup>299</sup> However, the same legislative history cited by the Second Circuit to prove the mandatory nature of the initial listings allowed much more flexibility on revising the list:

- “Others *may* be added to this group as knowledge increases”;
- “He *can* add to the list periodically”; and
- “If the Secretary subsequently should find that there are other pollution agents for which the ambient air quality standards procedure is *appropriate*, he *could* list those agents.”<sup>300</sup>

The legislative history does not clearly indicate that Congress intended additions to be mandatory.

### **Statutory Structure Has Substantially Changed Since Train**

Finally, *Train* points to the structure of the Clean Air Act to support its conclusions. If EPA always had discretion to list or not list criteria pollutants as it chose, what was the purpose of the rigid deadlines Congress created in the statutory procedures for setting NAAQS? The court felt that if EPA could simply choose not to list qualifying pollutants and to regulate them instead under some other provision of the Act, Congress would have attached similar deadlines to those other provisions. If the goal of the Clean Air Act was to reduce pollution, at least some provisions must be mandatory. In short, the court felt that the NAAQS structure was the primary and mandatory means for controlling pollution; other provisions were supplements to NAAQS, but they were not alternatives.<sup>301</sup>

However, the court's interpretation of statutory structure in 1976 may no longer apply after the 1977 Amendments to the Act. For example, in the Clean Air Act of 1970, New Source Performance Standards ("NSPS") were probably not intended as an alternative to NAAQS. In 1970, NSPS dealt with pollution contributing to the "endangerment of public health or welfare," whereas NAAQS originally focused on "adverse effect[s]."<sup>302</sup> Though the comparative rigor of those two standards is unclear, the courts were certain that they represented different standards.<sup>303</sup> The provisions were not interchangeable regulatory options, and the existence of one did not excuse the failure to comply with the mandatory obligations of another.

But in the 1977 Amendments, the standard for harm under NAAQS was changed to the more precautionary "endanger public health or welfare."<sup>304</sup> The standards for NAAQS and NSPS now matched. Yet, the statutory provisions for NSPS (Section 111) clearly still contemplate there will be some pollutants that endanger public health or welfare but are not listed as criteria pollutants.<sup>305</sup> Section 111(d) allows EPA to apply its New Source Performance Standards to existing sources "for any air pollutant . . . for which air quality criteria have not been issued or which is not included on a list published under section 108(a) [or 112(b)]."<sup>306</sup>

In fact, EPA has given such pollutants a name: "designated pollutants."<sup>307</sup> Examples of designated pollutants include sulfuric acid mist, fluorides, cadmium, and furans, as emitted by aluminum plants, paper mills, fertilizer plants, and solid waste incinerators.<sup>308</sup> Perhaps these pollutants simply are not emitted by enough "numerous or diverse" sources to qualify as criteria pollutants under Section 108(a)(1)(B).<sup>309</sup> Nevertheless, the potential for alternative options under the Act to regulate the same dangerous air pollutants renders inoperative the argument in *Train* that NAAQS must be obligatory because there is no alternative.<sup>310</sup>

Additionally, Congress created Section 122 in 1977 specifically to direct EPA on the "Listing of Certain Unregulated Pollutants":

(a) Not later than one year after date of enactment of this section . . . , the Administrator shall review all available relevant information and determine whether or not emissions of radioactive pollutants . . . cadmium, arsenic and polycyclic organic matter into the ambient air will cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health. *If the Administrator makes an affirmative determination* with respect to any such substance, *he shall* simultaneously with such determination include such substance in the list published under section 108(a)(1)...*or shall* include each category of stationary sources emitting such substance in significant amounts in the list published under section 111(b)(1)(A), *or take any combination* of such actions.

(b) Nothing in subsection (a) shall be construed to affect *the authority of the Administrator to revise any list referred to in subsection (a)* with respect to any substance (whether or not enumerated in subsection (a)).

This Section suggests two important conclusions. First, Congress directed EPA to undertake an endangerment finding for a specific list of pollutants, but otherwise did not change EPA's "authority" to revise the list of criteria pollutants. Second, even if EPA made a positive endangerment finding for these particular pollutants, the agency could choose whether to use NAAQS (under Section 108) *or* NSPS (under Section 111) *or* some combination of regulatory options. Section 122 recognizes not only that EPA has discretion to revise its list of criteria pollutants, but also that developing NAAQS is just one possible response EPA can take upon a positive endangerment finding.<sup>311</sup>

A final point relevant to statutory structure comes from Judge Tatel's dissenting opinion in the D.C. Circuit ruling on *Massachusetts v. EPA* (an opinion cited favorably by the Supreme Court on appeal).

Responding to EPA's argument that carbon dioxide should not be regulated under the Clean Air Act because applying NAAQS to the pollutant would be too difficult, Tatel said: "Even assuming that states' limited ability to meet CO<sub>2</sub> NAAQS renders these provisions unworkable as to CO<sub>2</sub>, the absurd-results canon would justify at most an exception limited to the particular unworkable provision, i.e., the NAAQS provision."<sup>312</sup> In other words, EPA could perhaps claim, under the "absurd results canon," an exception to any mandatory obligation to issue NAAQS for carbon dioxide if the resulting regulatory regime would prove too unworkable. To the extent NAAQS is difficult to apply to greenhouse gases,<sup>313</sup> this canon of statutory construction may provide EPA with additional justification for claiming discretion. However, because courts are typically reluctant to apply the absurd results canon,<sup>314</sup> exclusive reliance on this argument to justify EPA's discretion may not be wise.

### **A.3. Assuming Discretion under Section 108 Is Risky but Defensible**

In conclusion, *Train* still represents good case law, and a strict application of *Train*'s holding would require EPA to list GHGs as criteria pollutants. But given significant amendments to the Clean Air Act and the rise of *Chevron*-deference, *Train* may be distinguishable, and EPA may be able to assert discretion not to list otherwise qualifying criteria pollutants.

Still, the case for discretion is far from clear-cut, and any attempt not to list greenhouse gases as criteria pollutants could be subject to legal challenge. On the other hand, many of the parties most likely to challenge EPA's failure to regulate pollutants actually agree that listing GHGs as criteria pollutants may be undesirable.<sup>315</sup> Environmental groups mostly have adopted the position that EPA has deference not to list GHGs as criteria pollutants, since they want EPA to concentrate on more workable alternatives to regulate greenhouse gases under the Clean Air Act. In contrast, industry groups have asserted that EPA lacks any deference under Section 108, thereby demonstrating the parade of horrors that they believe will result from regulating greenhouse gases under the Clean Air Act; yet as the regulated party, industry is unlikely to bring suit to compel such regulation.

Ultimately, choosing not to issue NAAQS for greenhouse gases may be a risky strategy from both a legal and practical perspective. Moreover, such an action could create a dangerous precedent granting EPA too much discretion on listing other criteria pollutants in the future. A legislative fix to this potential problem may be necessary and appropriate if EPA does not wish to pursue NAAQS for greenhouse gases.

### **A.4. EPA Must Consider Climate Impacts of Existing Criteria Pollutants**

Of the six criteria pollutants EPA has already listed, two—particulate matter and ozone—may have effects on climate change. EPA cannot ignore such effects when revising air quality standards for those criteria pollutants. Notably, regulating these pollutants under NAAQS does not pose the same workability problems that many fear from the prospect of regulating more traditional GHGs under NAAQS: indeed, EPA has successfully applied NAAQS to particulate matter and ozone for many years.<sup>316</sup> Yet the air quality standards designed for these two criteria pollutants currently do not take into account their potential effects on climate change. EPA is under recent court order to revise its secondary NAAQS for particulate matter, and statutory requirements will eventually trigger a revision of the ozone standards. Such standards must be set at levels requisite to protect public health and welfare from the effects of climate change.



## Particulate Matter (Black Carbon)

EPA has regulated particulate matter as a criteria pollutant since 1971.<sup>317</sup> Particulate matter is a complex mixture of extremely tiny particles and liquids suspended in the air, including various acids and chemicals emitted from smokestacks, fires, and vehicle tailpipes. These fine particles are small enough to travel deep into human lungs; they can even slip directly into the bloodstream. The particles also affect visibility, corrode man-made materials, and harm vegetation through both physical and chemical processes.<sup>318</sup> EPA sets NAAQS for particulate matter to protect the public from these health and welfare effects.

A “major constituent” of particulate matter is elemental carbon or “black carbon,”<sup>319</sup> which results from the incomplete combustion of biomass and fossil fuels.<sup>320</sup> Black carbon is what gives soot its dark color. Principally, black carbon is produced by diesel engines for transportation or industrial use, residential solid fuels (coal and wood), open forest burning, and industrial processes (usually small boilers).<sup>321</sup> Black carbon is estimated to be the most significant single agent of global warming after carbon dioxide. Black carbon absorbs both direct solar radiation and reflected sunlight, and, when deposited onto sea ice and snow, it increases the solar absorption and melting of such ice and snow.<sup>322</sup> Though the United States only contributes 6.1% of global soot, the U.S. soot contribution to global warming may exceed that of either U.S. methane emissions or U.S. nitrous oxide emissions.<sup>323</sup>

Since black carbon is an aerosol (not a gas), has a relatively short lifespan (only days or weeks, compared to decades or centuries for other GHGs), and has many localized health effects, soot has not been part of the international debate on climate change.<sup>324</sup> Similarly, EPA currently does not include black carbon in its proposed endangerment finding for GHGs.<sup>325</sup> However, given the short lifespan of black carbon, targeting soot is arguably the best way to have a short-term effect on climate change: concentrations can be brought down quickly and will have a real-time effect on temperature. Moreover, “[d]espite soot regulations to date based on health grounds, the United States has significant room to reduce soot emissions further, thereby improving the length and quality of life and reducing the impacts of global warming.”<sup>326</sup>

Unfortunately, EPA has been hesitant thus far to consider climate change effects when setting the secondary NAAQS for particulate matter. Some particulate matter components

besides black carbon actually have a cooling effect on global temperatures, scattering solar radiation rather than absorbing it. EPA believes it lacks the quantitative data to determine the ultimate effect of particulate matter on solar radiation.<sup>327</sup> When EPA revised NAAQS for particulate matter in 2006, its staff recommendation was: “[T]here is insufficient information available to help inform consideration of whether any revisions of the current secondary [particulate matter] standards are appropriate at this time based on ambient [particulate matter’s] role in atmospheric processes related to climate or the transmission of solar radiation.”<sup>328</sup>

In February 2009, the D.C. Circuit Court of Appeals remanded to EPA its 2006 revision of secondary NAAQS for particulate matter. While the case did not discuss climate change, instead focusing on EPA’s failure to calculate a specific required level of visibility to protect public welfare, the court’s broader holding was that “EPA’s decision to set secondary [particulate matter] NAAQS identical to

EPA cannot ignore the effects of climate change when setting air quality standards. As the D.C. Circuit Court of Appeals recently explained:

An agency’s failure adequately to consider a relevant and significant aspect of a problem **may render its rulemaking arbitrary and capricious.**

the primary NAAQS was unreasonable and contrary to the requirements of [CAA § 109(b)(2)]. Accordingly, we grant the petition for review and remand for reconsideration the secondary NAAQS for [particulate matter].”<sup>329</sup>

In its ruling, the court called attention to an important principle of administrative law: “An agency’s failure adequately to consider a relevant and significant aspect of a problem may render its rulemaking arbitrary and capricious.”<sup>330</sup> When EPA reviews the secondary NAAQS for fine particulate matter in accordance with the court order, the agency cannot “fail[ ] adequately to consider [the] relevant and significant” issue of climate change.<sup>331</sup> In particular, despite EPA’s concern about the ability to distinguish warming particles from cooling particles, almost all particles emitted by diesel engines are of the warming kind; most cooling particles are sulfates from coal plants.<sup>332</sup> As the House of Representatives Committee on Oversight and Government Reform explored in a 2007 hearing, black carbon is distinguishable from other types of particulate matter and can be regulated by targeting specific sources like diesel engines.<sup>333</sup>

EPA must reissue secondary NAAQS for particulate matter in accordance with the D.C. Circuit court’s order of remand, and during the revision, the agency must consider how to set the secondary NAAQS to protect public welfare from climate effects.

### **Tropospheric Ozone**

Tropospheric ozone is another criteria pollutant with global warming implications. Ozone is mostly a secondary pollutant, generated from reactions involving volatile organic compounds, nitrogen oxides, and carbon monoxide, as emitted from various anthropogenic sources. While a layer of ozone in the earth’s stratosphere is crucial to protect the planet from harmful radiation, concentrations in the troposphere can present significant risks to human health and welfare. EPA began regulating photochemical oxidants and ozone (O<sub>3</sub>) in 1971 to protect the public from respiratory and cardiovascular health threats, ultraviolet and infrared radiation risks, and vegetative effects.<sup>334</sup>

Though ozone can be a potent greenhouse gas, the exact effects of ozone on climate change are complex and somewhat uncertain.<sup>335</sup> EPA revised its ozone NAAQS in 2008,<sup>336</sup> and the agency chose not to reflect potential climate impacts in the secondary NAAQS:

The overall body of scientific evidence suggests that high concentrations of O<sub>3</sub> on a regional scale could have a discernable influence on climate, leading to surface temperature and hydrological cycle changes. However, . . .confirming this effect will require further advances in monitoring and improvement in chemical transport and regional-scale modeling. Thus, [EPA] concludes that insufficient information is available at this time to quantitatively inform the secondary NAAQS process with regard to this aspect of the O<sub>3</sub>-climate interaction and will not address it further.<sup>337</sup>

EPA is not yet under any court order to revisit its ozone standards, and the agency is only statutorily required to review NAAQS every five years.<sup>338</sup> However, a coalition of states and environmental groups has recently sued EPA, arguing the ozone NAAQS were arbitrarily and capriciously set too leniently. In early 2009, EPA asked the D.C. Circuit to stay its schedule for the lawsuit to allow a six-month review of the standards.<sup>339</sup> While this review is purely voluntary, if EPA does undertake a review, it must do so in accordance with statutory requirements. Therefore, EPA must consider the potential climate impacts of ozone. Notably, the statute does not permit EPA to avoid setting NAAQS simply because it lacks a complete scientific understanding of the pollutant’s effects on health and welfare.<sup>340</sup>

## B. New Source Review (PSD and NNSR)

To help states achieve and maintain the national ambient air quality standards set for criteria pollutants, the Clean Air Act Amendments of 1977 formalized a process for preconstruction review and permitting of any new or modified major stationary source.<sup>341</sup> A “modified” source is one undertaking a physical or process change that results in increased emissions.<sup>342</sup> The review process, collectively known as New Source Review (NSR), consists of two separate programs: Prevention of Significant Deterioration and Non-Attainment New Source Review.

Prevention of Significant Deterioration (PSD) applies to areas of the country that have already achieved better air quality than required by NAAQS (so-called “attainment areas”), with the goal of preventing any degradation back down to the minimum standards set by NAAQS.<sup>343</sup> A main component of the PSD program—though certainly not the only requirement—is the preconstruction permit.<sup>344</sup> Before building a new major source or modifying an existing major source in a PSD area, a permit is necessary. To obtain that permit, the applicant must agree to use the best available control technology (BACT) not just for criteria pollutants, but for all regulated pollutants. Most PSD permits are issued by states under plans approved by EPA. EPA is the permitting authority on federal and tribal lands, as well as in a few states, local areas, and territories.<sup>345</sup>

Non-Attainment New Source Review (NNSR) applies to areas of the country that have exceeded NAAQS for a specific pollutant, with the goal of setting the area on track toward attainment. Before building a new major source or modifying an existing major source in a “non-attainment area,” a permit is necessary. A source may need both NNSR and PSD permits for construction if locating in an area that has attained some but not all NAAQS.<sup>346</sup> Under an NNSR permit, a new or modified source must install control technologies that will produce the lowest achievable emission rate (LAER) of the specific criteria pollutant for which the area is in non-attainment. The source also must offset its emissions of such pollutants by obtaining emissions reductions from other sources. States must develop plans to implement the NNSR program, including the issuance of preconstruction permits, the application of all reasonably available control measures (even to existing sources), the inventory of emissions, and the achievement of reasonable progress.<sup>347</sup> States must bring non-attainment areas into attainment within certain deadlines: five years for primary NAAQS, and as expeditiously as practicable for secondary NAAQS.<sup>348</sup>

If EPA lists greenhouse gases as criteria pollutants, the NAAQS set would place various areas of the country (or perhaps the entire country at once) into either attainment or non-attainment. In such a situation, the PSD and NNSR permitting processes would necessarily apply to greenhouse gas emissions.<sup>349</sup> Chapters Five and Six discuss the implications of applying New Source Review to greenhouse gases, including EPA’s various options for setting NAAQS, which areas of the country would fall into non-attainment under those various scenarios, and whether the resulting PSD and NNSR programs would be workable or would necessarily entail intolerable administrative burdens and compliance costs.

But given EPA’s potential discretion on issuing NAAQS for GHGs, perhaps the more important question is whether and how NSR permitting may automatically apply to greenhouse gases even if they are not listed as criteria pollutants. In such a case, there would still be three ways in which greenhouse gases could be incorporated into the NSR permitting process. First, PSD permits could require sources to install best available control technology (BACT) for greenhouse gas emissions. Second, greenhouse gas emissions could qualify a source as a “major emitting facility” which must undergo preconstruction PSD permitting. Third, climate change could be one of the environmental costs to be analyzed during NSR permitting.

This section concludes that EPA may temporarily have discretion not to list GHGs as “regulated pollutants” and not to prescribe BACT for such emissions. However, GHGs will inevitably qualify as “regulated pollutants” in the future, and EPA should anticipate that outcome. By contrast, EPA has little discretion on the interpretation of “major emitting facility” and cannot invoke the absurd results canon to avoid treating significant sources of GHGs as “major emitting facilities.” Finally, EPA can only grant NNSR permits if benefits outweigh all costs, including the environmental costs of climate change. EPA also must give appropriate weight to climate change considerations during PSD permitting decisions.

### **B.1. EPA Must Eventually Require BACT for GHGs**

New and modified major emitting facilities in PSD areas must obtain preconstruction permits. Section 165(a)(4) states that “[n]o major emitting facility . . . may be constructed . . . unless . . . the proposed facility is subject to *the best available control technology for each pollutant subject to regulation under this Act* emitted from . . . such facility.”<sup>350</sup> The scope of the phrase “each pollutant subject to regulation” has become a highly contentious point, since the required BACT for a given pollutant can be potentially quite expensive.<sup>351</sup> In particular, if greenhouse gases are “regulated pollutants,” PSD permits will require installation of BACT for those greenhouse gas emissions.

This contentious issue will be mooted once EPA issues actual emissions standards for various greenhouse gases, as discussed above. EPA will inevitably regulate greenhouse gases under Title II of the Clean Air Act, at which point GHGs will qualify as “regulated” under any definition of the term.<sup>352</sup> However, such regulations may not be finalized for several months or longer. Until then, the status of GHGs as “regulated pollutants” and the requirements of the PSD permitting process remain in limbo.

To date, EPA has been unwilling to interpret “regulated pollutant” to include GHGs or to require the installation of BACT for GHG emissions as a condition of PSD permits.<sup>353</sup> A few GHGs are already referenced in either the CAA or in regulations promulgated under the statute, but they are not “regulated” in the traditional sense of being subject to emissions restrictions.<sup>354</sup> For example, under Section 821 of the Clean Air Act, EPA is required to (and in fact did in 1993) issue regulations on the monitoring of carbon dioxide.<sup>355</sup> The key question of statutory interpretation, therefore, is whether the phrase “subject to regulation” includes pollutants under monitoring requirements or is restricted to pollutants under emissions controls. The fact that EPA has recently proposed regulations to require the monitoring of all GHGs makes this question even more important.<sup>356</sup>

In a recent legal challenge on whether BACT should be required for carbon dioxide emissions,<sup>357</sup> the EPA’s Environmental Appeals Board found that the scope of the statutory phrase “subject to regulation” was neither clear nor unequivocal, and the board remanded the issue back to EPA to reconsider its interpretation.<sup>358</sup> Legislative history and statutory structure do not fully clarify the meaning of the phrase “subject to regulation,” though some evidence could support EPA’s discretion to exclude GHGs from the definition.<sup>359</sup> On the other hand, some state governments strongly disagree and believe that the plain text of the statute requires PSD permits to specify carbon dioxide BACT.<sup>360</sup> Notably, most state governments are the PSD permitting authorities within their own borders, and their interpretations of requirements therefore have great significance.<sup>361</sup>

EPA recently announced its intention to review its interpretation of the phrase.<sup>362</sup> The agency does not currently appear to be under any obvious statutory obligation to interpret the phrase to include carbon dioxide or other GHGs. But looking down the road, EPA will inevitably regulate greenhouse gases with specific emissions standards, and future PSD permits will need to reflect those gases as regulated pollutants. Given the inevitable future of PSD permitting and EPA's discretion to interpret the statutory language, EPA may want to take the first steps down that path sooner rather than later, giving itself more time to sort out the practical implications. EPA should also review all pending PSD applications in light of this conclusion.

New and modified major sources must eventually install control technology for their GHG emissions. EPA must treat significant GHG sources as “major emitting facilities.” When issuing permits to new and modified sources, EPA cannot ignore climate change as an “environmental cost.”

## **B.2. EPA Must Treat GHG Sources As “Major Emitting Facilities”**

New and modified sources in PSD areas require permits only if they are “major emitting facilities.” Plain statutory language and court interpretation suggest that major sources of greenhouse gases automatically and immediately qualify as major emitting facilities for the purposes of PSD permitting. However, EPA regulations have historically limited the scope of covered facilities to major sources of “regulated NSR pollutants,” rather than sources of “any air pollutant.” The following analysis concludes that EPA’s statutory interpretation is not permissible, and the definition of “major emitting facility” must include significant sources of GHG emissions.

EPA’s historical interpretation of “major emitting facility” contradicts the plain statutory language. Section 169(1) defines a “major emitting facility” for purposes of PSD permitting as:

any of the following [28 specific]<sup>363</sup> stationary sources of air pollutants which emit, or have the potential to emit, one hundred tons per year or more *of any air pollutant* . . . [and] any other source with the potential to emit two hundred and fifty tons per year or more *of any air pollutant*. This term shall not include new or modified facilities which are nonprofit health or education institutions which have been exempted by the State.<sup>364</sup>

Regardless of whether carbon dioxide or other greenhouse gases qualify as “pollutant[s] subject to regulation” under Section 165 for purposes of applying BACT requirements, *Massachusetts v. EPA* clearly stated that carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are “air pollutants” under the Clean Air Act.<sup>365</sup> Thus, according to strict interpretation of the statute, any major source of such gases should already be a major emitting facility. The same logic should apply automatically and immediately to major sources of the other main greenhouse gases—sulfur hexafluoride and perfluorocarbons.

Many such sources, like power plants, would have previously or independently qualified as major emitting facilities due to their emissions of other pollutants. However, some sources never before subject to PSD permitting requirements should now count as major emitting facilities purely due to their greenhouse gas emissions. Compared to conventional pollutants, some greenhouse gases (in particular carbon dioxide) are frequently emitted in vastly larger quantities. A traditional 500 megawatt coal-fired plant is estimated to emit annually 114 pounds of lead, 720 tons of carbon monoxide, and 10,000 tons of sulfur dioxide, but nearly 4 *million* tons of carbon dioxide.<sup>366</sup> Even relatively small sources—such as indoor malls, many apartment buildings, large houses of worship,

some restaurants, and even bakeries<sup>367</sup>—have the potential to emit enough carbon dioxide to meet the threshold for major emitting facilities.

Similarly, “modification” is defined as “any physical change in, or change in the method of operation of, a stationary source which increases the amount of *any air pollutant* emitted by such source or which results in the emission of *any air pollutant* not previously emitted.”<sup>368</sup> This means that sources that already qualify as major emitting facilities will require a PSD permit if a physical or operational change increases their emissions of any greenhouse gas by any amount, even if they do not emit large amounts of other traditional pollutants.<sup>369</sup> For example:

- A new chain restaurant with an average-size commercial kitchen plans to locate in an area in attainment for all criteria pollutants. The kitchen uses natural gas appliances that have the annual potential to emit less than one ton each of carbon monoxide, nitrogen oxides, sulfur dioxide, and particulate matter. But the kitchen will have the potential to emit nearly 600 tons per year of carbon dioxide.<sup>370</sup> Thus, based on its potential greenhouse gas emissions, the restaurant will be considered a major emitting facility, will need a PSD permit, and will have to install BACT for all regulated pollutants (i.e., carbon monoxide, nitrogen oxides, sulfur dioxide, particulate matter, and so forth).
- An existing 500-megawatt coal-fired power plant is located in an area in attainment for all criteria pollutants. The plant plans to increase production by 0.1%, an operational modification that will increase its emissions of lead by 0.1 pounds per year, of carbon monoxide by 0.7 tons per year, and of sulfur dioxide by 10 tons per year.<sup>371</sup> None of those increases are significant under EPA’s definitions.<sup>372</sup> But the plant’s carbon dioxide emissions would increase by 4000 tons per year, and therefore the source will be subject to PSD permitting for its modification.

Despite the administrative difficulties and compliance burdens such an expanded scope of coverage would entail, this is the necessary interpretation of the plain statutory language. In *Alabama Power v. Costle*, the principal case interpreting the PSD statutory provisions, the D.C. Circuit observed:

The definition [in Section 169(1)] is not pollutant-specific, but rather identifies sources that emit more than a threshold quantity of any air pollutant. Once a source has been so identified, it may become subject to section 165’s substantial administrative burdens and stringent technological control requirements for each pollutant regulated under the Act, even though the air pollutant, emissions of which caused the source to be classified as a “major emitting facility,” may not be a pollutant for which NAAQS have been promulgated or even one that is otherwise regulated under the Act.<sup>373</sup>

Similarly, the court noted that:

the [Section] 169(1) definition of major emitting facility refers to a broader category of pollutants than does that of [Section] 165. Section 169 sets as a threshold the emission of “any air pollutant,” and [Section] 302(g) defines that extremely broadly.<sup>374</sup>

However, EPA has never followed this strict interpretation of the phrase “any air pollutant.” In its initial rulemakings after the 1977 amendments to the Clean Air Act, EPA reinterpreted the definition of major emitting facilities as any source with the potential to emit the threshold amount of “any air pollutant *regulated under the Clean Air Act*.”<sup>375</sup> Some commentators have speculated that EPA chose to restrict the scope of PSD provisions to “pollutants regulated under the Act” out of fear that, otherwise, modifying sources would be forced to undergo PSD review even for very small emission increases of certain hazardous air pollutants (like 0.1 tons of mercury).<sup>376</sup> Yet even after the 1990 amendments to the Clean Air Act statutorily removed all hazardous air pollutants from

the scope of PSD permitting, EPA did not significantly change the definition.<sup>377</sup> Instead, in 2002, EPA simply rephrased, saying major sources were those emitting “regulated NSR pollutants.”<sup>378</sup>

To the extent some states already define GHGs as “regulated pollutants,” and if EPA changes its definition of “subject to regulation” to include GHGs, the distinction between “any pollutant” and “regulated pollutants” will matter less.<sup>379</sup> However, if EPA continues to define “regulated pollutant” to exclude GHGs or if states continue to define “regulated pollutant” in such a manner, the distinction is crucial to determining which sources count as “major emitting facilities” and which modifications are “major modifications.”<sup>380</sup>

The plain language of the statute would automatically and immediately require PSD permits for any major source of greenhouse gases. Yet the result of such an interpretation would be a tremendous expansion of the scope of the PSD permitting process, adding considerably to both the compliance costs and administrative costs of the program. No government agency on record, no environmental advocacy groups, and no industry trade groups favor such an outcome.<sup>381</sup> Some may even argue that EPA could be allowed to ignore plain language to avoid such absurd results.

Unfortunately, the absurd results canon is only applicable in those “rare cases”<sup>382</sup> when legislative history offers “extraordinarily convincing justification.”<sup>383</sup> The burden of proof is “especially heavy” when seeking “a prospective exemption of certain categories from a statutory command based upon the agency’s prediction of the difficulties of undertaking regulation,” compared to an exemption sought after first trying to enforce the strict statutory language.<sup>384</sup> Ultimately, the legislative history of the PSD program does not provide “extraordinarily convincing justification” that Congress did not intend for sources emitting over two hundred fifty tons of greenhouse gases to count as major emitting facilities. Rather, the legislative history shows a deliberate broadening of the definition of “major emitting facilities.”<sup>385</sup>

Thus, neither EPA nor states can continue to define “major emitting facilities” only as sources of regulated NSR pollutants. Major sources of greenhouse gases must be regulated as major emitting facilities, a result that flows directly from the holdings in *Massachusetts v. EPA*. Chapter Six discusses EPA’s best options for complying with this mandatory obligation.

### **B.3. EPA Must Consider All Environmental Costs during the NSR Process**

The consideration of environmental costs and alternatives is an integral part of the NSR permitting process. In making case-by-case BACT determinations, PSD permitting authorities are instructed by statute to “tak[e] into account energy, *environmental*, and economic impacts and other costs.”<sup>386</sup> EPA has long acknowledged that this provision gives it “authority to evaluate, for example, the environmental impact of unregulated pollutants in the course of making a BACT determination for the regulated pollutants.”<sup>387</sup> Though the weight assigned to such factors is in EPA’s discretion, “EPA may ultimately choose more stringent emission limitations for a regulated pollutant than it would otherwise have chosen if setting such limitations would have the incidental benefit of restricting a hazardous but, as yet, unregulated pollutant.”<sup>388</sup> Similarly, interested persons can submit “alternatives” for consideration during the PSD permit review process, and EPA must require analysis of climate and meteorology as part of PSD permit approval.<sup>389</sup>

While some of the environmental analysis components of PSD permitting are discretionary or optional, NNSR requirements are more mandatory. In particular, NNSR permits may be issued only if “an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source demonstrate that benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification.”<sup>390</sup>

Gregory Foote, a longtime assistant general counsel for EPA, has made a convincing argument that a source's potential impacts on climate change must be incorporated into this environmental review component of NSR permitting decisions.<sup>391</sup> In particular, the choice of BACT for regulated pollutants should factor in the incidental benefits to climate change of more stringent controls, and NNSR permits should only be granted if benefits of siting the source outweigh all costs, including climate costs.

Once EPA has issued endangerment findings under Section 202 that greenhouse gases present significant threats to public health and the environment, it will be difficult for EPA and state permitting authorities to avoid the inclusion of climate change considerations in NSR determinations, especially in light of the mandatory language for the NNSR permitting process. There is more discretion built in to the BACT determinations under PSD permitting, but ultimately that only allows EPA and state authorities to decide how much weight to give climate change considerations; choosing to ignore such environmental costs is not a viable option under the statute.

For any pending and future PSD or NNSR permit applications, EPA must give the appropriate weight to the environmental and social costs of climate change.

#### **B.4. Timetable for Required Actions**

For the time being, EPA has discretion to determine whether greenhouse gases are "pollutants subject to regulation" for which BACT standards must be set. However, once EPA finalizes regulations for greenhouse gases, as required by other sections, the agency will have to start setting BACT for GHG emissions. The PSD permitting process is so complex and individualized that it can last over a year, especially for large sources like power plants. Given the inevitable application of BACT to greenhouse gases, EPA should signal to current applicants the probability that permits will be denied in the future for failure to install BACT for greenhouse gases.

Major sources of greenhouse gases immediately qualify as major emitting facilities subject to permit requirements. As discussed in Chapter Six, EPA will have some ability to phase-in the application of such requirements or otherwise build flexibility in to the program. EPA must immediately begin to consider the environmental costs of climate change when reviewing NNSR applications. The agency will have more discretion on weighing such costs in PSD permit applications, but it can no longer ignore a source's implications for climate change.

Because NSR programs are mostly implemented by states under EPA-approved implementation plans, "there may be a lag time in a small number of states if their PSD regulations are written in such a way that revision of the regulations (and EPA approval) would be required to give the state authority to issue permits for GHGs."<sup>392</sup>

### **C. New Source Performance Standards**

New Source Performance Standards (NSPS) were largely designed as a supplement to EPA's regulation of criteria pollutants, though they have a broader potential application. Section 111 gives EPA authority to prescribe federal standards for certain source categories that contribute significantly to dangerous pollution. Section 111 is source-specific rather than pollutant-specific: EPA first determines whether a source category should be regulated, and then the agency decides what performance standards should apply to emissions from such sources. The performance standards apply primarily to new and modified sources and require the best adequately-demonstrated emissions reduction system achievable, taking into account costs. For non-criteria



pollutants, EPA can also apply such standards to existing sources and can require states to develop plans to control such emissions.

There are three ways a Section 111 performance standard could apply to sources of greenhouse gases. First, EPA could be required to list new categories of sources based on their greenhouse gas emissions. Second, EPA could be required to revise its performance standards for source categories already listed, adding standards for greenhouse gas emissions. Third, EPA could be required to regulate existing sources of greenhouse gases in addition to new and modified sources.

This section concludes that EPA has discretion in deciding which new categories to list, and when, but the agency must act in a reasonable time and manner. EPA must also follow the statutory process and deadlines for revising its standards for already-listed categories. If, upon review, a source is found to emit a dangerous GHG pollutant, and if prescribing a performance standard is feasible, then EPA must issue regulations. Once EPA has issued a performance standard for GHG emissions from new and modified sources, it will likely have to extend such regulations to cover existing sources as well. Finally, EPA cannot ignore petitions for rulemakings and must act to finalize its pending rulemakings.

### **C.1. Listing New Categories of Greenhouse Gas Sources**

EPA must issue performance standards for new sources belonging to listed categories.<sup>393</sup> EPA must add a category of sources to its list according to the prescriptions of Section 111(b)(1)(A):

The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, publish (and from time to time thereafter shall revise) a list of categories of stationary sources. He shall include a category of sources in such a list if in his judgment it causes, or contributes significantly to, air pollution which may reasonably be anticipated to *endanger public health or welfare*.<sup>394</sup>

As with several other provisions of the Clean Air Act, mandatory actions are triggered by a positive endangerment finding. While previous endangerment findings made under other sections of the CAA may present partial precedents, the endangerment finding for new source performance standards is different.

EPA has discretion in deciding which new source categories to list, but the agency cannot ignore petitions. EPA must make reasonable progress through its backlog. **If, upon review, a source is found to contribute significantly to dangerous GHG pollution, then EPA must issue regulations.**

### **Endangerment Findings Are Not Automatic or Mandatory**

The endangerment finding for new source performance standards asks only two questions. First, is the air pollution in question reasonably anticipated to endanger public health or welfare? Second, does the category of sources in question, in EPA's judgment, cause or contribute significantly to that air pollution? Note that, unlike the endangerment finding for criteria pollutants, Section 111(b)(1)(A) does not mention specific "air pollutants" but only general "air pollution." Section 111 is a source-specific provision rather than a pollutant-specific provision.

The first question will be satisfied by any endangerment finding EPA makes under Section 202 for motor vehicles, which will focus broadly on "greenhouse gas pollution." Thus, the first question is satisfied for any greenhouse gas that contributes to greenhouse gas pollution.

The second question asks whether, in EPA's judgment, a category of sources causes or contributes significantly to that air pollution. Again, recall that this provision is not pollutant-specific. Even if neither the carbon dioxide emissions nor the methane emissions of a hypothetical source were individually large enough to contribute significantly to dangerous pollution, the combination of the two may significantly contribute, and the source would be listed.

The Section 202 endangerment finding would not satisfy this second requirement, since Section 202 applies to motor vehicle sources specifically, not to stationary sources. If EPA issues a positive endangerment finding under Section 108, that determination also would not automatically resolve the endangerment finding under Section 111. Section 108 asks about the effects of multiple stationary or mobile sources; a Section 111 endangerment finding must show that one specific category of sources contributes significantly to dangerous pollution. Additionally, Section 108 only asks whether emissions "cause or contribute." Section 111 requires that a source "contribute *significantly*" to dangerous air pollution. Such determinations are left to EPA's reasonable "judgment."<sup>395</sup>

### **EPA Has Considerable Discretion on Listing New Categories**

No action following *Massachusetts v. EPA* will automatically require EPA to list a specific new source category and issue performance standards. EPA must revise its list of significant sources, but the agency is only instructed to do so "from time to time." That provision gives EPA considerable leeway in deciding when and in what order to study various sources of greenhouse gases. So long as EPA proceeds to study sources and undertake endangerment findings in a reasonable manner and time, Section 111(b)(1)(A) requires nothing further.

Notably, though, a positive endangerment finding is the only prerequisite for listing new categories of sources. If, in EPA's judgment, sources do contribute significantly to dangerous pollution, the agency has no discretion to choose not to list the source. If either the Section 202 endangerment finding or the optional Section 108 endangerment finding were broad enough to address the contributions of specific stationary sources, EPA would have to list such source categories under Section 111.

### **EPA Has No Discretion to Ignore Petitions**

Section 111(g) gives state government substantial power to limit the discretion of EPA:

(2) Upon application of the Governor of a State, showing that any category of stationary sources which is not included in the list under subsection (b)(1)(A) contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare (notwithstanding that such category is not a category of major stationary sources), the Administrator shall revise such regulations to specify such category of stationary sources.

....

(5) Unless later deadlines for action of the Administrator are otherwise prescribed under this section, the Administrator shall, not later than three months following the date of receipt of any application by a Governor of a State, either—(A) find that such application does not contain the requisite showing and deny such application, or (B) grant such application and take the action required under this subsection.

Using this provision, state governments can put EPA under a three-month deadline to act with respect to a new category of sources. States have already shown they are willing to press EPA to regulate greenhouse gases. EPA should be prepared to respond to Section 111(g) petitions to list greenhouse gas sources, and the agency will only be able to deny such applications if the full factual record supports that the sources do not significantly contribute. EPA will have discretion to define

“significance,” but the interpretation must be reasonable.

## **C.2. Revising Standards for Already-Listed Categories**

EPA has already listed dozens of source categories under Section 111, including cement plants, petroleum refineries, steel plants, various steam-generating units, and many other significant sources of greenhouse gas emissions.<sup>396</sup> EPA must periodically review the standards it has promulgated for such listed categories:

The Administrator shall, at least every 8 years, review and, if appropriate, revise such standards following the procedure required by this subsection for promulgation of such standards. Notwithstanding the requirements of the previous sentence, the Administrator need not review any such standard if the Administrator determines that such review is not appropriate in light of readily available information on the efficacy of such standard.<sup>397</sup>

EPA has claimed that this provision creates no mandatory obligation to regulate new pollutants. First, the agency has cited statutory text and legislative history to support that it must only revise standards for already-regulated pollutants.<sup>398</sup> Second, EPA claims discretion to issue only “appropriate” standards.<sup>399</sup> Third, specifically on greenhouse gases, EPA suggests it need not regulate new pollutants if such regulation would trigger other provisions of the Clean Air Act that carry significant administrative burdens (such as BACT requirements for “regulated pollutants”).<sup>400</sup> None of these arguments will hold up, and EPA must regulate the GHG emissions of listed categories.

### **Revision Process Includes Adding New Standards**

Section 111(f) demonstrates that Congress wanted EPA to consider issuing standards for any pollutant emitted by a listed source, not just already-regulated pollutants. For categories that EPA had listed before 1990 but had never regulated, Section 111(f) describes the process for promulgating new standards for these listed sources. In particular, EPA was to consider: “the extent to which *each [emitted] pollutant* may reasonably be anticipated to endanger public health or welfare.”<sup>401</sup> In other words, EPA is to consider every dangerous pollutant emitted by a source.<sup>402</sup> Congress never intended for EPA’s decision to regulate some pollutants from listed sources to prevent the agency from regulating additional dangerous pollutants in the future.<sup>403</sup> The review process includes the addition of any appropriate new standards, not just the revision of those standards already in effect.<sup>404</sup>

### **“Appropriate” Does Not Make Revisions Optional**

EPA is instructed to promulgate “appropriate” standards of performance. The D.C. Circuit Court of Appeals has ruled that, generally, such language indicates an “explicit and extraordinarily broad” delegation of authority.<sup>405</sup> However, the Clean Air Act does not consistently use the term “appropriate,” and the Supreme Court has held that the same words may be construed differently “not only when they occur in different statutes, but when used more than once in the same statute or even in the same section.”<sup>406</sup> For example, a single sentence in Section 107(c) uses the term for two very different meanings:

The Administrator shall, within 90 days after the date of enactment of the Clean Air Amendments of 1970, after consultation with *appropriate* State and local authorities, designate as an air quality control region any interstate area or major intrastate area which he deems necessary or *appropriate* for the attainment and maintenance of ambient air quality standards.

In the first use of the term, the closest meaning for “appropriate” is “applicable” or “necessary.” In this context, the term refers to the identification of which individuals of a group are relevant for certain purposes. This task is likely to involve little agency discretion (for example, EPA has no discretion to decide which states are part of an interstate area). In its second use, “appropriate” means “suitable” or “useful”—a determination that can only take place after an assessment of the value of a particular choice, thus leading to a certain degree of agency discretion.

In Section 111, EPA is instructed to “at least every 8 years, review and, if appropriate, revise such standards.” Statutory structure and legislative history suggest that Congress intended to use “appropriate” in the sense of “applicable” or “necessary,” so that the D.C. Circuit’s interpretation of the same language in a different context is not applicable.

The structure of Section 111 reveals the goal of continually updating performance standards to reflect the latest science, technological innovation, and economic conditions.<sup>407</sup> But if those factors have not changed in the past eight years, there is no need to revise the standards. The phrase “if appropriate” tells EPA it need not automatically revise *all* standards every eight years; rather, EPA should identify those standards for which a change in science, technology, or economics requires a revision. This conclusion is supported by the subsequent statutory provision, which exempts a standard from review only if such review is unnecessary “in light of readily available information.”

Legislative history further buttresses this interpretation. In 1977, Congress amended Section 111(b)(1)(B), which had originally said that EPA “may, from time to time,” revise standards; Congress struck that phrase and substituted the phrase “shall, at least every four years, review and, if appropriate [revise].”<sup>408</sup> The House Committee Report explained the change was made deliberately to “rectify[ ] the administration’s failure to establish adequate initial or revised standards.”<sup>409</sup> In 1990, the section was again amended, to allow an eight year period for review instead of four years. In explaining the amendment, the House Committee Report described a mandatory and rigid process for review and revision, waiveable only if “not necessary in light of readily available information.”<sup>410</sup>

The term “appropriate” does not give EPA license not to issue controls for pollutants found to be dangerous, or not to increase stringency of controls when such revisions are feasible. Instead, EPA must “follow[ ] the procedure required by this subsection for promulgation of such standards.” If, upon review, a source is found to emit a dangerous pollutant, and if prescribing a performance standard is feasible, then revision is “appropriate” in the sense of being necessary and applicable.

### **EPA Cannot Invoke the Absurd Results Canon**

EPA has suggested it cannot issue performance standards for greenhouse gas emissions because such regulation would trigger other provisions of the Clean Air Act that carry significant administrative burdens. In particular, greenhouse gases would become “regulated pollutants,” and PSD applicants would be required to install BACT for such pollutants. This argument is not persuasive. To the extent it has any force, it suggests an exemption for greenhouse gases from PSD permitting, where application could be difficult or unworkable; it does not suggest an exemption for greenhouse gases from NSPS, where application is possible.<sup>411</sup> Moreover, the fact that PSD permits may already have to

EPA is far beyond the prescribed eight year period for review and revision for many listed source categories that emit GHGs. **EPA must take prompt action to address these multiple deadline violations.**

require BACT for certain GHGs—or may have to do so very shortly—undercuts this argument. (See Appendix for more on the absurd results canon.)

### **Timeline for Mandatory Revisions**

EPA can only avoid reviewing the greenhouse gas emissions from listed categories if those categories' standards have been reviewed within the last eight years.<sup>412</sup> Otherwise, EPA must consider whether such sources contribute significantly to dangerous pollution. EPA will retain its discretion to define "significant," but the agency must support such determinations of significance with a reasoned explanation and an adequate factual record.

EPA is far beyond the prescribed eight year period for review and revision for many listed source categories.<sup>413</sup> EPA must take prompt action to address these multiple deadline violations, and during its review it must consider each source category's emissions of every dangerous pollutant, including greenhouse gases. EPA must devise a plan to make reasonable progress through its backlog of reviews. (See Appendix for more on EPA's discretion on timing.)

### **C.3. EPA Must Apply Its Performance Standards to Existing Sources**

If EPA does prescribe new source performance standards for a significant source of greenhouse gas emissions, the agency may then be required to regulate existing sources as well, depending on whether GHGs have been listed as criteria pollutants. Section 111(d) states:

The Administrator *shall* prescribe regulations which *shall* establish a procedure similar to that provided by section 110 under which each State *shall* submit to the Administrator a plan which (A) establishes standards of performance for any existing source for any air pollutant (i) for which air quality criteria have not been issued or which is not included on a list published under section 108(a) [or emitted from a source category which is regulated under section 112] [or 112(b)] but (ii) to which a standard of performance under this section would apply if such existing source were a new source.<sup>414</sup>

By using the word "shall," this provision creates a mandatory procedure. Generally, once EPA has developed performance standards for new and modified sources, it must also initiate a process to require state regulation of existing sources in the same category. Only if the greenhouse gas is already listed as a criteria pollutant (under Section 108) or as a hazardous air pollutant (under Section 112) will this provision not apply.

Granted, the bracketed language in the provision creates some uncertainty: the House and the Senate each enacted different amendments to this provision in 1990, and the difference was never reconciled by the Conference Committee. Some interpretations of this provision would limit the applicability of Section 111 to certain existing sources.<sup>415</sup> EPA has presented a convincing case that there are several reasonable and permissible ways to resolve the conflict.<sup>416</sup> Should EPA choose a literal reading of the House language, EPA would be barred from using Section 111(d) to target greenhouse gases from any existing source category that is regulated under Section 112—notably including electric utility steam generating units. However, EPA is more likely to adopt a compromise reading that only bars using Section 111(d) to regulate pollutants specifically listed as hazardous under Section 112.<sup>417</sup> Assuming GHGs will not be listed as either criteria pollutants (under 108) or as hazardous air pollutants (under 112), EPA can—and indeed, must—regulate existing steam generating units and other sources of GHGs for which it has promulgated new source performance standards under Section 111.

#### **C.4. EPA Must Act on Pending Rulemakings and Petitions**

Several pending rulemakings, petitions, and lawsuits are relevant to the promulgation of greenhouse gas performance standards. For pending rulemakings—in particular the proposed revisions to the performance standards for cement manufacturing plants—EPA is under a statutory obligation to consider any public comments received and make appropriate modifications to the standards before finalization.<sup>418</sup> Given the above conclusions and the comments received on rulemakings like the one for cement plants,<sup>419</sup> EPA should include greenhouse gas performance standards in the final rules. Final rules are due one year after publication of the proposal,<sup>420</sup> meaning EPA has until June 16, 2009 to finalize regulations for cement plants.<sup>421</sup>

Some petitions and lawsuits have been remanded to EPA in the wake of *Massachusetts v. EPA*. For example, in 2006, EPA revised the new source performance standards for electric utility and other steam generating units. The regulations did not include any emission standards for carbon dioxide, even though power plants are the largest source of carbon dioxide emissions from fossil fuel combustion. Several states and local governments filed a petition for review in the D.C. Circuit Court of Appeals.<sup>422</sup> On September 24, 2007, the court remanded the case to EPA “for further proceedings in light of *Massachusetts v. EPA*.” Despite the remand, EPA has still proposed no new source performance standards for carbon dioxide emissions from power plants.<sup>423</sup> EPA must respond to such petitions in a reasonable amount of time and must apply the above conclusions of law.

Most recently, EPA was sued to control the nitrous oxide emissions of nitric acid plants through a new source performance standard. For these plants and other source categories, EPA is far beyond the prescribed eight year period for review and revision.<sup>424</sup> EPA must take prompt action to address these multiple deadline violations, and during its review it must consider each source category’s emissions of every dangerous pollutant, including greenhouse gases.

#### **C.5. Timeline for Required Actions and Choices**

EPA must respond to all pending petitions and lawsuits within the time periods prescribed by court or by principles of administrative law. If EPA lists a new category of sources either on its own motion or in response to a state petition, it has one year to propose standards.<sup>425</sup> EPA has one year from the date new or revised performance standards were proposed to finalize those standards. Performance standards become effective upon finalization.<sup>426</sup> EPA must review standards for all listed categories every eight years, and the agency must move through its backlog of overdue reviews with reasonable progress. Therefore, some action on at least such categories as cement plants, steam generating units, and nitric acid plants is required in the near future. (See Appendix for more on EPA’s discretion on timing.)

Importantly, each separate new source performance standard is a final agency action that can be challenged in court. The high potential for litigation will significantly extend the time horizon for realistic enforcement of any greenhouse gas performance standards.

### **D. Hazardous Air Pollutants**

The Clean Air Act distinguishes between two broad categories of air pollutants: criteria pollutants and hazardous air pollutants. Criteria pollutants are emitted in great quantities and cause problems across broad regions of the country; only a few pollutants have been listed as criteria pollutants. By contrast, hazardous air pollutants are highly toxic even in small quantities; hundreds of pollutants qualify as hazardous air pollutants.<sup>427</sup> Section 112 was designed (and significantly

redesigned in 1990) to place tight controls on air pollutants that threaten severe, adverse effects on human health or the environment. The threshold size for sources subject to regulation is very small (ten tons), and both new and existing sources are subject to potentially stringent risk-based emissions limitations.<sup>428</sup>

EPA will not be required to list any greenhouse gas as a hazardous air pollutant. Section 112 states that EPA:

shall *periodically* review the list established by this subsection and publish the results thereof and, *where appropriate*, revise such list by rule, adding pollutants which present, or may present, through inhalation or other routes of exposure, a threat of adverse human health effects (including, but not limited to, substances which are known to be, or may reasonably be anticipated to be, carcinogenic, mutagenic, teratogenic, neurotoxic, which cause reproductive dysfunction, or which are acutely or chronically toxic) or adverse environmental effects whether through ambient concentrations, bioaccumulation, deposition, or otherwise.

No greenhouse gas presents any adverse human health effects through direct exposure to current concentrations.<sup>429</sup> But ambient concentrations of greenhouse gases arguably do present a threat of adverse environmental effects, as defined by Section 112.<sup>430</sup> Previous endangerment findings will have already made such a determination, and so greenhouse gases might automatically qualify as hazardous air pollutants under the second prong of the definition.

However, the statutory steps for listing additional toxic pollutants do not appear to be mandatory.<sup>431</sup> Rather, EPA is given authority to revise the list “periodically” and “where appropriate.” As explained above, the term “appropriate” can have one of two possible meanings: applicable and necessary, or suitable and useful. The first definition indicates the agency has no discretion; the second grants EPA the authority to choose.

In this case, statutory structure and legislative history mostly support the second reading, granting EPA discretion. Unlike the new source performance standard revisions, where EPA was asked to identify which standards required revision, here EPA is being asked to assess the appropriateness of adding a new pollutant to the list. The discretionary nature of that assessment is reflected in the legislative history.

The House originally wanted to grant EPA explicit discretionary authority: “The Administrator may add or delete a substance.”<sup>432</sup> Meanwhile, the Senate had originally considered seemingly more mandatory language: “The Administrator shall, from time to time, but not less often than every five years, review and revise the list.”<sup>433</sup> Yet even though the Senate bill did not limit revisions only to “appropriate” cases and prescribed a tight timetable for review, the Senate still considered its provision to be highly discretionary: “The Administrator *may* add a substance to the list *on the Administrator’s own motion* using the criteria which apply to a determination...” and “The Administrator is given *authority* to modify the list by adding or deleting substances.”<sup>434</sup> Given that the language of Section 112 mirrors the Senate version but is even more discretionary (by letting EPA decide the timeline and make additions only “where appropriate”), it is likely that Congress had in mind a non-mandatory process.<sup>435</sup>

Ultimately, EPA’s discretion to choose not to list otherwise qualifying hazardous air pollutants under Section 112 is not a clear-cut case. Moreover, the permissible criteria upon which EPA may determine the appropriateness of listing a new hazardous air pollutant are not obvious. The choice not to list GHGs as hazardous air pollutant could be challenged in court as arbitrary and capricious, and the outcome of such litigation is difficult to predict. In the end, the only certain ways to avoid

any obligation to list greenhouse gases under Section 112 is to list them first as criteria pollutants, to regulate them first under Title VI of the Act,<sup>436</sup> or else for Congress to amend the legislation.

## E. Title V Permits

Congress added Title V in 1990 to establish “a comprehensive and uniform operating permit program for certain stationary sources.”<sup>437</sup> “The Title V permit program generally does not impose new substantive air quality control requirements. Instead, in order to ensure compliance with existing regulations, Title V requires permits to contain monitoring, record keeping, reporting, and other conditions.”<sup>438</sup> EPA is instructed to work with state authorities to implement the program, and most Title V permits are issued by state or local permitting authorities.<sup>439</sup> Title V also defines several procedural requirements.<sup>440</sup>

Section 502(a) makes unlawful the operation of any “major source” without a permit.<sup>441</sup> “Major source” is defined in Section 501(2) to include “any stationary source . . . as defined in Section 302.” Section 302(j) defines “major stationary source” as:

any stationary facility or source of air pollutants which directly emits, or has the potential to emit, *one hundred tons per year or more of any air pollutant . . .*<sup>442</sup>

Traditionally, EPA has not applied Title V to major sources of “any air pollutant,” opting instead to restrict application to “*regulated* air pollutants.”<sup>443</sup> EPA believes this limitation is “more consistent with the intent of Congress” and necessary to avoid regulation of “sources of carbon dioxide and methane.”<sup>444</sup> Unfortunately, just as in the context of New Source Review, such a limitation contradicts the plain statutory language and legislative history. In particular, the House Committee Report noted that “in light of the new definitions of ‘major sources’ under sections 112 and 302 . . . the number of operating permits, particularly for rather small sources, may be significant.”<sup>445</sup>

Just as in the New Source Review context, Title V permits automatically should apply to any major source of greenhouse gases. EPA is given authority to exempt sources if application would be “impractical, infeasible, or unnecessarily burdensome”—but EPA is expressly forbidden from exempting “any major source.”<sup>446</sup> Moreover, even if statutory language did not already apply to greenhouse gas sources, once greenhouse gases become subject to regulation under Title II or some other mandatory provision, Title V will clearly apply even under EPA’s more limited definition. EPA estimates that more than 550,000 additional sources would require Title V permits due to greenhouse gas emissions.<sup>447</sup> But note that some states already apply Title V requirements to greenhouse gas emissions.<sup>448</sup>

## F. Stratospheric Controls under Title VI

Congress created Title VI of the CAA to strengthen EPA’s authority to control the pollutants responsible for depleting the ozone layer. The concentrated layer of ozone gas in the stratosphere protects the planet from harmful solar radiation, and in the late twentieth century, commonly-used refrigerants, accelerants, and other chemicals were severely damaging that layer of protection.<sup>449</sup>

Section 602 generates an initial list of ozone-depleting substances that EPA must regulate and describes the conditions under which EPA “shall” add other ozone-depleting substances. Some of the pollutants already regulated under this provision have significant global warming potentials;<sup>450</sup> however, the six main GHGs—carbon dioxide, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride—do not have clear impacts on the ozone layer. Perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride can act in some industrial processes



as chemical substitutes to replace some of the ozone-depleting substances banned by Title VI, and EPA does regulate the use of such gases as substitutes.<sup>451</sup> However, none of the six main GHGs is directly subject to general emissions standards under Title VI.

Section 615 grants EPA much broader authority:

If, in the Administrator's judgment, any substance, practice, process, or activity may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere, and such effect may reasonably be anticipated to endanger public health or welfare, the Administrator *shall* promptly promulgate regulations respecting the control of such substance, practice, process, or activity.

The term "shall" typically indicates a non-discretionary duty, and what little legislative history exists on this provision roughly supports that conclusion.<sup>452</sup> Therefore, regulations are mandatory under Section 615 if EPA makes a two-part endangerment finding: (1) the substance or activity may reasonably be anticipated to affect the stratosphere; and (2) that effect may reasonably be anticipated to endanger public health or welfare. By "affect the stratosphere," Congress specifically intended to include "certain chemical reactions in the stratosphere [that] may result in potentially serious climatic change without depleting ozone."<sup>453</sup> Moreover, by "reasonably be anticipated to affect," Congress specifically intended to replicate the precautionary standard applied to other sections of the CAA.<sup>454</sup> In a floor statement by two chief sponsors of Title VI, Senators Chafee and Baucus explained:

"Human activities that are polluting the atmosphere, affecting the stratosphere, and, as a result, aggravating problems such as global climate change should be regulated by the Administrator under the authority of this section."

—Senators Chafee and Baucus, chief sponsors of Title VI

Human activities that are polluting the atmosphere, affecting the stratosphere, and, as a result, aggravating problems such as global climate change should be regulated by the Administrator under the authority of this section.<sup>455</sup>

Nevertheless, it is not clear whether science currently supports an endangerment finding for GHGs even under the precautionary standard set in Section 615. Greenhouse gases like methane are mostly concentrated in the troposphere; their stratospheric concentrations are significantly less dense and more variable.<sup>456</sup> Scientists continue to study the effect GHGs have on the stratosphere, and some studies suggest stratospheric GHGs may at times have a cooling effect (rather than a warming effect).<sup>457</sup> EPA is directed to use its "judgment" in making its endangerment finding, and current science does not necessarily dictate that EPA must find GHGs are anticipated to have an identifiable effect on the stratosphere.

Moreover, even if part one of the endangerment finding were satisfied, the scientific support for a positive finding in part two is even more tenuous. Scientists are just beginning to understand stratospheric-tropospheric dynamics, and the extent to which changing temperature in the stratosphere may affect temperature, air circulation, or weather patterns in the troposphere remains largely a mystery.<sup>458</sup> For example, the United Nation's Intergovernmental Panel on Climate Change reports a "low" level of scientific understanding for the radiative forcing of stratospheric water vapor and methane.<sup>459</sup> EPA is not necessarily required to conclude that any stratospheric effects of GHGs will endanger public health or welfare by contributing to global climate change.

At this time, based on current science, EPA can use its discretion in determining whether to issue a positive endangerment finding for GHGs under Section 615. Additionally, since Section 615 does not specify when EPA must make or review its findings, EPA will have discretion to prioritize and schedule its studies of the stratospheric effects of GHGs.<sup>460</sup> However, as scientific understanding of the stratosphere develops in the future, regulating GHGs under Section 615 may become mandatory.

Section 617 may provide another useful source of authority:

The President *shall undertake* to enter into international agreements to foster cooperative research which complements studies and research authorized by this title, and *to develop standards and regulations which protect the stratosphere* consistent with regulations applicable within the United States.<sup>461</sup>

This section critically offers the President a clear vehicle for participating in international negotiations regardless of whether Congress is prepared to ratify a climate change treaty. While the options for invoking Section 617 are discussed in Chapter Five, the provision does not appear to mandate any particular action. The section does use the mandatory term “shall,” and some legislative history does describe the section as creating a “legal obligation.”<sup>462</sup> However, ultimately the provision only requires that the President “*undertake* to enter into international agreements.” So long as the President can demonstrate that some general attempt to negotiate has been made, Section 617 does not demand any particular outcome or even the successful conclusion of negotiations.

As this Chapter has shown, the Clean Air Act contains significant requirements for the regulation of stationary source GHG emissions that will automatically be triggered in the near future. Some of these requirements—particularly those with respect to new and modified sources—will constrain EPA’s choices for regulating the causes of climate change. However, perhaps more important than the set of mandatory obligations is the range of regulatory options left to EPA’s discretion. With NAAQS, NSPS, and Title VI controls, the Clean Air Act gives EPA a diverse arsenal of approaches it can deploy to combat greenhouse gas emissions. The next Part explores EPA’s best strategy for wielding those tools most effectively and efficiently.

# Part Two

## EPA's Options to Create Effective and Efficient Greenhouse Gas Regulations

*"[T]here'll be an extraordinary burst of activity, not just at EPA, but also potentially from Congress. I think there's tremendous opportunity in those imperatives to move forward together, to move forward so we build on each other, rather than work across purposes."*<sup>463</sup>

—EPA Administrator Lisa Jackson, 2009

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# Open Paths

The Clean Air Act does not entirely tie EPA's hands: to the contrary, the statute offers the agency a range of regulatory tools. This Part explores how EPA can exercise its best options, not only to respond to its statutory obligations, but then to go beyond minimum requirements and use its discretion to construct a comprehensive strategy for climate change.

## Grounding Regulations in the Clean Air Act

Of course, EPA's regulatory powers are not without limits. Unlike some other federal agencies that enjoy extremely broad discretion to regulate in certain areas, no general authorizing statute gives EPA an open-ended command to protect the environment however it sees fit.<sup>464</sup> Rather, the agency is charged with implementing specific statutory provisions contained in the nation's environmental laws. Yet even within the confines of the statute, EPA enjoys broad discretion and—within reason—is free to interpret its obligations and options creatively in order to devise a rational approach to climate change.<sup>465</sup>

## The Benefits of “Cap-and-Trade”

Chapter Four explains that a “cap-and-trade” system is the most efficient design for a comprehensive climate change strategy. Not only is it the preferred approach in most legislative proposals and international negotiations, but it is also a strategy EPA can implement through use of its own discretionary authority under the Clean Air Act. Chapter Five expands on that idea and outlines EPA's best options for independently constructing an economy-wide cap-and-trade regime. Using only existing authority under the

Clean Air Act, EPA can achieve significant environmental benefits effectively and efficiently.

## Best Options to Carry Out CAA Requirements

Unfortunately, not all of EPA's mandatory obligations fit seamlessly into the cap-and-trade model. Chapter Six identifies which regulatory options available to EPA will satisfy statutory obligations while interfering the least with a comprehensive cap-and-trade system. Even though EPA cannot perfectly replicate the efficiency that Congress could achieve by enacting new climate legislation, neither can EPA afford to wait and try to guess if and how Congress will eventually act. The urgency of climate change means EPA must begin acting now.

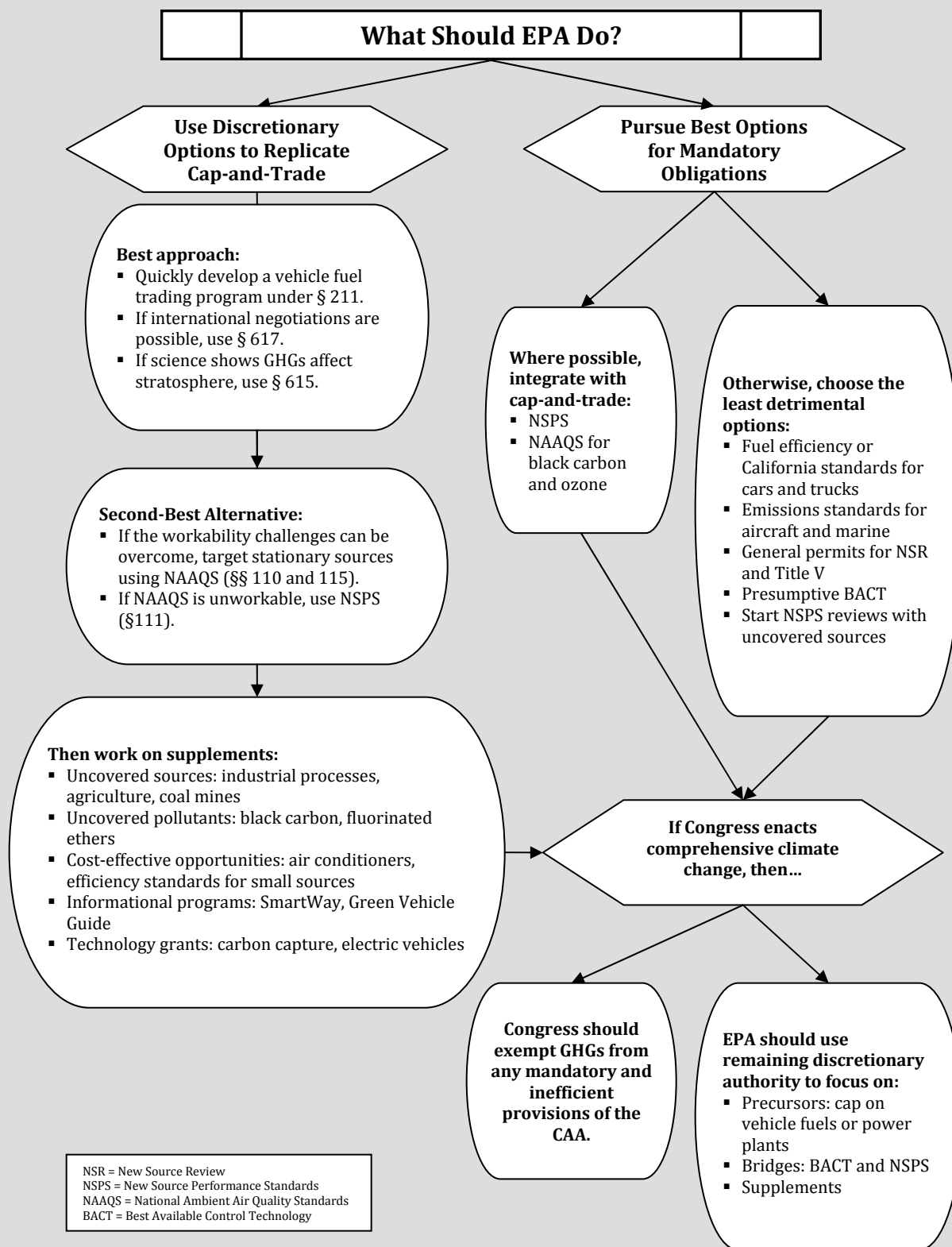
## After Cap-and-Trade

So long as EPA constantly pursues regulatory options that are the most efficient and most compatible with a national greenhouse gas trading program, EPA can begin to advance environmental goals without interfering with future congressional action. If Congress does act, EPA can then shift its focus to designing the best regulatory supplements to such legislation, as explored in Chapter Seven. Some of those same supplements may also be added to any of EPA's own regulatory approaches.

## EPA's Best Strategies

As the following flowchart illustrates, despite the legal complexities explored in Part One, EPA's optimal regulatory strategy is relatively straightforward. By utilizing all of its best tools to comply with mandatory obligations and to achieve environmental goals, EPA can design a regulatory response that will minimize inefficiencies and potential conflicts in case Congress acts. In the meantime, that same strategy will help EPA begin to approach the urgent problem of climate change both responsibly and without delay.

## Flowchart of EPA's Options



# Chapter Four

## Cap-and-Trade Is the Best Strategy

The appropriateness and rationality of any climate change strategy can be analyzed along four dimensions:

- **Legality**: Does legal authority exist to exercise the regulatory option?
- **Effectiveness**: What environmental gains can the regulatory approach achieve? Since climate change is ultimately a global problem demanding a global solution, can the regulatory program fit into and advance international negotiations?
- **Efficiency**: Will the regulation minimize administrative burdens and compliance costs?
- **Fairness**: Will the benefits and burdens of the program be fairly distributed?

This Chapter concludes that “cap-and-trade” is the best and, very likely, the inevitable regulatory design for a comprehensive climate change strategy. EPA should therefore anticipate the existence of such a system when identifying its regulatory options, and the agency should select regulations that will either create, supplement, or—at the very least—not undermine such a system.

Section A of this chapter explains why capping and auctioning off tradable emissions permits is the most efficient regulatory approach to reducing greenhouse gas emissions. The section surveys some of the key features of a cap-and-trade system, including the distributional fairness of various schemes for auctioning permits and distributing revenue.

Section B explores the legality of creating a cap-and-trade system, especially whether any constitutional or statutory prohibitions would prevent EPA from using its discretionary authority under the CAA to develop such regulations.

Section C discusses the effectiveness of cap-and-trade with respect to international coordination, particularly the ability of the President to engage in international negotiations independent of the support of Congress.

## A. Cap-and-Trade Is Effective, Efficient, and Fair

Economists nearly all agree that the most efficient way to reduce greenhouse gases is to give individual polluters maximum flexibility while still insisting on tight economy-wide emissions reductions.<sup>466</sup> A cap-and-trade system achieves these goals by mandating a total cut in emissions but allowing businesses to achieve those reductions in the cheapest manner possible. Generally, such a system caps the nation's total emissions and distributes a limited number of permits to emit greenhouse gas pollution. Polluters can buy and sell permits with each other, thereby letting the marketplace identify the most efficient allocation.

### A.1. Comparison with Alternatives

Historically, environmental regulations have most often followed the “command-and-control” model.<sup>467</sup> That category encompasses any equipment or design standard, any work or operational standard, and any performance standard or emissions limitation. Command-and-control requires every regulated source to comply with a specific standard, and it often prescribes exactly how those standards must be met. In contrast, market-based regulatory mechanisms, such as an emissions tax or a system of tradable permits, let the market identify the most cost-efficient way to reduce overall emissions and do not restrict the options of individual sources.

In many situations—including the control of air pollutants like greenhouse gases—command-and-control regulations are less efficient than market-based controls:

Market-based regulation can attain aggregate emission reductions equivalent to those produced by a command-and-control regime, while at the same time giving companies the flexibility to follow least-cost abatement strategies. As Professor Robert Stavins has observed, market-based instruments induce firms to choose control levels, for each source, at which their marginal abatement costs are the same, thus minimizing overall pollution abatement costs. He explains: “Because the costs of controlling pollution vary greatly among and within firms, any given aggregate pollution control level can be met at minimum aggregate control cost only if pollution sources control at the same *marginal cost*, as opposed to the same *emission level*. Indeed, depending on the age and location of emission sources and available technologies, the cost of controlling a unit of a given pollutant may vary by a factor of one hundred or more among sources.”<sup>468</sup>

Market-based regulations also tend to be more transparent and less complex than command-and-control systems.

Among market-based regulations, a cap-and-trade method offers clear benefits for climate change regulation. It is the most effective mechanism for actually limiting the amount of pollution released into the atmosphere. No other tool is able to deliver the same predictable reductions in greenhouse gases. Other market-based regulatory options, like an emissions tax, cannot guarantee a precise reduction in emissions. A tax holds steady the price polluters must pay to emit a given amount of greenhouse gases: polluters can choose to invest in ways to reduce their emissions so they pay less, or they can choose to bear the cost of the tax and continue business as usual. As a result, using a tax makes it impossible to know in advance what quantity of greenhouse gases will be emitted, while a cap-and-trade approach reduces uncertainty about overall emissions.

Most analysts further believe that an emissions tax to regulate greenhouse gas emissions is politically untenable in the United States. Thus, in the recent frenzy of legislative proposals on climate change, cap-and-trade has emerged as Congress's preferred design choice.<sup>469</sup> If Congress eventually acts on climate change, EPA should expect the legislation to include a cap-and-trade program. International negotiations have also focused on how to let countries take advantage of

efficient opportunities to trade international emissions permits, and some trading elements will likely feature in any climate treaty the United States enters.<sup>470</sup>

EPA should also try to implement a cap-and-trade approach where possible. When the CAA gives EPA regulatory discretion, the agency frequently uses cost-benefit analysis to determine how

best to exercise its authority. Under Executive Orders that have been in place for nearly thirty years, all major regulatory actions are subjected to cost-benefit analysis, unless specifically prohibited by statute.<sup>471</sup> Although the use of cost-benefit analysis is prohibited in some areas of the CAA,<sup>472</sup> many other provisions permit or even require EPA to consider costs, benefits, and efficiencies.<sup>473</sup> Given the mandate of the Executive Orders and general principles of sound decisionmaking, EPA should endeavor to find regulatory options that maximize the benefits of greenhouse gas reductions while minimizing the costs imposed. Cap-and-trade is the optimal solution to meet those criteria.

Various design features will affect the stringency, scope, and distributional equity of a cap-and-trade system. But in general, **compared to command-and-control, cap-and-trade is the superior regulatory strategy.**

## **A.2. Stringency and Scope**

“Cap-and-trade” refers to a general regulatory approach, but there are many variable design features that will impact the overall effectiveness, efficiency, and fairness of the system:

- ***Stringency of the emissions target:*** Cap-and-trade proposals set an annual “cap” on total GHG emissions. The cap limits the number of emissions permits distributed to polluters, thereby restricting the amount of greenhouse gases that polluters are allowed to emit. The cap is steadily decreased over time to cut emissions gradually until the optimal target is reached. Many, including President Obama and some congressional leaders, believe science dictates that emissions must be cut at least 80% by the year 2050 (compared to a 2005 baseline of emissions).<sup>474</sup> Others counter that such deep cuts are perhaps unattainable and unnecessarily strict.<sup>475</sup>
- ***Compliance Date:*** Most proposals set an initial lead time to let polluters make adjustments and prepare for regulation. For example, were Congress to adopt climate legislation in late 2009, most likely the first annual emissions cap would not be set until 2012 or later.
- ***Coverage of greenhouse gases:*** Cap-and-trade proposals typically concentrate on the six main greenhouse gases: carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, perfluorocarbons, and hydrofluorocarbons. Each pollutant is usually measured in “carbon dioxide-equivalent units” based on its relative global warming potential. This approach allows a single cap to be set for all GHGs by limiting total emissions of carbon dioxide-equivalent tons.
- ***Coverage of sectors:*** Many proposals that claim to be “economy-wide” in fact do not cover all GHG emissions. Typically, the main focus is on the production and consumption of fossil fuels for energy. For example, importers and processors of natural gas or petroleum, coal mines, large fossil fuel-fired power plants, or other consumers of fossil fuel energy could be regulated. The manufacture and sale of specific GHGs for commercial or industrial use, such as hydrofluorocarbons, may also be included in the scope of coverage. On the other hand,



very often cap-and-trade proposals do not cover the GHG emissions of agricultural activities, landfills, certain industrial processes, or small sources.

- **Point of regulation:** Many plans call for “upstream” regulation of fossil fuel emissions, by for example, targeting those economic actors that import or produce the fuel; others believe a “downstream” approach, targeting the fossil fuel consumers rather than producers, creates stronger incentives for emitters to change their behavior or technology.<sup>476</sup>

### **A.3. Distributional Equity of the Auction**

How emissions allowances are distributed to polluters is crucial for the issue of fairness. Should any permits be freely given away, or must polluters pay for all their allowances by purchasing them in an auction? Some legislative cap-and-trade proposals do not plan to auction off all emissions allowances, believing certain free allocations are necessary to protect key American businesses from compliance costs that might hurt their competitiveness in the global market.<sup>477</sup> However, economists have found that these give-aways result in wealth transfers to the shareholders of utility companies, but offer little benefit to consumers.<sup>478</sup>

As soon as an emissions cap is put in place, the cost of electricity and energy-intensive goods will rise, creating a price signal across the economy to save energy and move to cleaner technologies like wind and solar. This effect will take place regardless of how permits are distributed, because utility companies will account for the market value of the permits, not the purchase price. The following analogy paints a clear picture: “A ticket scalper is going to charge the same amount—the going black-market price—whether he’s selling a ticket that he found on the ground or a ticket that he bought. He’s just going to turn more of a profit if he found it on the ground.”<sup>479</sup>

Consumers would lose in a permit give-away system, and energy companies would reap windfall profits. Without auctions, the prices go up but no revenue is generated with which lower- and middle-income Americans can be reimbursed for price increases.

Indeed, a total auction of emissions allowances will generate substantial revenue: some estimates top \$100 billion per year. Should those funds be spent or distributed to the American public? In order to avoid regressive effects from an emissions cap, the funds raised from the auction should be returned directly to the American public. Any other use for the revenue will hurt lower- and middle-income Americans.<sup>480</sup>

When an emissions cap is put in place, the per-kilowatt price of electricity will rise as fossil fuel use becomes more expensive. Many consumers are likely to see increases on their bills as a consequence. Energy-intensive manufacturers will have to raise their prices as well, making some goods more expensive. But this will not affect everyone equally: lower- and middle-income households spend a larger percentage of their income on energy. Because they spend more of their income on energy, the effects of an emissions cap are felt most keenly at the bottom side of the income scale—the same groups that can least afford the cost.

By distributing all auction revenue to the American public on a per capita basis, studies show that most Americans immediately come out ahead under a cap-and-trade system.<sup>481</sup> The increased price for fossil-fuel energy is offset by the revenues that are generated by the auction. Thus, a full auction with revenue distribution is the fairest design for cap-and-trade, ensuring that benefits and burdens are allocated appropriately.

Recognizing the fairness of distributing auction revenue to the public, President Obama has voiced this policy preference.<sup>482</sup>

## B. Regulatory Cap-and-Trade Is Legal

Proponents of cap-and-trade often assume that congressional legislation offers the only vehicle for a comprehensive approach to greenhouse gas emissions. However, EPA may in fact be able to design an effective, efficient, and fair cap-and-trade system using its existing authorities from the Clean Air Act.<sup>483</sup> The threshold question is whether any constitutional or statutory impediments would bar EPA from deploying broad market-based regulations.

### **B.1. An Auction Is Not An Illegal Tax**

Courts have sometimes struggled to differentiate illegal regulatory *taxes* from permissible regulatory *fees*.<sup>484</sup> Under the U.S. Constitution, only Congress has the power to levy taxes,<sup>485</sup> which are generally defined to include payments imposed on many citizens to raise money for a public purpose. In contrast, agencies may have statutory or inherent authority to create regulatory fees,<sup>486</sup> which include payments made voluntarily by some individuals for a service provided by the agency, in order to defray the expenses of that service.<sup>487</sup> An auction of emissions permits would not fit neatly into either category, but some might argue it resembles a tax: it will likely affect a large number of citizens, it could be considered involuntary,<sup>488</sup> and the funds generated will exceed EPA's administrative expenses.

However, an auction of emissions credits is not a tax because the purpose of the auction is not to raise revenue. Neither is it truly a regulatory fee, intended only to cover EPA's expenses.<sup>489</sup> Rather, the auction is simply regulation: the fee "serve[s] regulatory purposes directly by . . . deliberately discouraging particular conduct by making it more expensive."<sup>490</sup> Whether explicitly or implicitly authorized by Congress, an emissions auction poses no constitutional problems.<sup>491</sup>

### **B.2. Any Negative Inference Is Limited**

Most statutory provisions of the CAA that EPA could use to create a cap-and-trade system for GHG emissions do not explicitly grant EPA such authority. Relying on an implicit and general grant of regulatory authority to institute a cap-and-trade system is potentially complicated by the explicit approval of market-based regulation in other sections of the CAA. For example:<sup>492</sup>

- Section 110(a)(2)(A) authorizes state governments to develop NAAQS implementation plans that include "enforceable emission limitations and *other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights)*, as well as schedules and timetables for compliance, as may be necessary or appropriate to meet the applicable requirements of this Act."
  - Section 172 uses nearly the same language with respect to states' implementation plans for non-attainment new source review.
  - Section 302 grants EPA authority to use a similar range of market-based regulatory tools (all except for fees) when constructing a federal implementation plan.<sup>493</sup>
- Section 174(e)(4) allows a New Source Review permitting authority to "impose an *emissions fee*" in lieu of offset requirements for the firing of rocket engines or motors.
- Section 183(e)(4) instructs EPA to develop regulations for the "*control of [ozone] emissions from certain sources,*" including "any system or systems of regulation as the Administrator may deem appropriate, including requirements for registration and labeling, self-monitoring and reporting, prohibitions, limitations, or *economic incentives (including*

*marketable permits and auctions of emissions rights*) concerning the manufacture, processing, distribution, use, consumption, or disposal of the product.”

- Section 182 also allows states and EPA to use “economic incentive programs” in serious and severe areas of ozone non-attainment.
- Section 211(m)(5) instructs EPA to develop guidelines on “the use of *marketable* oxygen credits from gasoline.”
- Title IV explicitly creates a cap-and-trade program for “acid deposition *control*”—more commonly known as the acid rain program.<sup>494</sup>
- Title V authorizes the collection of permit fees.

Since Congress knew how to draft the CAA to grant explicit permission for trading and general economic incentives, congressional silence in other provisions may be interpreted as tacit disapproval. Key sections such as 111, 202, and 615 instruct EPA to develop “performance standards,” “emissions standards,” or “controls,” but they do not mention any economic incentives.

A closer look at the language in Section 110(a)(2) suggests that Congress may have considered cap-and-trade programs to be distinct from typical emissions standards and limitations. That section provides:

Each [State Implementation Plan] shall—(A) include enforceable emission limitations *and* other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auctions of emissions rights) . . .

This language implicitly sets “enforceable emissions limitations” apart from “other control measures, means, or techniques,” with only the latter category including “marketable permits” and “auctions of emissions rights.” Thus, any provisions instructing EPA to set emissions standards may not authorize EPA to implement a cap-and-trade system. On the other hand, provisions referencing the use of “controls” tend to permit economic incentives (such as Section 183(e)(4) and Title IV in the examples listed above, as well as Section 110(a)(2)).

Legislative history also could imply that the traditional terms “emissions standards” and “performance standards” permit only command-and-control regulations. In the 1977 Amendments to the CAA, Congress added Section 405 (which was later replaced in 1990). That section directed the White House Council on Environmental Quality to study the effectiveness of using economic incentives to supplement more traditional regulatory approaches.<sup>495</sup> As the House Committee Report explained:

“It cannot be seriously argued that the use of economic incentives to regulation pollution [was] a novel or strange idea that could not have been anticipated by the authors of the CAA Amendments.”

—Justice Department Memorandum, 1989

The 1970 Clean Air Act based its strategy for air pollution control almost exclusively on a regulatory model. That is, the Act provided for the promulgation of regulations containing mandatory standards, requirements, and deadlines for compliance. . . . While the regulatory measures adopted in the 1970 Amendments were of significant value . . . , they lacked, by and large, more direct economic incentives for prompt and continuous compliance (such as emission charges). Moreover, absent such emission charges (or other economic incentives),

the Act did not contain adequate measures to assure the internalization of environmental costs.<sup>496</sup>

Section 405 could imply that, in 1977, Congress thought most existing CAA provisions—including performance standards under Section 111 and emissions standards under Section 202<sup>497</sup>—did not authorize the use of economic incentives. On the other hand, amendments and additions to the CAA made in 1977 or 1990 might not be subject to that same limited interpretation.

Generally, a court will not apply the canon of negative inference unless it is “confident” that Congress likely considered and intended to preclude the unmentioned options in that specific context.<sup>498</sup> Starting in 1977, “[i]t cannot be seriously argued that the use of economic incentives to regulate pollution [was] a novel or strange idea that could not have been anticipated by the authors of the CAA Amendments.”<sup>499</sup> Congress was also definitely aware that referencing certain economic incentives in one provision could accidentally imply a limitation of such incentives in another provision, and at least once Congress modified the proposed statutory amendments to avoid that result.<sup>500</sup>

At the same time, the legislative history and statutory structure of the CAA rarely reveal a congressional intent to constrain EPA’s flexibility in designing the most appropriate regulations. For example, even when Congress refused to grant EPA the power to issue emissions fees as part of a federal implementation plan, fearing that such “fees” were actually undesirable and involuntary “taxes” designed to modify behavior, Congress did not object to granting EPA the power to create either marketable permits or auctions under that same provision.<sup>501</sup> In 1989, the Department of Justice argued that, since economic incentives had become such an obvious regulatory strategy, if Congress “did not prohibit them” and “instead used general language permitting a wide scope of regulatory measures,” no negative inference against market-based regulations should apply.<sup>502</sup>

Ultimately, while EPA’s authority to design a market-based scheme under a general grant of authority may be somewhat “murky” and “speculative,”<sup>503</sup> it seems unlikely that a court could be truly “confident” in applying a negative inference against trading.<sup>504</sup> The argument for a negative inference will be strongest where the provision dates back to the original 1970 language, where EPA is instructed to issue “emissions standards” or “performance standards,” and where legislative history does not reveal a congressional intent to grant sweeping and flexible authority. The argument will be weakest where the provision was modified or added after 1970, where EPA is instructed to issue “controls,” and where Congress clearly expressed a desire to give EPA flexibility.

### **B.3. Statutory Limitations**

While the CAA does not generally preclude cap-and-trade, specific statutory constraints will apply. To create a cap-and-trade program under an implicit grant of statutory authority, EPA will have to demonstrate that the scheme qualifies as the type of regulatory standard that a particular statutory provision authorizes. Some provisions of the CAA may specify that EPA’s regulatory standard must achieve actual emissions reductions from every individual source covered by the regulation. Unfortunately, a cap-and-trade program cannot guarantee such a result, since that program would allow sources to choose to buy enough emissions permits to continue or even increase their pollution output. EPA can interpret statutory language creatively, but the agency cannot stretch beyond reasonable interpretations. A cap-and-trade approach simply may not be consistent with certain statutory requirements.

Other provisions grant EPA broader authority, including implementing a cap-and-trade system and even auctioning off all emissions allowances. The fairest way to allocate auction revenue is by per capita distribution. Regrettably, EPA will not have that option if the agency directly collects the

auction revenue.<sup>505</sup> Under statutory command, the vast majority of the revenue generated by an EPA auction must be deposited directly into the general treasury of the United States.<sup>506</sup> While EPA may be permitted to keep enough to cover its administrative expenses of running the auction,<sup>507</sup> EPA could not dispose of the rest of the money as it saw fit. Instead, EPA would have to wait for Congress to direct the funds from the treasury back to the American public. A few statutory provisions may allow EPA to partner with state governments in the administration of an auction, which might give EPA more flexibility to direct the distribution of revenue.

The specific language found in CAA provisions EPA could best use to create a cap-and-trade system, will be explored in the next Chapter.

### **C. Effective International Coordination without Congress**

Because emissions of greenhouse gases are a global problem, for any domestic cap-and-trade system to be ultimately successful in significantly mitigating climate change, it must be supplemented by an international regime that covers all major emitting nations. A core determinant of the effectiveness of a domestic regulatory cap-and-trade system, then, will be how well it can be integrated into an international climate change regime. In particular, can EPA and the President use existing authority under the CAA to implement an international agreement, without any additional congressional approval?

International agreements “create law for the states parties thereto.”<sup>508</sup> This means that whenever an appropriately designated representative of a country enters an international agreement, that country makes a binding legal commitment to adhere to its terms and provisions. If the country fails to meet those obligations, it has violated a legal duty.

In international law, whether a country’s internal domestic processes for concluding an international agreement were properly followed largely does not bear on whether the agreement is binding:

A State may not invoke the fact that its consent to be bound by a treaty has been expressed in violation of a provision of its internal law regarding competence to conclude treaties as invalidating its consent unless that violation was manifest and concerned a rule of its internal law of fundamental importance.<sup>509</sup>

In addition, it is clear that the President is an authorized representative of the United States and has the power to making binding agreements.<sup>510</sup> As a matter of *international* law, then, it is clear that the President, acting alone, can create binding obligations.

Domestic law, however, is another matter. The United States Foreign Affairs Manual gives three constitutional sources for the power to making international agreements: treaty; legislation; and the constitutional authority of the President.<sup>511</sup>

Under Article II of the U.S. Constitution, the President “shall have power, by and with the advice and consent of the Senate, to make treaties, provided two thirds of the Senators present concur.”<sup>512</sup> The President’s power to negotiate treaties, and the Senate’s power to ratify them, provides the surest grounding in domestic constitutional law to conclude international agreements.

However, as a practical matter, it is often very difficult to secure a two-thirds majority of the Senate for any proposition. The Senate is busy; even the mere act of voting on every international agreement would become burdensome for the Senate; and a requirement for a Senate vote would severely interfere with the carrying out of U.S. foreign relations. In addition, because of the non-egalitarian form of representation in the Senate, Senators representing a relatively small population

can effectively stop treaty-making. In fact, Senators representing well less than 10% of the U.S. population can block the successful ratification of a treaty.

Because of the practical difficulty of completing the formal treaty ratification process, the United States has relied more heavily on “executive agreements” as the preferred form of making international commitments. Currently, only around 6% of the United States’ international commitments take the form of treaties.<sup>513</sup> The vast majority instead take the form of “legislative-executive agreements” or “sole executive agreements.”<sup>514</sup>

An agreement pursuant to legislation—or what has come to be called a “legislative-executive agreement”—is one in which the President “conclude[s] an international agreement on the basis of existing legislation, or subject to legislation to be adopted by the Congress, or upon the failure of Congress to adopt a disapproving joint or concurrent resolution within designated time periods.”<sup>515</sup> There is little question that a legislative-executive agreement that integrated the United States into a global climate change regime would be legitimate under domestic law—Congress would simply adopt any necessary provisions of the treaty into domestic law. Whether an existing provision in the CAA could provide the basis for a legislative-executive agreement will depend on specific statutory context.

The President also has the power to make international agreements unilaterally, but it is widely recognized that those agreements must fall within an area of his constitutional authority. The Foreign Affairs Manual lists the following as “constitutional sources of authority for the President to conclude international agreements”:

- (1) The President's authority as Chief Executive to represent the nation in foreign affairs;
- (2) The President's authority to receive ambassadors and other public ministers, and to recognize foreign governments;
- (3) The President's authority as “Commander-in-Chief”; and
- (4) The President's authority to “take care that the laws be faithfully executed.”<sup>516</sup>

While the scope of these constitutional bases for the President’s authority to conclude sole executive agreements is a source of debate among international law scholars,<sup>517</sup> it is widely recognized that “[a] sole executive agreement made by the President on his own constitutional authority is the law of the land.<sup>518</sup>” The President’s authority to conclude such agreements may be stronger in certain statutory contexts than in other.

Generally, the potential exists for the President to negotiate an international agreement and instruct EPA to implement it, using only existing authority under the CAA and requiring no additional approval from Congress. The ultimate success of this strategy will depend on specific statutory context. Unfortunately, the President has little ability to bind future presidential administrations: any regulatory actions taken under the CAA can be undone by subsequent regulation. The practical long-term effect of an international agreement made under the unilateral authority of the President, then, would depend on the willingness of successor administrations to adhere to his commitments. Therefore, an international treaty ratified by the Senate remains the clearest and most permanent route to

Senate ratification of a treaty is not the only option for concluding an international agreement. The President can utilize independent constitutional authorities and existing legislative authorities to engage in global climate change negotiations, **regardless of whether Congress is ready to support the resulting international agreement.**

international cooperation on climate change. Nevertheless, the CAA may give the President and EPA some ability to move forward with international climate negotiations regardless of whether Congress is prepared to support a resulting agreement.

In broad strokes, EPA has the legal ability to design a cap-and-trade system, auction off emissions allowances, and implement international accords. The next chapter turns to the specific means for accomplishing this result and developing the most effective, efficient, and fair regulatory option available to EPA: the cap-and-trade.

# Chapter Five

## Best Options for Replicating Cap-and-Trade

This Chapter addresses whether EPA can design a comprehensive cap-and-trade scheme, under specific provisions of the Clean Air Act, capable of achieving the necessary environmental benefits with the same cost-efficiency and distributional fairness as new climate change legislation. The answer is that EPA may be able to approximate the scope and environmental gains of potential legislation by constructing its own cap-and-trade program entirely under existing authority from the CAA; but such a system would ultimately fall short of achieving the same efficiency and fairness that new legislation could ensure. Yet until Congress is ready to legislate, this alternative approach could offer the next-best option for combating climate change. Moreover, EPA's regulatory efforts could lay the groundwork for future climate legislation.

Again, the viability of various proposals will be analyzed along four dimensions:

- **Legality**: Would a cap-and-trade arrangement satisfy the statutory requirements?
- **Effectiveness**: Can EPA construct an economy-wide program addressing all main greenhouse gas emissions, either under a single provision or by integrating multiple provisions? Can the regulatory program fit into and advance international negotiations?
- **Efficiency**: Will the administrative burdens and compliance costs be efficiently distributed?
- **Fairness**: Will the benefits and burdens of the program be fairly distributed? Will the regulatory structure be created through a transparent and democratic process?

This Chapter examines EPA's regulatory options along those four dimensions. Section A outlines EPA's single best option: stratospheric controls under Title VI. Section B explains that, since Title VI may not be immediately available, EPA should swiftly act to implement a vehicle fuel trading program. If Title VI then proves unworkable, EPA should supplement the vehicle trading program with trading under either NAAQS or NSPS, described in Sections C and D, respectively. Importantly, regardless of which provision EPA chooses to act under, the overall efficiency of the resulting program will be partially undermined by some of EPA's other statutory obligations. Chapter Six



will offer tactics for minimizing that incompatibility and preserving the integrity of an EPA cap-and-trade program.

## **A. Title VI Stratospheric Controls**

Title VI of the CAA provides EPA with sufficient authority to create a legal and effective cap-and-trade system, broad in its scope and consistent with international negotiations. Section 617 is slightly better than Section 615, because no endangerment finding is required before it can be invoked, because it offers more explicit authority to coordinate internationally, and because it gives EPA an even broader scope of regulatory powers; that said, the two provisions can also be used in conjunction. Unfortunately, some of EPA's statutory obligations under various other provisions of the CAA will undermine the cap-and-trade system's efficiency, and EPA's options for distributing the benefits and burdens of its emissions allowance auction are limited.

### **A.1. Legality of Using Section 615**

Title VI contains two rather broad grants of authority. The first is Section 615, which states:

If, in the Administrator's judgment, any substance, practice, process, or activity may reasonably be anticipated to affect the stratosphere, especially ozone in the stratosphere, and such effect may reasonably be anticipated to endanger public health or welfare, the Administrator shall promptly promulgate regulations respecting the *control of such substance, practice, process, or activity*, and shall submit notice of the proposal and promulgation of such regulation to the Congress.

As explained in Chapter 4, the use of the word "control" is notable because it is not explicitly defined in the Act and, thus, is open to EPA's reasonable statutory interpretation; it is potentially distinct from the more limited term "emissions standard"; and it is regularly employed by Congress when granting EPA explicit authority to use economic incentives.

Congress added Section 615 to the CAA in 1990, but the scope of authority granted was specifically based on Section 157(b) of the 1977 amendments.<sup>519</sup> When that section was created in 1977, Congress clearly expressed that it "does not wish to tie the Administrator's hands or confer an authority which is cumbersome or unduly difficult to use, administer, or enforce."<sup>520</sup> Congress went on to explain that the term "'control' may include design standards, work practice standards, *prohibitions and/or such other measures as may be necessary* to assure protection for health and environment."<sup>521</sup> EPA has interpreted the term "control" broadly, and in 1988 EPA promulgated regulations under Section 157(b) developing a tradable system of allowances for ozone-depleting substances that affect the stratosphere.<sup>522</sup>

In 1989, Congress held hearings on whether Section 157(b) gave EPA the authority to auction off emissions allowances. A memorandum submitted by the Department of Justice found that the scope of authority under the section was "sweeping" and further argued that Congress knew about economic incentives and specifically did not prohibit them.<sup>523</sup> At the hearing, Senator Lieberman opined that the conclusions of that memorandum seemed sound but that Congress should make sure EPA's authority was even clearer in future legislation.<sup>524</sup>

Because of this plain statutory language and legislative history, any negative inference against trading is exceedingly weak, and EPA should be able to design an emissions auction using Section 615. Moreover, it is clear Section 615 is an available authority for the regulation of climate change.<sup>525</sup> In a floor statement by two chief sponsors of Title VI, Senators Chafee and Baucus explained:

Human activities that are polluting the atmosphere, affecting the stratosphere, and, as a result, aggravating problems such as global climate change should be regulated by the Administrator under the authority of this section.<sup>526</sup>

The scientific proof to justify invoking Section 615 for greenhouse gases may not yet exist, as explored above in Chapter Three; but this determination is left to EPA's judgment. Congress wanted to build a precautionary standard into EPA's authority under this section, specifically not wanting to "make more stringent the degree of proof which the Administrator must find to promulgate a regulation."<sup>527</sup> If EPA can find reasonable scientific support to apply Section 615 to greenhouse gas emissions, the section will permit the creation of a cap-and-trade program.

## **A.2. Legality of Using Section 617**

Unlike most of the CAA, which instructs EPA or state governments to work on domestic regulation, Section 617 authorizes the President to commit the United States to international environmental standards:

The President shall undertake to enter into international agreements to foster cooperative research which complements studies and research authorized by this title, and to *develop standards and regulations which protect the stratosphere* consistent with regulations applicable within the United States. For these purposes the President through the Secretary of State and the Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs, shall negotiate multilateral treaties, conventions, resolutions, or other agreements, and formulate, present, or support proposals at the United Nations and other appropriate international forums and shall report to the Congress periodically on efforts to arrive at such agreements.

Section 617 also differs from most of the CAA in that it contains no mandatory endangerment finding. For example, the President does not have to wait to enter an international agreement until EPA determines that pollution is affecting the stratosphere and endangering public welfare; instead, the President may pursue completely precautionary regulations to generally "protect the stratosphere." Even in the face of scientific uncertainties about the relationship of greenhouse gases and the stratosphere, so long as there is some probability that emissions of greenhouse gases will affect the stratosphere, then limiting greenhouse gases emissions will reduce the risk to—i.e., protect—the stratosphere.

Such protection can be accomplished through a cap-and-trade system, since the terms "standards" and "regulations" are plainly broad enough to encompass a market-based scheme. Indeed, when Section 617 was added in 1990,<sup>528</sup> Congress knew that EPA was already using open-ended terms like "control" as the basis for trading programs under Title VI. The only potential limitation on the scope of authority granted by those terms is the phrase "consistent with regulations applicable within the United States." Some legislative history suggests that the main purpose of Section 617 was to ensure that international agreements—specifically, the Montreal Protocol on the control of ozone-depleting substances—would be "at least as stringent as the requirements applicable in the United States as a result of this legislation."<sup>529</sup> In other words, Section 617 intended to ensure other countries kept up with the U.S. control schedule for ozone-depleting substances established by the CAA, not to commit the United States to new forms of regulation like a GHG cap-and-trade system.

However, the bulk of legislative history does not support that narrow reading. In a floor statement by two chief sponsors of Title VI, Senators Chafee and Baucus explained that Section 617 required the United States to "add[ ] emission controls" and "requirements" to those already existing under international treaties.<sup>530</sup> Senator Chafee went on to explain the provision was intended to give the

President “guidance *and the latitude* to seek an international accord that is *more stringent*.”<sup>531</sup> Chafee also defined the phrase “regulations applicable in the United States” to include “statutory requirements and prohibitions as well as administratively promulgated regulations.” Finally, Chafee declared:

[W]e are encouraging the development of a program, multilaterally or unilaterally, that goes *beyond the requirements of this Act*. As such, international proposals that are more stringent than this Act shall be deemed consistent with the United States’ program.<sup>532</sup>

In short, Congress wanted to grant the President the flexibility to push beyond the explicit requirements of the CAA and to develop more stringent international standards, including controls and requirements applicable to additional emissions that threatened the stratosphere. Congress deemed that kind of international agreement to be “consistent with regulations applicable within the United States.” Therefore, using Section 617, the President can negotiate an international treaty and commit the United States to new regulations protecting the stratosphere—including the capping and trading of greenhouse gases.

### **A.3. Effectiveness of Using Title VI**

Whether a cap-and-trade program created under Title VI will be as effective as legislation in achieving the necessary environmental gains depends on its scope and stringency. Ability to integrate the program into international negotiations is also crucial to developing an effective global strategy to the problem of climate change.

To mimic the effectiveness of economy-wide cap-and-trade legislation, regulations under Title VI must achieve a similar scope and stringency. The emissions cap set by EPA regulations must sufficiently limit national emissions of all main greenhouse gases. The cap must apply to the various economic sectors and activities responsible for the majority of U.S. emissions.

Should EPA choose to invoke Title VI to regulate greenhouse gases, its regulatory powers would enable the creation of a comprehensive, economy-wide cap-and-trade system. Under Section 615, EPA is not limited to regulating only sources, but instead can also regulate substances, processes, or activities. A trading program under Section 615 could apply to all greenhouse gases (“substances”); could focus upstream on the importation and production of fossil fuels (“processes”); could cover all economic sectors, from agriculture to industry to transportation (“activities”); and could be as stringent as EPA believes necessary to prevent the endangerment of public health and welfare. Section 617 is even broader, allowing the President to adopt any “standard” or “regulation” that will help protect the stratosphere.

To mimic the effectiveness of economy-wide cap-and-trade legislation, regulations under Title VI must achieve a similar scope and stringency. Title VI of the CAA provides EPA with sufficient authority to create a legal and effective cap-and-trade system, broad in its scope and consistent with international negotiations.

Use of these two provisions also fits seamlessly into an independent Presidential effort to conclude international agreements, with no further action or approval from Congress necessary. Although both sections require giving notice to Congress, and so perhaps contemplate coordination, neither requires congressional pre-approval.<sup>533</sup> Section 617 gives explicit authority to the President to enter international agreements, making any agreement concluded pursuant to that section a

straightforward case of a legislative-executive agreement based on existing legislation. That section instructs the President to “negotiate multilateral treaties, conventions, resolutions, or other agreements” that will “develop standards and regulations which protect the stratosphere.” The President can enter into an international climate change treaty and then instruct EPA to use the authority of Section 617—supplemented if necessary by its authority under Section 615—to implement the agreement.

Section 615 alone does not explicitly authorize international negotiations on climate change. However, to the extent Congress implicitly granted EPA authority to construct a cap-and-trade system for domestic GHG emissions under Section 615, the President can enter into international agreements consistent with that existing legislative authority. Moreover, the President can conclude sole executive agreements pursuant to the constitutional duty to “take care that the laws be faithfully executed.” The faithful execution of a cap-and-trade system under Section 615 may require a certain degree of international cooperation. For example, incorporating international emissions credits into any trading and offset features of a domestic cap-and-trade system may be necessary to guarantee the effectiveness and efficiency of the program. Additionally, to prevent leakage, it may be desirable to couple a domestic cap-and-trade system with trade sanctions against countries that have not enacted similar GHG controls. While the President must be careful not to violate any obligations under international trade law, it is notable that EPA has previously used its Section 615 authority to regulate the importation of certain ozone-depleting substances.<sup>534</sup>

#### **A.4. Efficiency and Fairness of Using Title VI**

The cap-and-trade mechanism is itself an efficient regulatory tool. Some debate remains about the most efficient structure for the system, but EPA’s broad authority under Title VI would permit the agency to utilize any of those potential designs. For example, whether EPA believes an upstream- or downstream-oriented cap is more efficient, both options are available under Title VI: Section 615 allows the regulation of both sources (e.g., the downstream consumers of fossil fuel) and processes (e.g., the upstream importation and production of fossil fuel).

Still, the overall efficiency of the cap-and-trade system will be undermined by other statutory obligations, as explored below in Chapter Six. EPA can certainly minimize the inefficiencies by deploying its best regulatory options, but some mandatory command-and-control regulations will ultimately interfere with the cap-and-trade program. Notably, those statutory obligations exist regardless of any action taken under Title VI, and so they should not prevent EPA from pursuing efficient cap-and-trade regulations.

Additionally, agency resources impact whether the program can be administered efficiently. For the most part, EPA has the sole responsibility to implement the CAA. Though the President, as head of the executive branch, may be able to use his authority under Section 617 to distribute some of the administrative burdens of a CAA-based cap-and-trade system among the various executive departments, the initiation of an economy-wide program is sure to tax EPA’s strained resources. If Congress were instead to pass new climate change legislation, it would likely delegate certain responsibilities to other federal agencies—for example, the Departments of Transportation, Energy, and Agriculture. Furthermore, Congress could choose to create new entities and to authorize new appropriations to carry out specific tasks. Such divisions of administrative burdens are not available if EPA operates exclusively under Title VI of the CAA.

Finally, a cap-and-trade program established under Title VI may lack the same distributional fairness, transparency, and legitimacy as new climate legislation. As explained above, a cap-and-trade program based under the CAA will not permit EPA to distribute auction revenue on a per capita basis. A cap-and-trade system developed under Section 615 would likely undergo several

rounds of public comment as the necessary regulations moved through the rulemaking process. However, the opportunity for comment does not provide the public with the same level of democratic control it has over congressional decisions. Should the President act predominantly through Section 617, the ability of the public to comment during international negotiations may be even more limited. The development of a cap-and-trade program will have significant and economy-wide impacts; acting exclusively through regulation lacks the same democratic legitimacy as a legislative process.

## **B. Vehicle Fuel Trading**

Since Title VI may not be immediately available, EPA should swiftly act to implement a vehicle fuel trading program under Section 211. Instituting such a program is well within EPA's discretion, and EPA could likely get the program up and running more quickly than a trading system using Title VI. EPA will be able to cover essentially all mobile source emissions under an effective and efficient cap-and-trade program—with an auction.

### **B.1. Legality of a Vehicle Fuel Cap**

Section 211(c) confers on EPA “broad discretion”<sup>535</sup> to “control or prohibit the manufacture [including importation and refining], introduction into commerce, offering for sale, or sale of any fuel or fuel additive for use in a motor vehicle, motor vehicle engine, or nonroad engine or nonroad vehicle.”

EPA may exercise this regulatory authority after making a positive endangerment finding for GHG emissions from these fuels. As explained in Chapter Two, because combustion of fuel is the primary method by which GHGs are emitted from all mobile sources, the endangerment and contribution analysis for each fuel will be practically identical to the findings EPA will soon finalize for the mobile sources themselves.<sup>536</sup> EPA is therefore authorized, and probably obligated if petitioned, to make endangerment findings for all fuels that emit GHGs when used in mobile sources.

EPA has previously instituted trading programs under Section 211(c)—but trading for credits, not allowances or permits. For example, in 1985 EPA issued regulations setting increasingly stringent standards for the lead content of gasoline.<sup>537</sup> To provide refiners and importers with flexibility during the initial phase-down period, EPA allowed companies to generate “credits” by producing gasoline with lower lead content than the standard required. These credits could then be “banked” for use at a later time as the lead content standards became stricter, or else traded to another company.<sup>538</sup> That company could then use the credits to cover the lead content of its own fuel. Gasoline importers and refiners brought a number of challenges to this regulation, but they never argued that EPA had exceeded its authority under Section 211(c) in creating a trading program.<sup>539</sup> As another more recent example, in 2000 EPA issued the Tier 2 Vehicle and Gasoline Sulfur Program, which set increasingly stringent sulfur content standards for gasoline and allowed a similar trading system for credits.<sup>540</sup>

Although these previous programs did not technically involve a “cap” or “permits” for emissions, the total lead and sulfur content of the fuel sold by each refinery was limited by a standard. A cap system would similarly limit the total carbon content of the fuel sold by each refinery, based on the number of emissions permits held. Such a system is consistent with past EPA practices and with the statutory requirement to “control” the sale of fuel. As noted in Chapter Four, Congress frequently employed the word “control” when granting authority to use market-based regulations. In fact, in 1976 when Congress commented on the general lack of economic incentives created by

the Clean Air Act, Section 211 was the one principal exception cited: “Section 211 authorizes the Administrator to establish [economic] penalties.”<sup>541</sup>

While previous regulations under Section 211 have not involved an auction, they have involved limited trading mechanisms. Given the broad language, statutory structure, and legislative history, nothing in Section 211 should prohibit the institution of a cap-and-trade system, complete with an auction, for fuel sold for use in motor vehicles and nonroad vehicles. And, as explained earlier, the use of the word “control” will allow EPA to institute an auction under this provision.

## **B.2. Effectiveness, Efficiency, and Fairness of a Vehicle Fuel Cap**

In general, the vehicle fuel trading program should prove highly effective and efficient. Petroleum accounts for 99% of the energy used in, and GHG emissions from, the transportation sector.<sup>542</sup> Therefore, a cap-and-trade system for fuels would be able to achieve substantial and comprehensive GHG emission reductions in the transportation sector—which accounts for almost one-third of total U.S. GHG emissions.<sup>543</sup>

The main excluded component under the CAA would be jet fuel, which Section 211 does not reach. Instead, the Federal Aviation Act delegates the ability to regulate jet fuel to the Federal Aviation Administration (FAA). That Act provides that FAA shall prescribe:

(1) standards for the composition or chemical or physical properties of an aircraft fuel or fuel additive to control or eliminate aircraft emissions the Administrator of the Environmental Protection Agency decides under section 231 of the Clean Air Act (42 U.S.C. 7571) endanger the public health or welfare; and

(2) regulations providing for carrying out and enforcing those standards.<sup>544</sup>

As described in Chapter Two, EPA will be required to make an endangerment finding for GHG emissions from aircraft engines. It might be possible for the FAA to design standards that would bring jet fuel into EPA’s fuel trading scheme. Jet fuel’s carbon content and potential to emit GHGs are “chemical or physical properties of an aircraft fuel.” A standard for such properties that would “control” dangerous emissions could include a requirement that all jet fuel sold in the United States be covered by sufficient emissions permits, and FAA could incorporate that system into EPA’s fuel trading program. As an alternative, FAA may be able to use the broad authority granted by the phrase “regulations providing for carrying out and enforcing” to accomplish the same goal.<sup>545</sup>

Covering fuels under a cap-and-trade program will create a disincentive to introduce carbon-heavy fuels into commerce and instead promote innovation in low-carbon fuels as well as innovation in more efficient designs for transportation vehicles.

The cap-and-trade system will operate most efficiently if it targets the upstream importers, refiners, and producers of fuel. Each permit would allow the sale of fuel representing a certain amount of potential GHG emissions. EPA would then cap the total number of permits auctioned off to fuel manufacturers. As with any cap-and-trade system, covered entities would pass along the cost of the allowances to consumers, who will take into account the increased price of gasoline and diesel. Targeting an upstream point in the stream of commerce means that oil

As petroleum accounts for 99% of the greenhouse gas emissions from vehicles, a cap-and-trade system for fuels could achieve **substantial and comprehensive GHG emissions reductions within the transportation sector.**

refineries, fuel importers, and fuel manufacturers will need to buy permits. There are only approximately 150 refineries in this country:<sup>546</sup> keeping the number of regulated entities low will minimize the administrative burdens of the program.

Moreover, refineries are already subject to regulation as stationary sources, as they emit GHGs and other pollutants during the refining process. Therefore, imposing additional regulations will not impose drastically higher administrative costs. Additionally, there are already information-collecting regulations for fuels.<sup>547</sup> A cap-and-trade program could use these data collection processes to identify suppliers of transportation fuels and include them in the cap-and-trade program.

The success of a vehicle fuel cap will be limited by many of the same problems faced by the cap-and-trade suggested under Title VI. In particular, the efficiency of the program will be compromised by EPA's continuing statutory obligations to issue specific mobile and stationary source regulations under various provisions of the CAA. Also, as with the cap-and-trade system under Title VI, EPA's vehicle fuel program could include a complete auction of allowances, but EPA could not distribute revenue on a per capita basis.

Thus, within the context of the transportation section, a vehicle fuel cap-and-trade program will be relatively efficient and effective. However, to create a comprehensive approach to climate change, EPA must combine the vehicle fuel program with some regulation of stationary sources. NAAQS or NSPS offer the best potential to include stationary sources in a cap-and-trade system; other provisions of the CAA are mostly non-starters for the creation of market-based regulation.

## **C. Cap-and-Trade Under NAAQS**

EPA's authority to control dangerous air pollution under Title I is fairly comprehensive, and there is a reasonable probability that EPA can organize a cap-and-trade system using national ambient air quality standards as the starting point. Recall from Chapter Three that EPA might have discretion to list greenhouse gases as criteria pollutants; EPA could even treat all six main GHGs as a single criteria pollutant. Should EPA exercise this option, or should a strict interpretation of statutory requirements mandate this result, EPA will then set national ambient air quality standards (NAAQS) for GHGs under Sections 108 and 109. States are then given primary responsibility by Section 110 for achieving and maintaining those standards within their own borders. If an area has achieved the standard, it is said to be in "attainment"; otherwise, it is in "non-attainment." Depending on the attainment status of a region, states are required by statute to enforce certain controls and regulations, particularly for new and modified major sources.

Compared to EPA's options under Title VI, the design features available under NAAQS could allow EPA to improve the administrative efficiency, distributional fairness, and democratic legitimacy of the cap-and-trade system. Unfortunately, compared to either a Title VI program or new climate legislation, a NAAQS-based program will be less effective and subject to much more legal uncertainty. Most importantly, the overall structure of the NAAQS regime may prove somewhat unworkable as applied to GHGs.

### **C.1. Legality of Cap-and-Trade Under NAAQS**

Few have considered how to build a cap-and-trade program for greenhouse gas emissions under NAAQS, since few think NAAQS is workable for greenhouse gases. However, using NAAQS does have a distinct legal advantage. The NAAQS regime relies primarily on the states for implementation, meaning the full range of legal powers reserved to state governments are

available. In fact, Section 110(a)(2) specifically recognizes that individual states have the ability to use marketable permits and auctions to achieve and maintain NAAQS within their borders. Congress has given EPA similar authority to use economic incentives under its federal implementation plans when a state has failed to submit a sufficient plan of its own. Thus, there is no negative inference against trading under NAAQS.

The legal obstacles to building a successful cap-and-trade under NAAQS are different. Since individual states are responsible for the pollution within their own borders, EPA cannot necessarily dictate policy and require all states to participate in a cap-and-trade program. Therefore, EPA must overcome two obstacles if it wants to create cap-and-trade under NAAQS: (1) how to set a national cap on emissions allowances, and (2) how to ensure states will participate in a national trading program. Fortunately, a few provisions can help EPA resolve these issues.

### **“Air Quality Standards” Cannot Be Emissions Caps**

Under Section 109, EPA sets “air quality standards” for states to achieve and maintain. Historically, such standards have focused on restricting the ambient concentrations of criteria pollutants. Though some legal analysts contend that the Clean Air Act does not strictly require NAAQS to be based on concentrations, it is unlikely EPA could interpret “air quality standard” to allow the creation of a national emissions budget.

The Clean Air Act never defines an “air quality standard.” But the plain language does suggest that the standard should be measured in terms of the air’s quality. When setting the air quality criteria for a pollutant with climate change impacts, the most relevant quality of air is global mean surface temperature.<sup>548</sup> Air temperature is directly proportional to the concentrations of different chemical components in the air,<sup>549</sup> but it cannot readily be measured just by monitoring total emissions.<sup>550</sup>

Perhaps tellingly, while “air quality standard” is not defined in the Clean Air Act, the concept of an emissions quantity limitation is part of the Act’s definition of an “emission standard.”<sup>551</sup> But criteria pollutants are not given “emission standards”; they are given “air quality standards.” Other statutory evidence also indirectly suggests that Congress intended NAAQS to be set as concentration limits.<sup>552</sup>

Of course, EPA would have a certain amount of discretion in defining an ambiguous term like “quality standard.”<sup>553</sup> Yet given the plain language and statutory context of the term, it may be a stretch to prescribe a national emissions budget as the greenhouse gas NAAQS.

### **Interstate Contributions Provide a Poor Basis for Cap-and-Trade**

Section 110(a)(2)(D)(i) requires that states prevent their pollution from contributing to the non-attainment status of another state. That provision is an obvious choice as a foundation for a cap-and-trade system, since EPA has relied on it in the past to create cap-and-trade schemes: successfully in 1998 with a trading program for nitrogen oxides (the “NO<sub>x</sub> SIP Call”),<sup>554</sup> and unsuccessfully in 2005 with the Clean Air Interstate Rule (“CAIR,” which was struck down by the D.C. Circuit in 2008).<sup>555</sup>

Unfavorable case law on CAIR makes using Section 110(a)(2)(D)(i) an imperfect and risky option to address greenhouse gases. That section requires each state implementation plan (“SIP”) to:

contain adequate provisions prohibiting, consistent with the provision of this title, any source or other type of emissions activity within the State from emitting any air pollutant in amounts which will – (I) contribute significantly to nonattainment in, or interfere with maintenance by, any other State with respect to any such national primary or secondary ambient air quality standard.



EPA promulgated CAIR to ensure that upwind sources would not “contribute significantly” to non-attainment in downwind states. Each state was given a specific budget of emissions allowances, calculated based on how much a state could emit before it “contribute[d] significantly.”<sup>556</sup> CAIR set up an optional interstate trading program (mandatory for states without an approved SIP).<sup>557</sup>

CAIR was challenged before the United States Court of Appeals for the District of Columbia on several grounds. While the court did not strike down interstate trading programs per se,<sup>558</sup> it did rule against trading programs in the mold of CAIR. Because CAIR let sources freely purchase credits from other states, a state could ultimately emit more pollution than its cap would otherwise permit.<sup>559</sup> That potential result, the court ruled, undermined the statutory requirement for “something measurable towards the goal of prohibiting sources ‘within the State’ from contributing to nonattainment or interfering with maintenance in ‘any other State.’” In short, “the statute requires each state to prohibit emissions ‘within the State’ that contribute significantly to downwind pollution, not to pay for other states to prohibit their own contributions.”<sup>560</sup>

It might be difficult for EPA to design an effective cap-and-trade program for greenhouse gases within such confines.<sup>561</sup> Requiring each state to guarantee at least some emissions cuts within its own borders could interfere with the efficiency of a national market for emissions credits. The point of a national market is to identify the least-cost reductions first, regardless of which state they occur in.

### **General SIP Requirements as a Basis for the Trading Program**

EPA has explored the possibility that the broad requirement for states to “maintain” NAAQS could allow to EPA to require nationwide cap-and-trade.<sup>562</sup> States are generally required by Section 110(a)(1) to “implement[ ], maint[ain], and enforce[ ]” the air quality standards. Depending on how EPA defines what is adequate to implement and maintain NAAQS, participation in a national cap-and-trade system may be the optimal way for states to comply with these requirements.<sup>563</sup> EPA could present cap-and-trade as an option for states to choose, as it did with the NO<sub>x</sub> SIP Call (and would have done with CAIR, had that rule not been vacated). EPA can also make cap-and-trade part of any federal implementation plan it designs if a state fails to submit an adequate SIP.

However, EPA cannot condition its approval of a SIP upon a state’s participation in the cap-and-trade program.<sup>564</sup> Nor can EPA define the standards for implementing and maintaining NAAQS so narrowly that the only means for states to comply is by participating in the cap-and-trade program.<sup>565</sup> The Clean Air Act “gives [EPA] no authority to question the wisdom of a State’s choices” of control measures in its SIP.<sup>566</sup> States have the “primary responsibility” for “specify[ing] the manner in which [NAAQS] will be achieved and maintained”; EPA’s role is only secondary.<sup>567</sup>

Under the NO<sub>x</sub> SIP Call and CAIR, states had strong motivation to participate in the otherwise voluntary trading programs because EPA had separate authority to set caps on state emissions. Such rules were promulgated under Section 110(a)(2)(D), through which EPA could assign states emissions budgets in order to “project whether states have reduced emissions sufficiently to mitigate interstate transport.”<sup>568</sup> Once a state was subject to a cap, it typically made sense for a state to participate in the voluntary cap-and-trade program. However, EPA likely cannot set similar state caps under Section 110(a)(1). EPA has authority only to set nationwide NAAQS applicable to all states; the statute does not generally permit EPA to layer state-by-state emissions budgets on top of that. Thus, any national cap-and-trade system developed solely under Section 110(a)(1) will be at most optional.

### **International Contributions as a Basis for the Cap**

Section 115 might offer EPA some supplementary authority to encourage state participation in an otherwise voluntary cap-and-trade program. That section states:

(a) Whenever the Administrator . . . has reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country . . . , the Administrator shall give formal notification thereof to the Governor of the State in which such emissions originate. (b) The notice of the Administrator shall be deemed to be a finding under section 110(a)(2)(H)(ii) which requires a plan revision with respect to so much of the applicable implementation plan as is inadequate to prevent or eliminate the endangerment.

The conditions for invoking Section 115, at least with respect to some foreign nations, may already be satisfied for greenhouse gas pollution.<sup>569</sup> Therefore, SIPs may eventually have to contain adequate provisions to prevent or eliminate the potential foreign endangerment caused by climate change. EPA is given discretion to determine when SIPs are inadequate to achieve that goal:

[SIPS must] provide for revision of such plan— . . . whenever the Administrator finds on the basis of information available to the Administrator that the plan is substantially inadequate . . . to otherwise comply with any additional requirements established under this Act.

Unlike Section 110(a)(2)(D)'s focus on individual states' contributions to other states' air quality, Section 115 has a national focus: "pollutants emitted in the United States." The goal of Section 115 is to reduce total U.S. emissions in order to prevent foreign endangerment. Even though this goal will be accomplished through state implementation plans, there is no requirement for any individual state to reduce its emissions.<sup>570</sup>

Thus, EPA may be able to use Section 115 to set state-by-state emissions budgets, copying the basic procedure from Section 110(a)(2)(D). The agency could claim authority to "project whether states have reduced emissions sufficiently to mitigate [international] transport." While EPA still could not specify which control measures states must adopt, Section 115 would let the agency define the total U.S. emissions reductions necessary to "prevent or eliminate the [foreign] endangerment" and apportion that total reduction target into individual state targets. Once states are subject to an emissions cap, a national cap-and-trade program may become the most attractive choice for states.<sup>571</sup>

Thus, a combination of Sections 110(a)(1) and 115 may give EPA the most authority and flexibility to strongly encourage state participation in a national cap-and-trade program.

## **C.2. Effectiveness, Efficiency, and Fairness of Using NAAQS**

If all U.S. states and territories were to participate in a national cap-and-trade program, the resulting structure could be fairly comprehensive. States can use their SIPs to target any pollution sources within their own borders. By implementing the cap-and-trade through the SIPs, states would have the power to include economy-wide sources in the program: stationary and mobile, new and existing, upstream and downstream.<sup>572</sup> Even if NAAQS have been set for greenhouse gases individually rather than as a group, the program should be able to address all six greenhouse gases collectively.

Marketable permits and auctions are among the control techniques specifically available to states under Section 110(a)(2)(A).<sup>573</sup>

EPA may be able to build a comprehensive cap-and-trade strategy under the NAAQS program. Unfortunately, the trading system may only be voluntary on a state-by-state basis, and the overall structure of NAAQS may fit awkwardly with the regulation of GHGs.

EPA could set state emissions budgets and then draft a model rule to design a national trading program. EPA could promise states speedy approval of their SIPs if they adopt the model rule and enter the national program. EPA or some other state-appointed body<sup>574</sup> could administer the program with the necessary flexibility.<sup>575</sup> This division of resources will greatly aid in the efficient administration of the program. Importantly, since states are not under the same obligation as EPA to deposit auction revenues into the general U.S. treasury, EPA could build a direct per capita distribution of auction revenue into its model rule.<sup>576</sup> Finally, because of the public processes involved in the design and promulgation of SIPs, the public would have an opportunity to comment and influence the process, adding to the democratic legitimacy of the endeavor.

Furthermore, if based on Section 115, a trading system under NAAQS could advance international negotiations. While Section 115 does not explicitly grant any new authority to negotiate international treaties (unlike Section 617), it clearly does contemplate a system of reciprocal international rights to combat global pollution. It also encourages international dialogue by requiring the involvement of foreign governments in the SIP revision process. If the President were to enter into an international agreement, EPA could partially implement such promises through its authorities under Section 115 and the rest of the NAAQS regime.

However, getting such a program up and running could take a good deal of time. EPA would have to list greenhouse gases as criteria pollutants, set the criteria, set NAAQS, propose a model national cap-and-trade program, wait for states to adopt such a program through their SIPs, suggest modifications to those SIPs as necessary, and then wait for SIPs to take effect.<sup>577</sup> Under EPA's previous attempts to create voluntary cap-and-trade programs, some states have been hesitant to implement EPA's model rules.<sup>578</sup> The whole process could easily take a decade or more, and would likely have to survive numerous legal challenges along the way (each individual SIP could be challenged).

Most importantly, for a NAAQS-based cap-and-trade to be effective and efficient, EPA must overcome several serious challenges in applying NAAQS to greenhouse gases. The next subsection analyzes these workability issues.

### **C.3. Potential Workability Problems for NAAQS**

Many legal analysts have discussed the practical problems with issuing NAAQS for greenhouse gases, noting that statutory requirements for the implementation of NAAQS may make the regime unworkable for greenhouse gases. However, enough flexibility may in fact be built into the statutory requirements for EPA to construct a workable regulatory program using NAAQS for greenhouse gases.

#### **EPA Must Still Set Concentration Standards**

As discussed above, EPA cannot simply transform its national ambient air quality standards into a cap-and-trade program. While EPA may use Sections 110 and 115 to create state-by-state emissions budgets, Section 109 would still require EPA to set a general concentration standard for GHGs.

NAAQS must be set at levels "requisite to protect public health . . . [and] welfare."<sup>579</sup> Inevitably, EPA will have to set NAAQS below current global concentrations of greenhouse gases. Section 108(a)(2) specifies that criteria "shall *accurately* reflect the *latest* scientific knowledge useful in indicating the kind and effect of all identifiable effects on public health or welfare *which may be expected*." In other words, EPA cannot ignore the latest science and must adopt a precautionary stance. Most scientists concur that current concentrations and projected future concentrations of GHGs are unsustainable.<sup>580</sup> States will then be responsible for developing implementation plans to attain

compliance with such standards set below current global concentrations. However, that could be a near-impossible goal for the states, due to the unique chemical properties of greenhouse gases.

Compared to most criteria pollutants, greenhouse gases are relatively well-mixed and occur in uniform concentrations throughout the global atmosphere. Additionally, greenhouse gases are very long-lived in the atmosphere.<sup>581</sup> And though the United States is a large source of global greenhouse gas emissions, it is not the only source (and indeed is no longer the largest source).<sup>582</sup>

The combination of those three factors complicates the application of the NAAQS regime to greenhouse gases. NAAQS were originally designed to target short-lived pollutants with localized concentrations. If states controlled their own emissions of the pollutants, for the most part they could control the air quality levels within their own borders.<sup>583</sup> But even if a state cut its greenhouse gases emissions down to zero, current concentrations of the greenhouse gases within the state would probably not change. Neither state implementation plans nor EPA can effectively reduce the concentration of already-existing greenhouse gases or the emissions of other countries.

Essentially, the entire country would be in “non-attainment” for any NAAQS set below current global concentrations. Non-attainment status carries several mandatory and harsh penalties. New and modified sources in non-attainment areas are required to adopt more stringent and costly control technologies, and also to obtain offsetting emissions reductions from other sources. Even existing sources may be subject to requirements for installing technological controls. If the area does not reach attainment within the statutorily prescribed deadlines, additional sanctions attach.<sup>584</sup> As described above, no area could realistically achieve the necessary air quality improvements within the allotted time.<sup>585</sup> Applying these harsh penalties to the entire nation is likely to be counterproductive.

Luckily, several creative options for setting NAAQS could make the program more workable than most have predicted.

### **NAAQS Need Only Be “Necessary,” Not “Sufficient”**

According to Section 109, primary NAAQS must be set at the level “requisite to protect the public health,” with “an adequate margin of safety.” Secondary NAAQS must be set at the level “requisite to protect the public welfare,” with precaution for “anticipated [but unknown] adverse effects.” The Supreme Court has adopted the view that “requisite” means “sufficient, but not more than necessary.”<sup>586</sup> Following the Court’s lead, the D.C. Circuit has held that EPA must “set[ ] the NAAQS at whatever level it deems necessary and sufficient.”<sup>587</sup>

But did the courts really mean that NAAQS should be *sufficient* to protect public health and welfare? If NAAQS are to be “sufficient,” then their attainment should be the only thing required to protect the public health and welfare—a high standard.<sup>588</sup>

Yet some risks to public health and welfare lie outside the jurisdiction of the Clean Air Act, and the attainment of NAAQS will never reduce those risks to tolerable levels. For example, the criteria pollutant carbon monoxide has both outdoor sources (e.g., traffic jams) and indoor sources (e.g., tobacco smoke and poorly-vented stoves). EPA recognizes that the public spends a majority of its time indoors, and so indoor sources contribute significantly to total exposure to carbon monoxide. While EPA does set its NAAQS “in the context of total exposure, a major component of which is indoor exposure,” ultimately EPA concedes that indoor sources “cannot be effectively mitigated by ambient air quality standards.” The best EPA can do is set NAAQS such that “in the absence of indoor sources” public health would have been adequately protected.<sup>589</sup> In other words, the carbon monoxide NAAQS is *necessary* to protect public health (i.e., without it, public health could not be protected); but it is not *sufficient* to protect public health (i.e., even under properly calibrated NAAQS, some significant public health risks from carbon monoxide persist).

Indeed, the Senate has expressed this exact understanding of the term “necessary” in the context of greenhouse gases. When the Senate considered regulating greenhouse gases under Title VI in 1990, its Committee Report wrote:

Protection of human health and the environment from the threats of global climate change and destruction of the stratospheric ozone layer ultimately will depend on global action. Nevertheless, unilateral action to strengthen the controls set forth in this Act on domestic production and use of ozone depleting and greenhouse forcing substances may be “necessary to protect human health and the environment,” as that phrase is used in this Act. . . . The fact that such unilateral action may improve the global environmental situation only by a relatively small percentage is irrelevant. Unilateral action may be “necessary” even in instances where such action, without additional international controls, may not be “adequate.”<sup>590</sup>

The NAAQS set for greenhouse gases must be as low as necessary to protect public health and welfare, but given continuing foreign emissions and the existing concentrations of greenhouse gases (which limited jurisdictional authority and the laws of science prevent the Clean Air Act from affecting), the NAAQS may not need to be sufficient to protect public health and welfare.<sup>591</sup>

### **NAAQS Can Be Set for Ground-Level Concentrations**

The global atmospheric concentration of carbon dioxide reached approximately 379 parts per million (ppm) in 2005.<sup>592</sup> This figure represents the relatively uniform and average concentration of carbon dioxide in the stratosphere. But when measured closer to the ground, carbon dioxide concentrations are much more variable and responsive to local conditions. Landmark studies carried out in the city of Phoenix, Arizona demonstrated that, when readings were taken two meters off the ground, carbon dioxide concentrations ranged from a high of 555 ppm at the city’s center to the background average of 370 ppm in outlying rural areas.<sup>593</sup> Additionally, the researchers found a 22-40 ppm differential between weekday and weekend readings, showing how responsive the concentrations are to variables like transportation patterns.<sup>594</sup>

Similar urban and suburban “carbon dioxide domes” have been documented across the globe: Salt Lake City, Utah; Baltimore, Maryland; Melbourne, Australia; Cotonou, Benin (West Africa); Tokyo, Japan; Mexico City, Mexico; Rome, Italy; Krakow, Poland; Paris, France; Copenhagen, Denmark; and Kuwait City, Kuwait.<sup>595</sup> Researchers have found the effect to be largely independent of temperature, humidity, or wind conditions.

Assuming these empirical observations are correct, it is conceivable that NAAQS set *above global* average concentrations of carbon dioxide *but below urban* concentrations of carbon dioxide would be adequate to protect public health and welfare.<sup>596</sup> Such air quality standards might place most urban and suburban areas of the country in nonattainment, but many rural areas would be in attainment. This would avoid the draconian result of placing the entire country into non-attainment. More importantly, states would be able to enact policies capable of moving non-attainment areas toward attainment. For example, changes in transportation patterns may, according to previous studies, achieve a 22-40 ppm drop for city-center concentrations. Even though global concentrations at high altitudes may not change, states could achieve reasonable NAAQS for ground-level concentrations.

Such a standard would be “requisite” to protect public health and welfare in the sense of being necessary but not sufficient. While lowering carbon dioxide concentrations in urban and suburban areas will not by itself automatically stave off global warming, it is a necessary step to achieve that outcome. But that outcome will also require the reduction of foreign emissions and a good deal of

time for the already existing pollutants to break down, both of which are outside the jurisdiction of the Clean Air Act.

It is unclear whether non-CO<sub>2</sub> greenhouse gases behave the same way, so the usefulness of this approach may be limited to carbon dioxide. Additional research would also be necessary to confirm the effect more broadly nationwide and to check whether geography or weather patterns unfairly affect certain regions.

### **NAAQS Need Not Be Set At Pre-Industrial Levels**

Some have suggested that only by returning to pre-industrial concentrations of GHGs can climate change be averted.<sup>597</sup> Exactly what level of air quality is necessary to protect public health and welfare from the consequences of climate change is largely a scientific determination, and EPA's experts will have considerable discretion to exercise their judgment in setting the standards.<sup>598</sup> However, some legal requirements will guide their choice.

In *Whitman v. American Trucking*, the Supreme Court stated that, when setting primary NAAQS, EPA must "identify the maximum airborne concentration of a pollutant that the public health can *tolerate*, decrease the concentration to provide an '*adequate*' margin of safety, and set the standard at that level."<sup>599</sup> But what degree of health and welfare effects can the public "tolerate"? Justice Breyer's concurrence in *Whitman* provides some additional guidance.<sup>600</sup> Breyer clarified that the standards did not need to describe a risk-free world, since such a goal is "impossible and undesirable."<sup>601</sup> In particular, Breyer noted that EPA retained "considerable discretionary standard-setting authority" and could consider such factors as background risks; the severity, frequency, and distribution of adverse events; uncertainties; and context.

Even though EPA cannot consider cost when setting NAAQS,<sup>602</sup> the discretion afforded to the agency under the Act means that EPA need not set NAAQS at pre-industrial concentrations of GHGs in order to eliminate all potential harms from anthropogenic climate change.<sup>603</sup> When setting NAAQS, EPA can consider the background risks inherent in the climate system and in modern industrial life. Moreover, the agency can disregard certain adverse occurrences if they are trivial, rare, or unlikely to occur. Using such discretion, EPA will not be required to set NAAQS at pre-industrial concentrations.

### **EPA Can Choose To Set Only A Secondary NAAQS**

Several commentators and EPA's ANPR raised the possibility of foregoing a primary NAAQS (to protect "public health") and setting only a secondary NAAQS for greenhouse gases (to protect "public welfare"). Direct exposure to current concentrations of greenhouse gases has no known adverse effects on human health.<sup>604</sup> Instead, most of the potential human health effects due to climate change are the result of environmental effects: for example, increased temperature and changing weather patterns may expand the range of tropical diseases and epidemics, contribute to more cases of heat stroke and cardiovascular disease, and even raise the incidence of kidney stones and respiratory illnesses.<sup>605</sup> If the secondary, welfare-focused NAAQS solve the temperature and weather problems, then primary, health-focused NAAQS may be at best redundant. Not having primary air quality standards for greenhouse gases could make imposition of the NAAQS system more workable. The penalties for not attaining secondary NAAQS are less severe than those for not attaining primary NAAQS, in particular with respect to deadlines for compliance.<sup>606</sup>

Statutory evidence strongly suggests EPA may forego setting either the primary or secondary NAAQS for a criteria pollutant if such standards are truly not "requisite" to protect the public health or welfare.<sup>607</sup> The question is: do the indirect health consequences of climate change count as effects on public health or on public welfare? In its recently proposed endangerment finding, EPA has opted to include indirect health effects as part of "public health."<sup>608</sup> On the other hand,

statutory structure and legislative history could support restricting “public health” to mean only effects from direct exposure, and instead include indirect health effects under “public welfare.”<sup>609</sup> EPA might want to consider the potential benefits of this strategy if it explores using NAAQS for GHGs.

A trading program using NSPS is feasible, but it is on **less solid legal footing and would face significant impediments to effectiveness and efficiency.**

Ultimately, NAAQS is not necessarily unworkable as applied to GHGs. On the other hand, it is clearly complicated and potentially inefficient. Largely for this reason, NAAQS remains a distinctly second-best option to Title VI for building cap-and-trade.

## **D. NSPS Trading**

EPA’s last best option to build a cap-and-trade program is through new source performance standards under Section 111. That section enables EPA to prescribe “performance standards” for the emissions of any source category that contributes to dangerous pollution. Though principally focused on new and modified sources, EPA would also have to regulate GHGs from existing sources under Section 111(d). EPA has tried to create a cap-and-trade system under that provision before, but the rule was vacated by a court on unrelated grounds.<sup>610</sup>

### **D.1. Legality of Using NSPS**

For EPA to build a cap-and-trade system under Section 111, the program must fit into the definition of “standard of performance” and must not be precluded by a negative inference.

#### **Trading Fits within Definition of “Standard of Performance”**

The standards promulgated under Section 111 must be “standards of performance.”<sup>611</sup> If EPA wants to develop a cap-and-trade program under Section 111, cap-and-trade therefore must qualify as a “standard of performance.”

Section 111(a)(1) defines “standard of performance” as:

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

Complicating the matter, Section 302—which defines terms “[w]hen used in this Act”—gives a potentially conflicting definition:

The term “standard of performance” means a requirement of continuous emission reduction, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction.

Courts would likely consider the Section 111(a)(1) definition to be a clarification of the Section 302 definition; the two definitions must be harmonized and applied together.<sup>612</sup>

Beginning with the more general definition from Section 302, the elements of a “standard of performance” are: (1) it must require an “emission *reduction*”; and (2) it must require a “*continuous* emission reduction.” If “emission reduction” implies that each individual source must reduce its emissions, then cap-and-trade will not qualify (since it would allow some sources to buy enough allowances to maintain or even increase emissions). However, such a strict application of the term “reduction” fits awkwardly at best with Section 111’s focus on new sources. “Reduce” means to bring down from a baseline, in extent, amount, or degree. But new sources do not have a clear baseline level of emissions, making it difficult to design a requirement for new sources to “reduce” their emissions.

In fact, Congress did not think the term “standard of performance” required each individual source to reduce its emissions. When drafting the 1977 Amendments—which also created the Section 302 definition of “standard of performance”—Congress was concerned about the standards of performance for coal power plants. EPA had set a rate-based standard for sulfur oxides (pounds of pollution per energy output). To comply, plants burning high-sulfur coal had to install “scrubbers” to clean their emissions; but plants burning low-sulfur coal already met the standard. The sulfur content of coal deposits varied geographically, creating economic and political implications. To even the playing field between high- and low-sulfur plants, in 1977, Congress added a specific “percent reduction” requirement on top of any “emission limitations” developed as the standards of performance for power plants.<sup>613</sup> In other words, the general definition of “standard of performance” was not enough to mandate an emissions reduction from every individual source.

Originally, the House of Representatives had treated “standard of performance,” “emission standard,” and “emission limitation” as interchangeable terms under Section 302.<sup>614</sup> When the House accepted the Senate’s wording of the definition for “emissions standard,” the terms were broken into separate provisions under Section 302. However, it is not clear that different meanings were intended.<sup>615</sup> Both categories specifically include “*any* requirement relating to the operation or maintenance of a source to assure continuous emission reduction.”<sup>616</sup> If all such requirements belong to both categories, clearly there is considerable overlap in the meaning of the two categories. The only apparent difference is that “emission standards/limitations” include “any design, equipment, work practice, or operational standard,” whereas “standards of performance” do not.

The definition of “emission standard/limitation” therefore informs the interpretation of “standard of performance.” Section 302 defines an “emission standard” or “emission limitation” as “a requirement . . . which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.” “To limit” means to confine within a boundary; therefore, “limit” does not imply that any individual source must reduce emissions. Moreover, a rate- or concentration-based standard does not even guarantee any overall decrease in emissions; for example, a source could comply with an hourly standard by decreasing pollution per hour but increasing total hours of operation, thereby maintaining or increasing total pollution. A cap-and-trade program is consistent with this understanding of a performance standard, since it will restrict emissions to those covered by allowances, and since the total number of available allowances will be limited.

Section 302 also requires the standard of performance to operate “continuous[ly].” A cap-and-trade program will continuously limit emissions since it will apply to all emissions from a source. By the term “continuous,” Congress intended to prevent the use of intermittent controls or dispersion techniques (such as stack height) to comply with standards of performance.<sup>617</sup>

Thus, a cap-and-trade program seems consistent with Section 302’s definition of a performance standard. However, Section 111(a)(1) offers a more specific definition, with additional criteria. Under Section 111, the elements of a standard of performance are: (1) it must be “a standard for



emissions of air pollutants”; (2) it must “reflect[ ] the degree of emission limitation achievable through the application of [a]...system of emission reduction”; (3) the system reflected must be “the best system of emission reduction which (taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements)”; and (4) the system reflected must be “determine[d]” by EPA to be “adequately demonstrated.”

Whether a “standard for emissions” means an “emission standard” (as discussed above) or simply a rule governing emissions, a cap-and-trade program qualifies. The required standard must then be set to “reflect” an emissions level “achievable” by employing a “system of emission reduction.” Note that the standard does not—and in fact must not<sup>618</sup>—specify a particular system of emission reduction; it simply sets a level “reflecting” such a system. Under a cap-and-trade program, the standard would require that a source hold enough allowances to cover 100% of its annual emissions. That degree of emission limitation is “achievable” under any program creating and capping allowances, provided the total cap is set sufficiently high that any restriction on emissions can be met given the state of technology and cost considerations.

That analysis assumes a cap-and-trade program qualifies as a “system of emission reduction.” Some statutory evidence suggests that by “system,” Congress meant processes or equipment that would reduce emissions at individual sources. For example, the term “technological *system of continuous emission reduction*” means:

(A) a technological process for *production or operation by any source* which is inherently low-polluting or nonpolluting, or

(B) a technological system for continuous *reduction of the pollution generated by a source* before such pollution is emitted into the ambient air, including precombustion cleaning or treatment of fuels.<sup>619</sup>

Cap-and-trade cannot guarantee the reduction of pollution generated by each source. However, the definition of “technological system” included pre-combustion fuel treatments. In the Conference Report on the 1977 Amendments, Congress specifically authorized EPA “to give credit for accepted minemouth and other precombustion fuel cleaning processes, *whether they occur at, or are achieved by, the source or by another party.*”<sup>620</sup> In other words, a process whereby third parties were responsible for reducing emissions still counted as a “system of emission reduction.” Cap-and-trade fits perfectly into such a model.

Cap-and-trade can easily qualify as the “best” system “taking into account the cost of achieving such reduction and any nonair quality health and environmental impact and energy requirements.” This language suggests EPA must weigh costs and benefits, and market-based schemes are widely regarded as a highly cost-efficient way to reduce pollution. These cost and energy requirements must also be considered when EPA sets the specific cap, and the particular structure and stringency selected must be “adequately demonstrated.” EPA can cite other successful trading programs (Acid Rain under Title IV of the CAA, the European experience with greenhouse gas trading, the regional cap on power plant emissions in northeastern states). Ultimately, some form of cap-and-trade will fit under the statutory definition of “standard of performance.”

### **Statutory Structure Does Not Preclude Trading**

Two main arguments have been raised against developing cap-and-trade under Section 111.<sup>621</sup> First, in 1977, Congress amended the definition of “standard of performance” under Section 111(a) specifically to require that all new source performance standards reflect the best technological means of emission control. In 1990, Congress removed that technology-specific restriction, but did not explicitly give permission to trading programs. Some legal analysts believe this “silence...is

significant in light of the fact that Congress was at that very time enacting our first trading program [for acid rain], in Title IV of the Act.”<sup>622</sup>

This argument carries some weight, especially with respect to *new source* performance standards. In 1977, Congress mandated that new sources must operate and maintain technological systems to comply with performance standards.<sup>623</sup> When Congress removed the technological requirement in 1990,<sup>624</sup> the Senate specifically noted: “Sources commencing operation after this section takes effect cannot emit more than they would have emitted without this provision.”<sup>625</sup> Since a cap-and-trade program would allow some sources to emit more than they would under a technology-based standard, the legislative history may complicate the application of a cap-and-trade program to new sources.

On the other hand, ever since 1977, Congress made it clear that performance standards adopted for *existing sources* should be “based on the best available means (not necessarily technological)”:

Under the committee bill, the standards in the section 111(d) State plan would be based on the best available means (not necessarily technological) for categories of existing sources to reduce emissions. The Administrator would establish guidelines as to what the best system for each such category of existing sources is. However, the State would be responsible for determining the applicability of such guidelines to any particular source or sources.<sup>626</sup>

Congress knew that it may be difficult for existing sources to retrofit with add-on controls and, therefore, wanted to give EPA more flexibility in setting performance standards. To the extent cap-and-trade was always a permissible option for existing source performance standards, congressional silence on the issue in 1990 has little impact.

The second argument against creating cap-and-trade under Section 111 is that Section 111(h) provides the exclusive alternative option to technology-based standards. Section 111(h) gives EPA authority to prescribe a design, equipment, work practice, or operational standard if a performance standard is “not feasible”:

[T]he phrase “not feasible to prescribe or enforce a standard of performance” means any situation in which the Administrator determines that (A) a pollutant or pollutants cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any Federal, State, or local law, or (B) the application of measurement methodology to a particular class of sources is not practicable due to technological or economic limitations.

From this section, some commentators conclude: “Clearly, Congress thought the most likely scenario under § 111 was for pollutants to be ‘emitted through a conveyance designed and constructed to emit or capture such pollutant[s]’—an assumption at odds with EPA’s assertion of authority to construct a trading program under § 111.”<sup>627</sup> However, Congress expressly did not want to limit performance standards to end-of-pipe control technologies, at least for existing sources. While Section 111(h) clearly limits when design, equipment, work practice, or operational standards can be applied, EPA generally can set any emissions limitation for existing sources that meets the definition of “standard of performance.”

In fact, the legislative history for Section 111(h) reveals the central purpose was to give clear preference for “numerical performance standards.”<sup>628</sup> Cap-and-trade will allow EPA to set a numerical standard: namely, that 100% of emissions must be covered by allowances.

## **D.2. Effectiveness, Efficiency, and Fairness of Using NSPS**

Performance standards apply to particular source categories and are designed to limit overall emissions from such categories. Congress instructed EPA to “establish guidelines as to what the best system *for each such category* of existing sources is.”<sup>629</sup> Nevertheless, EPA may be able to integrate trading among various source categories. So long as every source in a category is subject to a performance standard limiting its emissions to those covered by an allowance, it may not matter if EPA defines a national pool of allowances as opposed to a category-specific budget. Recall that certain permissible structures for a performance standard do not necessarily guarantee any particular emissions reductions from individual sources or even from entire categories (e.g., a rate-based standard if not coupled with a restriction on hours of operation). Indeed, Congress specifically allowed power plants to be credited with the emissions reductions achieved by mining operations—a specific source category. Moreover, EPA is granted considerable discretion to “distinguish among classes, types, and sizes within categories of new sources for the purposes of establishing such standards.”<sup>630</sup> While not a blank check, EPA can define a single category of sources rather broadly.

Additionally, recall that performance standards are not pollutant-specific standards. Therefore, it should be permissible for EPA to apply the same pool of allowances to the emission of all greenhouse gases.

That said, there are some critical limitations on the scope of a cap-and-trade program under Section 111. As mentioned above, applicability of a trading program to new sources is somewhat questionable compared to existing sources. Moreover, it will be difficult for EPA to focus its program on upstream sources. Cap-and-trade programs are often thought to be more efficient if they target upstream rather than downstream sources: for example, the natural gas importer instead of the natural gas consumer. Arguably, the natural gas importer does “contribute significantly to air pollution.”<sup>631</sup> Unfortunately, Section 111 applies to categories of stationary sources, defined as “any building, structure, facility, or installation which *emits or may emit* any air pollutant.”<sup>632</sup> While a natural gas importer could be regulated for its own emissions, it cannot be regulated under Section 111 for the future emissions generated when a different source burns the natural gas it processed or sold.

Given this relatively downstream coverage, it will be challenging for EPA to reach all significant emission sources. Small sources—such as indoor malls, many apartment buildings, large houses of worship, some restaurants, and even bakeries—are responsible for about a third of all greenhouse gas emissions from stationary sources (almost 20% of overall U.S. emissions).<sup>633</sup> Regulating such sources could prove highly inefficient or administratively impossible. Finally, since source categories must be individually regulated, it may take a good deal of time for EPA to assemble anything approximating comprehensive coverage through a piecemeal regulatory process.

EPA will be on its most solid legal footing when applying its cap-and-trade system under Section 111 to existing sources. For the regulation of existing sources, Section 111(d) requires use of state implementation plans similar to those set up by NAAQS; Section 111(c) also permits the use of state implementation plans for new source regulations. Therefore, developing a cap-and-trade system under Section 111 will encounter some of the same problems that confronted EPA in the NAAQS regime: the limitations on requiring states to participate in a national trading program, the potential delays from waiting for individual states to complete their regulatory processes. While state-by-state implementation does have some advantages—particularly with respect to distributional fairness and transparency—ultimately a cap-and-trade system under Section 111 will face impediments to effectiveness and efficiency.

EPA clearly has options to design a cap-and-trade program entirely under existing authority. Neither EPA nor the President will need to wait for Congress to act either domestically or internationally. Unfortunately, even EPA's best options will be partially undermined by other statutory obligations. The next Chapter will look at tactics to minimize that potential for incompatibility.

# Chapter Six

## Best Options for Mandatory Obligations

The statutory obligations outlined in Part One will not suddenly disappear if EPA has determined to use its discretion under a different statutory provision to regulate greenhouse gas emissions by creating a cap-and-trade system. For example, Congress specifically did not want the broad authorities contained in Title VI to allow EPA to “avoid or undercut the more specific requirements that are contained in this Act. This language is intended to supplement the authorities set forth elsewhere in this title, not to supplant them.”<sup>634</sup>

Cap-and-trade is the most efficient and, perhaps, the inevitable regulatory design if either Congress or EPA takes action toward a comprehensive climate change strategy. Unfortunately, not all of EPA’s statutory obligations will necessarily fit into the model of a cap-and-trade program. While Congress could—and should—amend the CAA to alter those obligations if it were to enact climate change legislation, EPA may not be able to avoid creating some command-and-control regulations.

The overall efficiency of any comprehensive cap-and-trade system designed under EPA’s CAA authorities may be limited by the simultaneous application of command-and-control regulations. If a cap-and-trade system is already in place, many command-and-control style regulations will at best have no effect on total greenhouse gas emissions; at worst, command-and-control regulations may inefficiently increase compliance costs, reduce market flexibility, or even increase global emissions due to leakage.

That said, these statutory obligations exist regardless of whether EPA also chooses to exercise its discretionary authority and pursue a regulatory cap-and-trade program. Therefore, the existence of these statutory obligations should not interfere with EPA’s plans to adopt other effective and efficient market-based regulations, as outlined in Chapter Five.

Section A will explain how command-and-control regulations generally will interact with a cap-and-trade program. Section B will then explain EPA’s best options to carry out its mandatory obligations to regulate mobile sources: namely, promulgate existing federal fuel efficiency standards or California GHG emissions standards for motor vehicles, and institute a variety of new emissions standards for aircraft and marine vessels. Section C lists EPA’s best options for its New

Source Review obligations, including tactics for narrowing the scope of applicability and minimizing the compliance costs. Section D explores how to integrate obligations for review of new source performance standards into a cap-and-trade program, and Section E discusses strategies for Title V and NAAQS obligations.

## **A. Command-and-Control Obligations May Undermine Cap-and-Trade**

How potential regulations will interact with a cap-and-trade system depends on the characteristics of that hypothetical program. This analysis will make the following assumptions:

- Economy-wide cap-and-trade is in effect.
- The annual cap set is effective, meaning it places an enforceable constraint on total national emissions of greenhouse gases. In other words, the demand for emissions credits is greater than the supply.
- The annual cap set is optimal, meaning the emissions reductions prescribed for each year are properly calibrated to achieve the environmental goals.
- Emission credits are distributed purely through auction.

There are three principal ways in which command-and-control regulations could interact with this type of cap-and-trade system.

### **Scenario #1: More Stringent Regulation of All Sources**

If command-and-control regulations force all greenhouse gas sources to reduce their emissions more than they would have under the cap-and-trade system, total national emissions will of course go down. But since the hypothetical cap-and-trade system is presumed to be optimal, steeper emissions reductions will be unnecessary to achieve the desired environmental goals, and therefore they will impose regulatory costs greater than benefits.

There is some risk under this scenario that, even though total national emissions may go down, total global emissions may remain the same or even increase.<sup>635</sup> Stringent command-and-control regulations will increase production costs for domestic industry, potentially motivating them to relocate overseas. The resulting emissions leakage could produce a counterproductive outcome, to the extent that the new host countries may impose fewer or no emissions controls on the outsourced industries. Leakage is a danger of any regulatory system, even a pure cap-and-trade system. Yet the risk is much more pronounced under command-and-control regulations, and is perhaps especially strong under a scenario where stringent compliance costs outweigh regulatory benefits.

### **Scenario #2: More Stringent Regulation of Some Sources**

If command-and-control regulations force only certain greenhouse gas sources to reduce their emissions more than they would have under the cap-and-trade system, total national emissions will not change. Since the cap-and-trade system is presumed to be effective, the demand for emissions credits is greater than the supply. When command-and-control regulations force a particular source to make deeper emissions cuts, the result is that source will purchase fewer emissions credits or fewer offset credits. Those extra emissions credits will instead stay in the auction, where another source will purchase them rather than reducing its own emissions or sponsoring offset reductions. In other words, for every additional emissions cut made by a command-and-control regulation, an emissions credit will be transferred to another source that will increase emissions by the same amount. From the perspective of total national emissions, the result is a wash.

Yet the potential impact of selective command-and-control regulation is actually more damaging. As explained above, command-and-control regulation of certain sources will reduce those sources' demand for emissions credits. While total economy-wide demand for credits will still exceed total supply, total demand will drop. When demand drops so will price. The price of emissions credits is what the cap-and-trade system relies on to motivate research into new technologies that will reduce emissions more efficiently. As price drops, the pace of technology research and deployment is likely to slacken as well. Granted, the command-and-control regulations could themselves be technology-forcing and may encourage research and deployment in the regulated sector. Unfortunately, the regulated sector is not necessarily the most efficient sector for technology research and deployment. If the market could have identified more efficient technologies elsewhere, the command-and-control regulations have undermined the structure of the cap-and-trade system.

Put more broadly, command-and-control regulations would interfere with the market flexibility necessary for an effective cap-and-trade system. By constraining the compliance options of certain sources, the cap-and-trade system sacrifices the efficiencies gained by operating on an economy-wide basis, which lets the market identify the most cost-effective means of reducing emissions.

### **Scenario #3: Less Stringent Regulation of All Sources**

Finally, and obviously, if command-and-control regulations do not force any greenhouse gas sources to reduce their emissions more than they would have under the cap-and-trade system, the regulations achieve no regulatory benefits. While such regulations might also impose no new compliance costs, most regulations still carry potentially high administrative costs.

In short, command-and-control regulations have a high potential to be detrimental to a cap-and-trade regime. Ultimately, some of EPA's statutory obligations are going to result in new command-and-control, technology-based regulations that impose additional compliance costs and may interfere with a cap-and-trade system. Luckily, EPA will not be without options when it comes to implementing its statutory obligations, and the agency should identify and exercise its best, most compatible, most efficient options. While this strategy can partially preserve the integrity of the cap-and-trade system created under the CAA, only Congress can truly eliminate these inefficiencies by amending the Clean Air Act with new legislation.

## **B. Mobile Source Obligations**

EPA appears poised to finalize an endangerment finding for GHG emissions from motor vehicles in April 2009, and probably to grant California its waiver by June 2009. It is vital that EPA understand its regulatory options and their consequences because once the endangerment finding is finalized, it will trigger EPA's obligations to regulate motor vehicles as well as some other mobile sources. EPA will be required to issue emissions standards for motor vehicles, aircraft engines, and marine vessels once it finalizes its proposed endangerment finding. Unfortunately, cap-and-trade is probably not available to respond to these obligations. In the case of motor vehicles, to minimize costs and inefficiencies if a cap-and-trade system is in place, EPA should simply adopt standards already enforced by other authorities. Because aircraft and marine vessels pose unique concerns, however, issuing emissions standards would in fact be beneficial to a cap-and-trade system.

### **B.1. Cap-and-Trade Is Unavailable**

Given the statutory language in Title II, imposition of a cap-and-trade system for emissions from specific mobile sources appears difficult at best, and infeasible at worst.

Under Title II, EPA has authority only to craft “emissions standards.” All Title II sections applicable to specific mobile sources (202, 213, and 231) authorize EPA to set “standards applicable to emissions.” This phrase appears to be used interchangeably with the phrase “emissions standards” throughout the CAA,<sup>636</sup> implying that the two most likely refer to the same concept.<sup>637</sup>

The CAA defines an “emission standard” as:

a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this Act.<sup>638</sup>

EPA may use multiple approaches in achieving pollution reductions—for example, through the use of “end-of-pipe” limits, operational or maintenance requirements, and any design, equipment, work practice, or operational standards.<sup>639</sup> And EPA has “significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies.”<sup>640</sup>

But these regulations must actually “*limit* the quantity, rate, or concentration of emissions of air pollutants on a continuous basis.” Thus, a regulation that is merely voluntary or purely informational would be insufficient.

A cap-and-trade system might fit into this definition because it actually “limits” the emissions of air pollutants. However, there are several key hurdles to using Title II in this manner. First, a cap-and-trade system may not fit within the authority granted EPA to regulate emissions from specific vehicles. As explained in Chapter Four, a chief concern when trying to fit a cap-and-trade system within any provision in the CAA is whether that provision requires emissions reductions to be achieved by every individual source. A cap-and-trade program cannot guarantee such a result, since some sources may choose to buy enough emissions credits to continue or even increase their pollution output.

Key sections in Title II, such as Section 202, state that new motor vehicle emissions standards “shall be applicable to such vehicles and engines *for their useful life* . . . whether such vehicles and engines are designed as *complete systems or incorporate devices* to prevent or control such pollution.”<sup>641</sup> This requirement could be read to imply that the pollution from each individual vehicle or engine must be separately controlled, either through a “complete system” or through a “device.”<sup>642</sup>

As another example, section 213, covering new nonroad vehicles and engines, contains the same language pertaining to “useful life” of the applications.<sup>643</sup> While EPA has in the past allowed fleet-wide averaging of mobile source pollution, which also does not guarantee reductions from each individual source, and has gone unchallenged in this practice, a strict interpretation of the plain language may be inconsistent with cap-and-trade.

Second, as explained in Chapter Four, the negative inference against trading is strong for any sections that were part of the original structure of the CAA, which Congress believed did not originally authorize the use of economic incentives. Section 202 is one example of such a section, as its language has remained essentially unchanged since 1970. Thus, a negative inference could prevent EPA from using its authority under section 202 to implement a cap-and-trade system.

Even if EPA could justify its legal authority to create a cap-and-trade system under any of the sections regulating specific mobile sources, there would be a number of disadvantages. Most



importantly, these caps would be extremely downstream, regulating tailpipe emissions. It could also be difficult to integrate caps for the different classes of vehicles—one for motor vehicles, one for nonroad vehicles, and one for aircraft. As explained in Chapter Five, EPA should instead pursue the option of instituting a cap-and-trade system on vehicle fuel, which is more clearly supported by legal authority and more efficient.

## **B.2. Best Options for New Motor Vehicles**

As explained in Chapter Two, once EPA finalizes its proposed endangerment finding for motor vehicles, EPA will be obligated under the CAA to issue regulations for motor vehicles. Because of the language in Section 202, those regulations must be in the form of emissions standards mandating some type of limit on GHGs emissions. These types of command-and-control regulations will be detrimental to a cap-and-trade system, instituted by EPA or Congress, that covers vehicle fuel. Therefore, EPA should choose an option that creates the least inefficiencies in such a system: it should adopt existing standards—either in the form of the California GHG Emissions Standard or the Department of Transportation’s fuel economy standards.<sup>644</sup>

### **Adopt California GHG Emission Standards**

A GHG emissions limitation standard, like all command-and-control regulations interacting with a cap, will create no added GHG reduction benefit.

GHG emissions standards, as well as fuel efficiency standards, increase the efficiency of motor vehicles, which will lower the cost of driving per mile traveled. As driving becomes cheaper, a

If a cap-and-trade system is already in place, many command-and-control style regulations will at best have no effect on total greenhouse gas emissions; **at worst, they may inefficiently increase compliance costs, reduce market flexibility, or even increase global emissions due to leakage.**

“rebound effect” will lead to an increase in vehicle miles traveled.<sup>645</sup> More miles driven equals more GHG emissions. Most policy analysts do not believe that a direct limitation on vehicle miles traveled is practical, since it would require the monitoring and regulation of every individual vehicle. Although the “rebound effect” created by these regulations may be small given that that personal vehicle use is fairly inelastic, and the net gain of imposing such standards would be an overall GHG emissions decrease, these regulations will not reduce GHG emissions as effectively as a cap-and-trade system on vehicle fuel.<sup>646</sup>

A cap on the sale of fuel will increase the price of fuel, as well as the cost per mile of driving, and will therefore incentivize a small decrease in vehicle miles traveled. There will be no added benefit of introducing a GHG emissions standard into this system. Those regulations will not reduce GHG emissions below the economy-wide cap because actors will be incentivized to reach the limits of their permits or sell their permits to others to use. Drivers will still consume the same amount of fuel up to the cap—with or without a GHG emissions regulation. These regulations will create no benefit in GHG reduction or fuel consumption, but will result in an increase in compliance and administrative costs.<sup>647</sup>

However, despite this and other inefficiencies with command-and-control regulations, because of section 202’s mandate to adopt emissions standards, EPA will be required to adopt some type of mandatory control limitation. EPA’s best option may be to adopt standards that are identical to existing GHG emissions standards—namely, that of California. Seventeen states have already

adopted or plan to adopt these standards,<sup>648</sup> and will create a widespread regulatory regime once EPA grants California the waiver as expected in mid-2009. Through this method, EPA could avoid increasing regulatory obligations on or creating regulatory uncertainty for car manufacturers, as manufacturers will already need to comply with these regulations for cars sold in California and the other states.

As explained in Chapter One, California's GHG emissions regulation sets a carbon-equivalent grams per mile limit on GHG emissions, and measures emission from the tailpipe.<sup>649</sup> Manufacturers can meet this standard through alternate methods—including increased fuel efficiency, improvements in design, use of lower carbon content fuel, or the use of hybrids. That approach sets increasingly stringent performance standards that manufacturers are required to meet over time periods using averaging, trading, and banking to increase the economic effectiveness of emissions reductions and provide more compliance options.

The Supreme Court held in *Massachusetts v. EPA* that EPA could issue GHG emissions regulations for motor vehicles despite the existence of the fuel efficiency standard authority granted to the Department of Transportation and its National Highway Traffic and Safety Administration (NHTSA).<sup>650</sup> In reality, however—even though a GHG emissions standard gives car manufacturers some flexibility in terms of how to reach that standard—given current technology, lower GHG gas emissions will be most simply achieved by increasing the fuel economy of vehicles.<sup>651</sup> Because each gallon of gasoline, the primary fuel for motor vehicles, contains approximately the same amount of carbon, and essentially all the carbon in fuel is converted to carbon dioxide, a tailpipe carbon dioxide regulation will be the equivalent of a fuel economy regulation because they both regulate fuel economy.

This problem is not insurmountable. If there is a practical conflict between the standards, automobile manufacturers will simply comply with the more stringent regulations. If EPA's GHG regulations are more stringent, then manufacturers will comply with those. To ensure compatibility, EPA should consult with NHTSA before issuing GHG emissions standards.

### **Adopt Current CAFE Standards**

In the alternative, or in tandem, EPA should consider adopting the NHTSA's fuel efficiency standards for each new model year.

Corporate Average Fuel Efficiency (CAFE) standards had been relatively stagnant until Congress passed the Energy Independence and Security Act (EISA) in December 2007.<sup>652</sup> The EISA modified the structure of CAFE standards by requiring NHTSA to increase the standards with each model year to achieve this target. It set a goal for a national fuel economy standard of 35 miles per gallon (mpg) by model year 2020—a 40% increase in fuel efficiency from the then-current standards. In 2008, the Bush Administration proposed but did not finalize more stringent standards.<sup>653</sup> In March 2009, NHTSA—under President Obama's instruction—issued final regulations increasing CAFE standards for 2011 model cars and light trucks to an industry-wide combined average of 27.3 mpg, an increase of 2.0 mpg over the previous standard.<sup>654</sup>

If EPA were to work with NHTSA to set more stringent fuel efficiency standards, those standards would decrease the efficiency of a cap-and-trade system in the same ways as would a GHG emissions standard. With a cap on fuel in place, more stringent fuel efficiency standards will not decrease the amount of GHG emitted. They will also force manufacturers to make decisions that may not be the most cost-effective. Manufacturers already will be incentivized to increase fuel efficiency for consumers, as consumers will seek to purchase models that use the least amount of fuel. However, a manufacturer may find that another method—for example reducing GHG by switching part of its fleet to a low carbon fuel—may be more cost-effective than meeting fuel

efficiency standards. In this way, more stringent fuel efficiency standards will result in no additional GHG reduction, but will result in an increase in compliance and administrative costs.

Instead, EPA should simply adopt NHTSA's recommended CAFE standards for each model year. As required by Section 202, these standards will "limit[] the quantity, rate, or concentration of emissions of [GHGs] on a continuous basis," as there is a mathematical correlation between decreasing carbon dioxide emissions from the tailpipe of a motor vehicle and increasing its fuel economy. These standards will also avoid creating additional inefficiencies in a vehicle fuel trading program.

### **B.3. Best Options for Aircraft Engines**

As discussed in Chapter Two, EPA must respond to petitions to regulate aircraft emissions with a positive endangerment finding, which will trigger a mandatory duty to issue emissions standards.

Global transportation vehicles such as airplanes create an added layer of complexity because those vehicles travel outside of the U.S. and are free to purchase fuel while at airports outside the U.S. Because a cap-and-trade system for fuel would not capture all aircraft polluters, there is room for regulation in the area of aircraft emissions. Furthermore, as described in Chapter Four, an EPA-created cap-and-trade system under Section 211 would not automatically apply to aircraft fuel.

To be fully effective, EPA must regulate both U.S.- and foreign-flagged aircraft flying into the United States,<sup>655</sup> and EPA probably has this authority. First, Section 231 of the CAA does not differentiate between U.S.- or foreign-flagged vessels, and EPA regulations define "aircraft" as "any airplane for which a U.S. standard airworthiness certificate or equivalent foreign airworthiness certificate is issued."<sup>656</sup> Moreover, the FAA, which is responsible under the CAA for prescribing regulations to implement emission standards for aircraft established by EPA, has authority to and does in fact already impose regulations on foreign aircraft in U.S. airports.<sup>657</sup>

International law is also not a bar to EPA action, and actually supports it. For example, the Convention on International Civil Aviation provides that any member can apply non-discriminatory rules to the aircraft of other states operating within its airspace. Under this non-discrimination clause, it could be argued that a country *must* include all airlines operating within it regardless of their country of origin. Additionally, international law requires nations to ensure that activities within their territory do not cause transboundary environmental harm.<sup>658</sup> Allowing aircraft flying within U.S. airspace, whether U.S. or foreign, and continue to emit significant and increasing levels of greenhouse gases that contribute to global climate change contravenes this principle.<sup>659</sup>

The European Union has already attempted to exercise such authority as it relates to GHG emissions. In 2008, the European Parliament voted to impose the EU's Emissions Trading Scheme, a cap-and-trade system for carbon-dioxide emissions, on aircraft carriers—including both EU and non-EU aircraft flying into and out of the EU's airports.<sup>660</sup> The U.S. would be well within its authority to do the same.

EPA can satisfy its statutory obligations with respect to aircraft by adopting any or a combination of the regulations discussed below, and applying them to all aircraft flying into U.S. airports.

#### **Improved Aviation Operations and Procedures**

The California and Earthjustice petitions suggest EPA mandate the use of the following aviation operational and procedures at U.S. airports to reduce greenhouse gas emissions from aircraft engines, including:

- Using continuous rather than stepped descents to reduce fuel burn and emissions;

- Minimizing engine idling time on runways, and employing single engine taxiing;
- Reducing engine thrust and reverse during high-intensity periods such as take-off and landing;
- Reducing auxiliary power unit usage (through plugging into ground-side power supplied by the airport);
- Coordinating between air traffic control centers to optimize timetables, route networks, and flight frequencies to reduce stopovers, especially for short- and medium-haul flights, and to select more fuel-efficient routes;
- Increasing the number of landing operations per hour during weather with low clouds, thereby decreasing the need for aircraft to circle while waiting for landing clearance); and
- Reducing levels of excess fuel carried, and instituting more regular maintenance and cleaning of engines and airframes.<sup>661</sup>

All of these aviation procedures would supplement a cap-and-trade system. Even with a cap-and-trade system in place, airline companies could never arrive at such a result. The major benefit to a cap-and-trade system is that the market will be able to find solutions and make technology improvements when they are cheaper than purchasing permits. Command-and-control regulations are disfavored when they force market actors to make technology improvements that may not be the most efficient solutions. But in the case of airport procedures, FAA and airports would be responsible for implementing these procedures. Whenever the actors who pay the fuel prices are not those must obey a command-and-control regulation, mandatory regulations could compliment a cap-and-trade system.

Second, because these improved procedures are all technologically feasible now, FAA and EPA could implement them swiftly for new and in-use aircraft—before Congress acts on a cap-and-trade system. Improved aircraft operational practices could reduce greenhouse gas emissions by 6-12%.<sup>662</sup> Therefore, these procedures would reduce emissions in the near-term, and could therefore get us to a lower emissions cap, once eventually set. Additionally, because these operational procedures will be fairly inexpensive to implement, the benefits will outweigh the costs.

### **More Efficient Aircraft Design Standards**

Earthjustice's petition notes that the airline industry could reduce greenhouse gas emissions by adopting more efficient aircraft designs and technologies, including:

- Reducing weight (by using lighter composite materials for airframes, or removing weight from the nacelle of the aircraft);
- Making small changes to the bodies of aircraft (such as using: winglets on the tips of aircraft wings to improve aerodynamics, electric fuel and air pumps inside planes, disk and airfoil blade materials that can withstand higher operating pressures and temperatures, and unducted-fan engines);
- Designing aircraft to operate at lower altitudes and reduced speeds (to reduce contrail and cirrus cloud formation); and
- Using new, more efficient airplane designs such as “blended wing” or “silent” aircraft.<sup>663</sup>

Because aircraft travel internationally and have the ability to refuel in countries that do not have a cap on vehicle fuel, aircraft have the ability to fall outside a national cap-and-trade system. Regulations improving aircraft efficiency to decrease GHG emissions would therefore be a valuable

supplement to a cap-and-trade system. EPA could apply some of these standards to existing aircraft.

### **Fuel Efficiency Standards/GHG Emissions Limitations**

No petition specifically requests EPA to set fuel efficiency standards or carbon emissions standards for aircraft engine emissions. As noted in Chapter 5, FAA has authority to regulate aviation fuels once EPA makes an endangerment finding for them.<sup>664</sup> Because aircraft travel internationally, there is room for fuel efficiency and fuel content standards when dealing with aircraft emission and EPA should work with FAA to set such standards.

## **B.4. Best Options for New Marine Vessels**

As explained in Chapter Two, EPA must respond to pending petitions to regulate marine vessels with a positive endangerment finding, after which EPA will need to issue rules to regulate those emissions unless it can articulate a forceful reason not to.

EPA will not be able to put forth a satisfactory reason, particularly considering the emissions from marine vessels may not be fully captured under a vehicle fuel cap and trade program. Due to the capacity of marine vessels to travel internationally, they pose the same complications as aircraft and would benefit from command-and-control regulations. Marine vessels—both US-flagged and foreign-flagged—could refuel at ports in countries that do not have caps on vehicle fuels, and emissions from these vessels would therefore be unregulated. Thus, EPA probably has no reasonable justification for refraining from issuing emissions standards for marine vessels despite the discretionary language in Section 213.<sup>665</sup>

Almost 90% of ships entering U.S. ports are foreign-flagged.<sup>666</sup> If EPA were to regulate only U.S.-flagged ships, it would not capture the vast majority of GHGs emitted from marine vessels in U.S. waters. Foreign ships definitely have capacity to purchase their fuel outside the U.S.—and therefore outside the purview of a United States domestic fuel cap. Failure to apply regulations to foreign vessels will dramatically limit the effectiveness of both a fuel cap.

EPA has explicitly declined to decide, or give any opinion, as to whether the CAA gives it the authority to impose emissions standards on foreign-flagged vessels.<sup>667</sup> However, the CAA and international law probably do grant EPA such authority. First, the plain text of the CAA does not distinguish between US- and foreign-nonroad vehicles and engines,<sup>668</sup> and U.S. courts have upheld applications of similar broad federal regulations and laws to foreign-flagged marine vessels.<sup>669</sup>

The Supreme Court has recognized that marine vessels voluntarily entering the territorial waters of another country subject themselves to the laws and jurisdiction of that country.<sup>670</sup> And, under international law, the U.S. has complete authority to regulate foreign vessels in its ports, internal waters, and territorial seas (typically 12 miles from shore).<sup>671</sup> The U.S. and other countries have repeatedly exercised this authority.<sup>672</sup> The U.S. also could exercise authority under international law to regulate all vessels in its “Exclusive Economic Zone” (usually 200 miles from shore),<sup>673</sup> and the U.S. has exercised this authority in the past.<sup>674</sup>

At the very least, EPA can impose regulations on marine vessels in

When regulating motor vehicles, EPA should choose an option that creates the least inefficiencies in a cap-and-trade system. **It should adopt existing standards—either in the form of the California GHG Emissions Standard or the Department of Transportation’s fuel economy standards.**

its docks and territorial waters, and it should do so in order to effectively control GHG emissions from vessels in U.S. waters. EPA's options to regulate marine vessels as supplements to a cap-and-trade program are discussed below. It could choose one or a combination of the following options.

### **Improved Marine Operational Controls**

The California and Earthjustice petitions suggest EPA mandate the use of the following aviation operational and procedures to reduce greenhouse gas emissions from marine vessels, including:

- Improving routing, planning, and coordination between ports;
- Working with the U.S. Coast Guard to set lower speed limits;<sup>675</sup>
- Optimizing use of auxiliary power, including shore-side powering at ports.<sup>676</sup>

EPA should implement such regulations. As explained above in the context of aircraft, because taking these actions may not be in control of marine vessel owners, owners would never be able to achieve these reductions even under a cap-and-trade system.

### **Vessel Design Standards**

Earthjustice's petition notes that the shipping industry could reduce greenhouse gas emissions by adopting more efficient marine vessel designs and technologies, including:

- Improving hull design to reduce fuel consumption;
- Reducing wavemaking resistance (by installing a bulbous bow or a stern flap (a small plate that extends behind a ship's transom);
- Applying special coatings to ship propellers to reduce ship fuel use;
- Employing sail or kite-assisted propulsion to provide zero-emissions wind power;
- Reducing ship weight through other improvements.<sup>677</sup>

Because marine vessels have capacity to fall outside a national cap-and-trade system by refueling at ports in countries that do not have caps on vehicle fuels, EPA should issue such standards,

Additionally, EPA and U.S. Coast Guard should reevaluate any safety regulations that may call for certain size or weight specifications in ship design that may now be outdated given these advances in technology and that may actually prevent induction of these new designs into marine fleets.

### **Fuel Efficiency Standards/ GHG Emissions Limits**

EPA should issue fuel efficiency standards or GHG emissions limitations for marine vessels because the vast majority of GHG emissions from marine vessels in U.S. ports and waters will be able to refuel outside the limits of the cap system. EPA's new monitoring rule is an excellent first step to setting emissions standards for marine vessels and engines.<sup>678</sup>

## **C. New Source Review Obligations**

As discussed in Part One, EPA is already required to begin issuing "Prevention of Significant Deterioration" (PSD) permits for new and modified major sources of greenhouse gases. Once EPA constructs a general cap-and-trade system for greenhouse gas emissions or otherwise begins to regulate them as required by Title II, EPA must prescribe the installation of "best available control technology" (BACT) for greenhouse gas emissions before granting PSD permits. EPA also must give appropriate weight to the costs of climate change when issuing either any New Source Review permit.

To the extent any of these required actions will mandate specific emissions controls, they will decrease the effectiveness of any functioning cap-and-trade system. As EPA has explained, “Although PSD would neither reduce nor increase the overall emission reductions achieved under the cap, it would force different choices about the stringency and location of controls than if control choices were based solely on market factors. Under this scenario, the result would be to increase costs without achieving additional GHG emissions reductions.”<sup>679</sup>

### **C.1. Little Potential to Integrate into Cap-and-Trade**

Any requirement to install BACT cannot be satisfied by participation in a cap-and-trade program. Defining “control technology” to include cap-and-trade is an unreasonable stretch of plain statutory language. In particular, BACT requires “application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant.”<sup>680</sup> Moreover, BACT requires the prescription of an emissions limitation to each individual source, based on the “maximum degree of reduction” that is “achievable for such facility” as determined “on a case-by-case basis.”<sup>681</sup> Since cap-and-trade cannot guarantee a precise emissions reduction from each regulated source, cap-and-trade does not fit into the statutory requirements for BACT.

The general statutory obligation to issue New Source Review permits only after consideration of the environmental costs could be integrated into a broader cap-and-trade system. For example, a permit might only be granted if a source purchased enough emissions allowances to cover its greenhouse gas emissions. Indeed, such a system has been proposed by noted legal analysts like Gregory Foote.<sup>682</sup> But this approach will offer no additional environmental benefits if a broader cap-and-trade scheme is already in place; if a cap-and-trade scheme is not yet operational, the value of this approach will still be extremely limited, since it will only cover new and modified major stationary sources.

If greenhouse gases have been listed as criteria pollutants (for example, if EPA uses the NAAQS regime to develop a cap-and-trade system), various regions of the country will fall into “non-attainment” status, depending on where the national ambient air quality standards were set. New and modified sources in nonattainment areas must achieve certain levels of emissions offsets under “non-attainment new source review” (NNSR). NNSR state implementation plans can utilize marketable permits and auctions,<sup>683</sup> and NNSR permit applicants can satisfy their offset credit requirements by obtaining emission reductions in other nonattainment areas.<sup>684</sup> Thus, a trading program could be established for these offset credits. Unfortunately, it would be difficult to integrate this trading program with any broader national cap-and-trade system developed under NAAQS. Section 173 limits which emissions reductions are eligible to count as NNSR offset credits:

Emission reductions otherwise required by this Act shall not be creditable as emissions reductions for purposes of any such offset requirement. Incidental emission reductions which are not otherwise required by this Act shall be creditable as emission reductions for such purposes if such emission reductions meet the requirements [of Section 173].

Even if reductions achieved through the broad, national cap-and-trade program under NAAQS could be classified as “incidental reductions,” NNSR offset credits can only be obtained from other nonattainment areas. Unless the entire country is in nonattainment, such a restriction will interfere with the efficiency of a nationwide market system.

In any event, layering one cap-and-trade system on top of another would create redundant administrative burdens, practical complications, and potential legal conflicts. If a source is regulated under two overlapping cap-and-trade system, emitters will quickly become confused as

to how to monitor the number of credits needed, which sources they can trade with, what offset opportunities they may use, how many credits they have banked for future use, and so forth. EPA will be forced to administer overlapping, duplicative, and potentially conflicting programs, creating further confusion and wasting valuable agency resources.

## **C.2. Best Options for Regulating Small Sources**

All new or modified major stationary sources require a PSD permit. Section 169(1) defines a “major emitting facility” for purposes of PSD permitting to include “any other source with the potential to emit *two hundred and fifty tons per year or more of any air pollutant*.”<sup>685</sup> Similarly, “modification” is defined as “any physical change in, or change in the method of operation of, a stationary source which *increases the amount of any air pollutant* emitted by such source or which results in the emission of any air pollutant not previously emitted.”<sup>686</sup>

A literal interpretation of statutory language would require NSR permits from any new stationary source with the potential to emit more than 250 tons of greenhouse gases, and for any stationary source modification resulting in any increase in GHG emissions. Such a strict application would place under regulation sources normally considered too small and modifications historically treated as *de minimis*, greatly expanding the compliance costs and administrative burdens of the PSD program.

Neither the absurd results canon nor the doctrine of administrative necessity will allow EPA to create exemptions to those requirements. Those principles of statutory interpretation only permit the narrowest deviation from the text necessary to implement congressional intent. In the case of the PSD provisions, Congress intended to give regulators flexibility in dealing with small sources, particularly in order to minimize administrative burdens. Thus, while EPA cannot create outright exemptions, the agency will have some flexibility in how it implements these requirements.

### **EPA Can Set Significance Levels, but Not Higher Thresholds**

EPA has suggested the possibility of altering the 250 ton threshold for major emitting facilities for greenhouse gas sources.<sup>687</sup> Unfortunately, neither the canons of absurd results nor administrative necessity will likely support such a reinterpretation. Directly replacing the 250 ton threshold with some other number is not the narrowest deviation possible to avoid absurd results and respond to administrative necessity: courts do not favor such outright exemptions when other methods, like general permitting, are available.<sup>688</sup> Similarly, EPA’s idea to measure tonnage in a carbon equivalent metric (i.e., because it takes 917 tons of carbon dioxide to reach 250 tons of carbon equivalents) is inconsistent with the statute. Essentially, that approach would read the phrase “any air pollutant” out of the text.<sup>689</sup>

However, EPA should be able to set a relatively high (though still reasonable) significance level for the increase in greenhouse gas pollution necessary to qualify a modification as a “major modification.” EPA routinely sets such significance levels for other pollutants, and the agency has such authority to create rationally designed *de minimis* exemptions to alleviate severe administrative burdens.<sup>690</sup> This is a reasonable and permissible interpretation of the phrase “increase[ ] the amount” in the definition of “modification.”

### **EPA Can Shift Closer to an “Actual Emissions” Model**

EPA should be able to shift from a “potential to emit” to an “actual emissions” model for identifying major emitting facilities of greenhouse gases. By adopting legally and practically enforceable limits on emissions from certain source categories, sources can reduce their potential emissions below the threshold for major emitting facilities. For example, a small chain restaurant might have the potential to emit over 250 tons of carbon dioxide per year if it were to run all of its natural gas



appliances constantly. Though that represents the maximum capacity of the restaurant under its physical and operational design, by agreeing to operate only so many hours per day or by employing control devices, the restaurant could demonstrate that its realistically potential emissions are far below the 250 ton threshold.

Such a definition of “major emitting facilities” should be consistent with the statutory text, as a reasonable interpretation of the term “potential.” To the extent it is not, small deviations will be permissible under the absurd results and administrative necessity canons. Given EPA’s limited time and resources, narrowing the universe of major sources is an administrative necessity.

### **EPA Can Adopt a General Permit Scheme**

The above strategy for narrowing the scope of applicability can be combined with a general permitting scheme. Courts have in the past pointed to such an approach as an acceptably narrow deviation from statutory requirements in order to avoid absurd results or respond to administrative necessity.<sup>691</sup> For example, while the Clean Water Act provides no express authorization for the issuance of general permits under the National Pollution Discharge Elimination System,<sup>692</sup> the legality of using general permits has never been seriously questioned. As early as 1977, the D.C. Circuit stated that the Clean Water Act “allows” the use of general permits.<sup>693</sup> The limited case law involving challenges to elements of an EPA-issued general permit has not involved disputes as to their legitimacy. In *Environmental Defense Center v. EPA*, a panel of the Ninth Circuit invalidated significant elements of an EPA general permit for storm water discharges from small municipal storm sewers, but did not question EPA’s authority to issue general permits. The court noted that “[g]eneral permitting has long been recognized as a lawful means of authorizing discharges.”<sup>694</sup>

Typically general permits are issued on a regional or national basis for certain source categories that are likely to have only minimal cumulative effects on the environment. By standardizing, simplifying, and pre-approving the substantive and procedural conditions for general permits, application of a permit system to small sources becomes considerably less burdensome.

### **EPA Can Phase-In Applicability to Greenhouse Gas Sources**

Courts grant agencies much more leeway in deferring full implementation of a statute than in creating permanent exemptions.<sup>695</sup> Invoking the doctrine of administrative necessity, EPA should be able to justify expanding NSR permit applicability to the largest sources first, and then gradually including smaller sources. The timeline set for phasing in smaller sources could not take longer than reasonably necessary given EPA’s administrative burdens, but EPA will have a good deal of discretion to determine its own resources and capabilities.

### **Making the PSD Program Workable for Small Sources**

Once EPA has set appropriate significance levels to define which modifications are “major,” the only relatively small sources that will still count as “major emitting facilities” for purposes of PSD permits should be newly constructed sources. Even that potentially broad scope of coverage can be further narrowed once EPA moves closer to an actual emissions model. For the remaining sources still covered, phasing in the application of a general permit scheme will substantially minimize the compliance costs.

## **C.3. Best Options for BACT Determinations**

In order to obtain PSD permits, covered sources must install the best available control technology (BACT) for all “regulated pollutants.” Eventually, if not already, GHGs will count as “regulated pollutants.” Typically, BACT determinations are made on a case-by-case basis, in consideration of

potential costs, regional needs, source type, and other context-specific factors. Since including GHGs in the PSD program may greatly expand the number of permits issued, making case-by-case determinations for each individual source may stretch the resources of EPA and state permitting authorities. Moreover, traditional technological controls may not exist for every GHG emitted by every regulated facility. However, there is flexibility in the statute to resolve these problems.

Though BACT determinations are generally to be made on a case-by-case basis, the D.C. Circuit recognized in *Alabama Power* that exceptions can be made if “case-by-case determinations would, as a practical matter, prevent the agency from carrying out the mission assigned to it by Congress.”<sup>696</sup> The development of “presumptive BACT” determinations should be permissible and may help streamline the permitting process.

Efficiency targets may be the most appropriate BACT for such sources, especially given the consideration of costs as part of BACT determinations. Building codes and energy efficiency standards may be especially useful in combination with presumptive BACT and general permits for small sources.

## D. New Source Performance Standards Obligations

As discussed in Part One, EPA is required to respond to pending petitions and make reasonable progress on its backlogged reviews of existing performance standards. During such reviews, adding performance standards for greenhouse gases will likely become mandatory. These performance standards will have to apply to both new and existing sources.

EPA should focus on source categories unlikely to be covered under a cap-and-trade system. To the extent possible, EPA should integrate new source performance standards into the broader cap-and-trade program.

EPA may be able to integrate these performance standards into any broader cap-and-trade system already in place. As discussed in Chapter Five, EPA may be able to interpret the term “performance standard” under Section 111 to include a requirement for regulated sources to hold enough tradable emissions permits to cover their greenhouse gas pollution.

If EPA cannot utilize a cap-and-trade program as performance standards, the agency will instead have to promulgate command-and-control standards, many of which would be incompatible with a broader cap-and-trade system. In particular, performance standards for power plants—a regulatory option advocated by many environmental groups as a good first step to take before climate change legislation<sup>697</sup>—would most likely be incompatible with cap-and-trade. Under any likely version of climate change legislation, power plant emissions will be covered, either directly or by regulating their fuel sources. Because of the general principles described earlier, layering command-and-control regulations on top of a market system is inefficient at best, and possibly detrimental. Even if such performance standards took the form of efficiency requirements, as applied to power plants, these regulations would restrict the market’s choices about what reductions to make.

Fortunately, EPA will have considerable discretion to prioritize its regulatory docket for promulgating new source performance standards. Since EPA recently finalized new rules for steam generating units, the agency need not revisit performance standards for this category for another

eight years (though there are pending petitions for reconsideration of these rules). Meanwhile, it can prioritize review of more compatible options. In particular, EPA can focus on industrial processes not likely to be covered by a broader cap-and-trade system.

Many industrial processes release greenhouse gases as a byproduct of physical or chemical reactions, rather than through combustion of fossil fuels for energy production. For example, to produce cement, raw materials like calcium carbonate are chemically transformed by heat, releasing carbon dioxide in the process.<sup>698</sup> Iron and steel production, lime production, nitric acid production, and many other industrial processes collectively generate around 4.5% of national gross greenhouse gas emissions.<sup>699</sup> Such sources will likely not be covered by cap-and-trade that focuses mostly on fossil fuel used for energy production.

EPA has been petitioned in the past to apply greenhouse gas standards to such sources under Section 111. Cement manufacturing in particular has been targeted.<sup>700</sup> To the extent EPA must use Section 111 to control greenhouse gas emissions using command-and-control regulations, focusing on industrial processes like cement manufacturing might be an ideal starting point. The compatibility of such regulations of a cap-and-trade system will improve if EPA focuses on promulgating efficiency standards or other operational controls. For many greenhouse gas sources, no “adequately demonstrated” add-on control technology will exist. Where prescription of a technology-based performance standard is not “feasible,” Section 111(h) permits EPA to instead apply such design, equipment, or operational standards.

Finally, if EPA does develop new source performance standards for a certain category of sources, existing sources will become subject to the standards when they make modifications that increase their emissions of any pollutant. Until EPA sets a significance level for greenhouse gas emissions increases, any physical or operational change that increases a source’s emissions of greenhouse gases will count as a major modification, subjecting the source to the performance standards. To the extent EPA is using Section 111(d) to regulate existing sources, these *de minimis* modifications will not be a problem, since the source will already be subject to the performance standards. However, EPA can and should define a significance level for greenhouse gas emissions, as explored above in the context of NSR permitting.

## **E. Other Stationary Source Obligations**

### **E.1. Best Options for Title V**

Generally, EPA can utilize many of the same strategies discussed above for NSR permits to make the Title V permit program more workable as applied to greenhouse gas emissions. Moving toward an actual emissions model and adopting a general permit scheme will substantially reduce administrative burdens and compliance costs for relatively small sources. Title V even explicitly authorizes the use of general permits.<sup>701</sup>

## **E.2. Best Options for Existing Criteria Pollutants**

As explained in Part One, even though EPA may be able to exercise its discretion and not list the major GHGs as criteria pollutants, two criteria pollutants already regulated by the NAAQS program—particulate matter (black carbon) and tropospheric ozone—also have global warming effects. Moreover, EPA will be required to take these effects into account when it revises the ambient air quality standards set for particulate matter and ozone.

Regulation of black carbon and ozone will not be incompatible with a broader cap-and-trade system, since such a program will not likely cover those pollutants. Additionally, since black carbon and ozone are more localized in their concentrations and effects than typical greenhouse gases, applying NAAQS to these pollutants will not raise the same workability problems that plague application of NAAQS to most GHGs.

That said, command-and-control regulation of these pollutants may still not be the most efficient approach. As discussed in Chapter Five, EPA may be able to use the international effects of global warming to prescribe state-by-state emissions budgets for pollutants that contribute to climate change. Therefore, EPA may be able to encourage states to integrate their control of black carbon and ozone into a broader cap-and-trade program.

EPA has a range of viable options it can utilize to minimize the potential inefficiencies of its mandatory obligations under the Clean Air Act. Unfortunately, EPA cannot altogether avoid the use of command-and-control regulations that might interfere with any broader cap-and-trade system in place. Ultimately, only Congress can exempt greenhouse gases from these mandatory obligations.

# Chapter Seven

## Supplemental Discretionary Options

As EPA begins complying with mandatory provisions of the Clean Air Act and making policy determinations to implement other regulations, Congress is simultaneously working on comprehensive climate change legislation to address greenhouse gas emissions through a cap-and-trade system. If Congress passes any new legislation specifically on climate change, it may choose to explicitly preclude EPA from addressing greenhouse gas emissions under any other statute. In such an event, EPA would not be able to promulgate any additional greenhouse gas regulations under the Clean Air Act, and it is unlikely that any existing regulations would be grandfathered in to the new system. Indeed, if Congress establishes a legislative cap-and-trade system, it should amend the Clean Air Act at least to exempt greenhouse gas emissions from mandatory control under any incompatible or inefficient requirement.

Yet even if new cap-and-trade legislation does preempt some of EPA's work up until that point, EPA's efforts will not have been a futile use of time and resources. Far from it: since EPA will most likely be responsible for designing the bulk of regulation under new climate legislation, any initial steps EPA takes now under its independent Clean Air Act authorities will lay the groundwork for future regulation. In fact, once specific legislation appears on the horizon, EPA can use its authorities to design precursors or bridges that will smooth transition into the forthcoming legislative cap-and-trade system.

Moreover, Congress may choose not to explicitly preclude EPA from using any authority under the CAA that may be compatible with the new legislation. In such a case, EPA should be able to continue to design regulations that would supplement a cap-and-trade system.<sup>702</sup> Such regulations should also be pursued as supplements to EPA's independent cap-and-trade efforts.

Section A of this Chapter explains EPA's best options for designing precursors and bridges to a cap-and-trade: a vehicle fuel cap, a trading for coal power plants, and PSD permitting or performance standards. Section B explains EPA's best options for supplements to cap-and-trade. These include: information standards and certain technology grants for mobile sources; regulation to capture sources or pollutants outside the scope of the cap; and correcting market imperfections.

## **A. Best Options for Precursors and Bridges**

Congress may still be several years away from successfully passing climate change legislation, and compliance with such a system would probably be delayed by a few years after enacted as well, to give industry time to adjust. Until then, there may be a role for Clean Air Act regulations to act as a precursor to an eventual legislative cap-and-trade system, or as a bridge filling the gaps until such a system comes online. Precursor and bridging regulations could also fill the gap until EPA created its own full cap-and-trade using other CAA authorities, as discussed above.

A precursor regulation would develop a small-scale cap-and-trade program that could merge seamlessly into a subsequent, more comprehensive trading system. For example, EPA may be able to enact a trading program for mobile source fuels relatively quickly. Though a precursor regulation will be wholly redundant once full cap-and-trade comes online, if EPA could use the Clean Air Act to get a temporary cap-and-trade system up and running quickly, even a partial system could have some benefits. Moreover, by forcing certain key industry sectors to start adjusting their behavior sooner rather than later, such a system could create a platform for future action to build on and could allow for a shorter pre-compliance period.

On the other hand, it may be difficult for EPA to get most of its potential cap-and-trade programs up and running very far in advance of any potential legislation or quicker than EPA could design full cap-and-trade under a broad authority like Title VI. Moreover, such regulations could decrease the motivation of either Congress or EPA to move toward the fuller cap-and-trade system, a particularly bad result if EPA's temporary program only has partial coverage. Finally, many Clean Air Act-based cap-and-trade programs would have an inherently downstream focus. Switching from a partial downstream system to an economy-wide upstream model a few years later could create unnecessary transition costs. In particular, uncertainty about future coverage could interfere with market signals and could complicate business planning.

A bridging regulation would deliver short-term benefits and speed the deployment of technology in advance of a future cap-and-trade system. EPA may be able to use certain CAA provisions to act quickly with respect to some significant sources of greenhouse gases. For example, EPA could use the PSD permitting program to require power plants to install the best available control technology for carbon dioxide. If EPA is able to enact such bridging regulations and achieve actual emissions reductions, those reductions must then be reflected in the cap set by any future market system. Cap-and-trade systems usually base the initial allocation of allowances on a historical benchmark, such as national emissions in the year 2000. If that initial benchmark is not adjusted to account for recent emissions reductions, then any environmental gains of the bridge will be short-lived, since the supply of credits will not have changed even as total demand dropped. In other words, once the cap-and-trade system went into effect, any emissions reductions achieved by the bridge would be erased.

When considering the timing of either precursor or bridge actions, EPA should factor in the potential for litigation and whether that could be resolved before fuller cap-and-trade could take effect.

### **A.1. Vehicle Fuel Cap-and-Trade as a Precursor**

As discussed in Chapter Five, EPA has broad authority to promulgate regulations to control and prohibit the sale of vehicle fuel—this authority extends beyond the authority to set emissions standards. The best option for EPA under Section 211 is to implement a cap-and-trade system for fuels to cover all transportation fuels, which fits well within EPA and FAA authority. Such a program would be an effective precursor and bridge to a legislative cap-and-trade system, which

would most likely place an emissions cap-and-trade system on vehicle fuel very similar to that EPA could implement under Section 211. A statutory system could then be easily integrated into an existing EPA cap-and-trade system for fuel.

## **A.2. Trading for Coal Power Plants as a Precursor**

If EPA could develop a cap-and-trade system for a category of upstream sources before Congress could enact climate change legislation or EPA could exercise its broader authorities, such a program could serve as a precursor. The best candidate for such an effort is coal power plants. EPA will have authority to develop a trading program for such sources under Section 111. Importantly, standards of performance “become effective upon promulgation,” and besides affording an opportunity for public comment, there are no statutory time restrictions on the promulgation of such standards.<sup>703</sup> The quicker EPA can develop a program under Section 111, the better it will serve as a precursor.

Coal power plants will probably be the most upstream coal-based source regulated under potential legislation, and EPA may similarly prefer to target coal plants rather than coal mines in any broad cap-and-trade that the agency designs. By contrast, the upstream natural gas producers and importers are more likely to be subject to a cap than the more downstream natural gas power plants. While EPA may have the authority to define all electricity-generating combustion sources as a single category for purposes of trading, applying such trading regulations to downstream sources will not merge seamlessly into a future upstream-oriented nationwide cap-and-trade system. Focusing only on coal will anticipate that upstream-orientation and will keep the program smaller and more manageable. A smaller program could be implemented more quickly, making it a better precursor.

Congress may still be several years away from successfully passing climate change legislation. Until then, there may be a role for EPA to issue regulations to serve as **precursors to an eventual legislative cap-and-trade system, or as bridges filling the gaps until such a system comes online.**

New coal power plants in particular might be a good target. Some legislative proposals plan to

give new power plants considerable free allocations of emissions allowances, reducing their incentive to achieve even cost-efficient emissions reductions.<sup>704</sup> For example, the Lieberman-Warner legislation discussed by the Senate in 2007-08 gave free allocations to new power plants, apportioned on the basis of future electricity generation.<sup>705</sup> The existence of these new entrant allocations should not change total emissions reductions, nor would imposing command-and-control regulations on these new entrants change total emission reductions.<sup>706</sup> But these allocations will cover most of the allowance requirements for some types of new fossil-fuel-fired plants, and will even give other fossil-fuel-fired plants a surplus of credits.<sup>707</sup> Because allowances are worth money, “whereas a cap-and-trade program should increase the cost of [fossil-fuel-based] generation relative to the cost of generation from renewable and nuclear plants, because of [such new entrant provision, the] cap-and-trade program would do precisely the opposite for at least a decade.”<sup>708</sup>

In other words, investments in new plants will shift away from renewable technology back toward traditional technology.<sup>709</sup> Again, this will not result in an actual emissions increase if the original cap is effective. But free allowance allocations interfere with the market by subsidizing older technologies that do not represent the most cost-effective way to reduce emissions. If such

allowances become part of the broader cap-and-trade package, there could be a technology-forcing role for temporary EPA regulations to play.

In particular, by applying a temporary cap-and-trade program to new power plants now, EPA could speed up the deployment of cheap technology to new plants. This regulatory option could have the significant advantage of steering Congress away from giving excessive free allowances to new power plants. If new coal plants are already participating in a cap-and-trade program and are already installing control technologies, some of the justification for new entrant allowances disappears. At the very least, this precursor program could temper the negative effects on technological deployment that new entrant allowances could have.

New plants may also be a better target than existing plants because EPA has direct authority over new sources, whereas it must go through the states to regulate existing sources (under Section 111(d)). Working through the states will take longer, giving the program less time to be a true precursor. Unfortunately, the partial coverage of such a program will reduce the overall efficiency of this system. Also, this effort would likely be challenged in court by the regulated parties, and while EPA would have a strong case for upholding the regulation, the delay could cut in to the regulation's value as a precursor.

### **A.3. PSD Permitting or Performance Standards as a Bridge**

Performance standards for any power plant or other significant source of emissions could kick start the deployment of cost-efficient technology and will achieve at least temporary emissions reductions. PSD permitting offers EPA the best vehicle to bridge the gap until broader cap-and-trade comes online. Again, new coal power plants could be a particularly attractive target. But EPA can use PSD permitting to regulate any new or modified major emitting facility. EPA can immediately begin to prescribe BACT for carbon dioxide emissions, since EPA has discretion to define carbon dioxide as a "regulated pollutant." As soon as EPA begins regulating other greenhouse gases—including when the recently proposed monitoring rule for greenhouse gases takes effect<sup>710</sup>—BACT for those pollutants can be prescribed as well.

While such performance standards will be incompatible once a cap-and-trade system comes online, such actions may have at least a short-term benefit. However, these actions lose some of their value if Congress and EPA do not correspondingly adjust any emissions cap set in the future. Caps are typically based on historical and projected emissions, as well as on the estimated reductions necessary to achieve the environmental goals. If a cap is based on emissions levels as they existed or were projected before EPA incorporated greenhouse gas BACT into PSD permitting, the supply of emissions permits will remain constant even though demand will have decreased. Since the supply will remain the same, sources that would have otherwise reduced their emissions will not need to do so, and total national emissions will remain unchanged by the application of BACT to greenhouse gas emissions.

EPA's ability to prescribe BACT for new and modified sources is limited by EPA's PSD permitting authority. Most states are responsible for permitting within their own borders, and EPA has only indirect control over some of their permitting decisions. EPA could use new source performance standards to prescribe specific controls for all new sources nationwide. Unfortunately, Section 111 can only be implemented category-by-category: a piecemeal approach not well suited for taking quick action in advance of broader action on climate change.

Whether EPA chooses PSD permitting or new source performance standards, the potential for litigation could interfere with the value of such regulatory actions as a pre-cap bridge. Given EPA's limited resources and the risk that such actions will ultimately have only short-term or no real



effect, it might make most sense for the agency to focus on those regulations that could survive and offer value even after a broader cap-and-trade takes effect.

## **B. Best Options for Supplements**

As explained in Chapter Six, many command-and-control regulations will be detrimental to an efficient and effective cap-and-trade system.<sup>711</sup> However, any cap-and-trade system enacted by legislation or developed under CAA regulations is not likely to exist in the idealized form discussed above. Supplemental regulations are those that will operate compatibly with a realistic model of a cap-and-trade system; they would also provide environmental benefits even in the absence of a cap-and-trade system.

### **Uncovered Sources**

If significant sources of greenhouse gas emissions are not subject to the cap, Clean Air Act regulations could target those emissions without interfering with the cap-and-trade system. Even if sources not covered by a cap-and-trade system would be eligible to generate offset credits for that system, direct regulation of those sources would not be incompatible. For example, under a cap-and-trade system, a landfill may not be subject to the cap, but it may be able to reduce its emissions and sell the offset credits to an entity that needs more emissions allowances. If that landfill were subject to performance standards, it may no longer be able to generate offset credits, because regulations will have already forced it to achieve lower emissions, leaving no room for additional voluntary reductions. As a result, those in need of offset credits will simply search for different sources or achieve the reductions themselves. Such alternate opportunities for reductions may be less cost-efficient than the original reduction at the landfill. But this is not a case of applying performance standards to covered sources, which reduces cost-efficiency without achieving any additional emissions reductions. When the pool of available offsets shrinks, overall emissions will actually be cut. So long as EPA focuses its supplemental regulations on significant sources of greenhouse gas emissions where efficient reductions are possible, the net result will be an efficient decrease in total emissions, compatible with the broader cap-and-trade program.<sup>712</sup>

Similarly, some sources may not be free to utilize the full flexibilities of a cap-and-trade system, if other government regulations constrain their actions. For example, safety regulations may sometimes prevent aircraft from choosing the most fuel-efficient route. Supplemental regulation may help such sources achieve cost-efficient emissions reductions they would otherwise be unable to make on their own.

### **Uncovered Global Warming Agents**

If legislation did not cover any of the six traditional greenhouse gases, separate regulation of those pollutants—either command-and-control or cap-and-trade—would be warranted. Additionally, some pollutants besides the traditional six greenhouse gases have significant effects on global warming. Black carbon may be the second most significant climate factor after carbon dioxide. Many ozone-depleting substances also have extremely high global warming potentials and long lifespans. Nitrogen trifluoride and fluorinated ethers also have high global warming potentials. These pollutants typically are not included in cap-and-trade proposals. While some of these pollutants are already regulated under EPA's CAA authority, the risks they pose to climate change may warrant additional or more stringent regulation.

## **High Transaction Costs or Incomplete Information**

The market may not always be able to identify or reach the most cost-effective opportunities. There will be a role for command-and-control regulations to speed up the deployment of technology that will reduce the overall cost of complying with the cap-and-trade system.

### **B.1. Supplements for New Motor Vehicles and Engines**

While EPA is obligated to prescribe emissions standards for new motor vehicles, other regulatory options are also left to EPA's discretion. Some of them may help supplement any broad cap-and-trade system.

At the outset, it is important to note that any type of command-and-control regulation on the use or sale of fuel in mobile sources—be it a fuel mixing standard, fuel content standard (such as a low carbon fuel standard), or a percentage renewable standard—would reduce the efficiency of a cap-and-trade system for fuels. Any such regulations would require the fuel manufacturing and importing industry, or mobile source manufacturers, to make changes that may not be efficient under a cap-and-trade system and would be redundant, confusing, and ultimately detrimental.

#### **Expand SmartWay Program and Green Vehicle Guide**

The ICTA petition requested EPA to develop standards mandating adoption of hybrid and other clean energy vehicles.<sup>713</sup> Such technologies are already available.<sup>714</sup>

However, as explained, regulations mandating the use of certain technologies or designs will impede a cap-and-trade system. Under a cap-and-trade system, car manufacturers would be incentivized to figure out the cheapest methods to make their fleet use less fuel. The cheapest solution for a particular manufacturer may be something different than changing their design. For example, by switching to a different type of fuel for its cars or by using designs that are different than those EPA mandates. Mandating manufacturers to use specific designs will create more costly solutions to increasing fuel efficiency.

Instead, EPA should provide an information-gathering function, bringing information quickly and efficiently to consumers about the benefits of certain models. First, EPA should expand its SmartWay program—a brand that identifies motor vehicles that reduce transportation-related emissions.<sup>715</sup> SmartWay already covers cars and some heavy trucks, and EPA should expand that program to certify manufacturer designs, engines, and models for all motor vehicles—including automobiles, light trucks, SUVs, heavy trucks, buses, and motorcycles—that are both energy efficient and meet safety regulations.

EPA should also expand and further publicize its Green Guide to Vehicles,<sup>716</sup> which assists consumers in choosing the cleanest and most fuel-efficient vehicle that meets their needs. That Guide already provides a “Greenhouse Gas Score” for each new car model since 2000, and EPA's new GHG monitoring rule will allow more information to be added for post-2010 models.<sup>717</sup> EPA should expand the Green Guide to include all types of motor vehicles, and consider adding telephone support or “Green Guide Counselors” to assist consumers who would like assistance with vehicle choice. EPA could add more information into its Guide once it begins collecting information from manufacturers under the proposed GHG monitoring rule, which will presumably be finalized soon.

EPA could also resume responsibility for and expand its “Best Workplaces for Commuters program,” which partnered with employers and provided commuter benefits to reduce vehicle trips and miles traveled.<sup>718</sup>

Although these informational programs will not be sufficient to qualify as emissions standards that EPA is required to promulgate once it makes the endangerment finding for motor vehicles, these options would be excellent supplements to a cap-and-trade program.

### **Standards for More Efficient Air Conditioners**

A command-and-control regulation for GHG emissions from mobile source air conditioners may be appropriate, even with a cap-and-trade system. Air conditioner systems, which account for 7.5% of GHG emissions from cars, emit GHG in two ways: they directly leak refrigerant—hydrofluorocarbons—into the air, and they increase the car’s electricity load, thus emitting carbon dioxide from the combustion of fuel.<sup>719</sup> Notably, the proposed GHG reporting rule will monitor emissions from motor vehicle air conditioners, including leakage.<sup>720</sup>

Manufactures producing automobiles and trucks have not had the economic or regulatory incentives to reduce HFC refrigerant leakage and carbon dioxide from air conditioning system. A cap on fuel will not incentivize changes to reduce carbon dioxide emissions because air conditioners do not consume fuel in the same proportion as actual transportation use of the vehicle.<sup>721</sup> Therefore, manufacturers will focus technological improvements on reducing fuel consumption during transport.

Additionally, HFC would not be covered by an EPA-created regulatory cap system on vehicle fuel. However, some legislative proposals cover HFC producers and importers, and would therefore cover such emissions. A cap on the sale of HFC would raise prices of HFCs, and automobile manufacturers would be incentivized to decrease leakage from air conditioners, as consumers will be incentivized to buy models with more efficient air conditioners. However, regulation may still be useful if a cap-and-trade system does not raise the price of HFC refrigerant enough to incentivize consumers to purchase car models that have less leaky air conditioners, or manufacturers decide that installing more efficient air conditioners is too expensive.

In 2008, EPA’s ANPR suggested setting standards to reduce carbon dioxide emissions by 40% (at a cost of \$70 per vehicle) and HFC emissions by 75% (at a cost of \$40 per vehicle) by model year 2015, with a phase-in at 2012. Technologies are currently available to achieve these goals.<sup>722</sup> California’s GHG regulation also provides workable options to reduce emissions from air conditioners.<sup>723</sup>

As technologies for reducing emissions from air conditioning units are available now and are fairly inexpensive, EPA should mandate standards requiring that air condition units in motor vehicles work more optimally, leak less, or use an alternate refrigerant.

### **Technology Grants for Carbon Capture at Tailpipe**

Currently, there are no viable technologies for capturing or sequestering carbon emissions from the tailpipe of cars. Depending on restrictions on offsets, including eligibility and quantity, cap-and-trade legislation may not fully incentivize this type of innovation. Therefore if carbon capture or sequester technologies become viable, EPA may consider regulations requiring these designs in motor vehicles. In the meantime, EPA should consider voluntary programs that encourage innovation in this area.

## **B.2. Supplements for Aircraft Engines & Marine Vessels**

As explained in Chapter 5, EPA will be obligated under the CAA to set emissions standards that limit GHG emissions from aircraft and marine vessels—in the form of GHG emissions limitations, fuel efficiency standards, operation improvements, or design efficiency standards. And, as explained, those standards will interact positively with a cap-and-trade system. They would provide useful

supplements to a cap system as those vehicles have the capacity to travel internationally and purchase fuel in countries not subject to a cap.

Additionally, EPA should also institute information programs for aircraft and marine vessels so that it can play a vital role as a facilitator and information-gather.

EPA could expand its SmartWay program to include aircraft and marine vessels, allowing airlines and ship companies—or individual purchasers—to easily and quickly purchase efficient designs that also meet safety standards. EPA could also require all aircraft and marine vessel manufacturers to stamp their aircraft with carbon grams emitted per mile standards or gallons of fuel consumed per mile. EPA could also create a Green Aircraft Guide or a Green Ship Guide, similar to its Green Guide for motor vehicles, to assist airlines in choosing the cleanest and most fuel-efficient vehicle that meets their needs. Additionally, EPA should consult with the FAA and the Coast Guard to reevaluate any safety regulations that may call for certain size or weight specifications in airline or marine design that may now be outdated given these advances in technology and that may actually prevent induction of these new designs.

EPA will be able to implement these programs more swiftly once it begins obtaining information from these sources under the forthcoming GHG emissions monitoring rule.<sup>724</sup> These systems, however, should be internationally accessible. This is especially important in the case of marine vessels since, as mentioned, almost 90% of marine vessels entering the U.S. are foreign-flagged.<sup>725</sup>

### **B.3. Supplements for Other Nonroad Vehicles**

California and ICTA have petitioned EPA to adopt regulations setting emissions standards for on-road vehicles other than marine, aircraft, or locomotives. These petitions suggest command-and-control regulations mandating improved operational controls, more efficient vehicle designs, and fuel economy or fuel content standards mandating the use of low-carbon fuels.<sup>726</sup>

Notably, EPA has discretion to act in this area. As explained in Chapter 2, not only does EPA have the ability to refrain from regulating if it can articulate a justifiable reason, but even if EPA chooses to regulate it can issue “regulations as the Administrator deems appropriate containing standards applicable to emissions.”<sup>727</sup>

EPA should institute informational programs for all vehicles—including motor vehicles, aircraft, marine vessels, and other nonroad applications—in order to **play a vital role as a facilitator and information-gather.**

Once EPA regulates a cap-and-trade system for vehicle fuels, fuels for nonroad vehicles will be included in this system and EPA will have a satisfactory and potent justification that emissions standards for nonroad vehicles would not be appropriate. Because the nonroad vehicles in this category do not travel internationally, unlike marine and aircraft vessels, all fuel purchased to run them will be purchased domestically, and subject to a fuel cap. Therefore, there is no value-added for command-and-control regulations in this area, and command and control regulations may actually interfere with a cap program.

EPA should therefore refrain from issuing outright limitations on GHG emission from these sources, and instead focus on providing a supplementary informational function. That information-gathering function will be more appropriate and beneficial for a cap-and-trade system.

There is room for EPA to play an information gathering role to assist consumers in purchasing nonroad equipment that will consume less fuel, and therefore be cheaper in the long run. EPA should expand its SmartWay and Green Vehicle Guide to include nonroad applications. EPA should also require manufacturers of these vehicles to stamp all their equipment with miles per gallon or hours per gallon specifications, or with carbon emission per mile specifications.

Another option, suggested by the petitions, would be to institute voluntary trade-in programs for vehicles designed to replace an outdated fleet more rapidly. This program could apply to lawnmowers, tractors, and other agricultural equipment and would facilitate the turnover process to more efficient designs.

Further, EPA could increase technology grants to innovators experimenting with electrically run vehicles. Most of these nonroad vehicles will be amenable to battery-chargeable electrical power because they are not used as often as cars or for traveling long distances, and can be charged at home when not in use—for example, snowmobiles, tractors, and riding lawnmowers.

Additionally, there are certain externalities associated exclusively with nonroad vehicles. For example, snowmobiles are often used recreationally in national parks, and emit GHGs in parks. EPA, working with the National Park Service, could set up a system whereby electrically powered snowmobiles would get special permits to operate in national parks.

#### **B.4. Supplements for Stationary Sources**

Despite the fact that Congress has referred to its various legislative proposals on climate change as “economy-wide” cap-and-trade, even the broadest proposals only cover around 87% of total national emissions. It also may not be efficient or possible for EPA to cover all emissions under any regulatory cap-and-trade program. The remaining, uncovered emissions come from some significant source categories that may be appropriate targets for command-and-control regulation.

##### **Industrial Processes**

Many industrial processes release greenhouse gases as a byproduct of physical or chemical reactions, rather than through combustion of fossil fuels for energy production. For example, to produce cement, raw materials like calcium carbonate are chemically transformed by heat, releasing carbon dioxide in the process.<sup>728</sup> Iron and steel production, lime production, nitric acid production, and many other industrial processes collectively generate around 4.5% of national gross greenhouse gas emissions.<sup>729</sup> Such sources will likely not be covered by cap-and-trade.

EPA has been petitioned in the past to apply greenhouse gas standards to such sources under Section 111. Cement manufacturing in particular has been targeted. Regulation of some such source categories may be obligatory, as discussed in Chapter Six. However, EPA retains significant discretion as to the timing and review of standards for already-listed source categories under Section 111, as well as on the addition of new source categories. EPA may want to exercise its discretion to supplement a cap-and-trade system by focusing on otherwise uncovered emissions.

##### **Upstream, Non-Use, and Small Fossil Fuel Emissions**

The exact scope of this category is unclear, as it depends significantly on how the specific cap-and-trade system is designed. For example, under the Lieberman-Warner legislation considered in Congress last term, uncovered sources would include coal mining (which releases methane); residential, commercial, or industrial coal combustion in facilities using less than 5000 tons of coal per year; and emissions that do not directly result from the “use” of fossil fuels, such as the emissions during the production, processing, storage, and distribution of natural gas or

petroleum.<sup>730</sup> Some of these sources may be good candidates for command-and-control regulation under Section 111.

### **Agricultural Processes and Waste**

Agricultural processes like enteric fermentation, manure management, field burning, soil management, and rice cultivation emits 6.4% of national gross greenhouse gas emissions.<sup>731</sup> While control measures do not yet exist for the last two processes, operational controls and capture systems exist for the others.<sup>732</sup>

Landfills generate methane, and wastewater treatment also emits greenhouse gases. Together, waste management accounts for 2.3% of national gross greenhouse gas emissions. Solid waste and methane gas from landfills can be captured and combusted to produce electricity, replacing power otherwise generated from fossil fuels.<sup>733</sup>

Some legislative proposals envision that these sources will become involved in the offset credit process: sources will pay for greenhouse gas reductions through agricultural processes or landfills, and those reductions will be credited toward the sources' allowance requirements. In fact, some legislative proposals plan to give landfills their own allocation of credits, to be sold to fund reduction and sequestration projects.

However, applying performance standards to such sources would not interfere with the offset credit system. If an agricultural or waste source could not generate offset credits because a performance standard already forced it to achieve lower emissions, those in need of offset credits will simply search for different sources or achieve the reductions themselves. Such alternate opportunities for reductions may be less cost-efficient than the original agricultural or waste source reduction. But this is not a case of applying performance standards to covered sources, which reduces cost-efficiency without achieving any additional emissions reductions. When the pool of available offsets shrinks, overall emissions reductions will actually increase. So long as EPA focuses on significant sources of greenhouse gas emissions where efficient reductions are possible, the net result will be an efficient decrease in total emissions.<sup>734</sup>

### **Uncovered Pollutants**

Black carbon and tropospheric ozone are already regulated under the CAA and are not likely to be included in any legislative proposal for cap-and-trade. Tighter restrictions of both pollutants may therefore be compatible with cap-and-trade legislation. For example, particle traps for diesel industrial engines, more efficient kilns and stoves for burning fossil fuels in industrial processes, and cleaner, low-carbon fuel could all help reduce output of black carbon.<sup>735</sup> EPA can use the NAAQS it sets for particulate matter to encourage states to adopt such black carbon regulation. EPA could even develop a model trading program specifically for black carbon under its Section 110(a)(2)(D) authority: as a short-lived, localized pollutant, black carbon does not present the same problems as other greenhouse gases for trading under this section of the CAA. Similarly, EPA could increase the stringency of its ozone NAAQS. Some of these actions will be obligatory, as discussed in Chapter Six. However, EPA retains discretion on when and how stringently to set NAAQS. EPA should exercise that discretion to supplement any cap-and-trade system in place.

EPA may also want to consider whether performance standards or efficiency standards under Section 111 could be useful to control the emission of black carbon, nitrogen trifluoride, fluorinated ethers, or other global warming agents from certain sources.

### **Correcting Market Imperfections and Forcing Technology**

The market is not always able to identify and achieve the most cost-efficient way to reduce emissions. Lack of information or transaction costs prevent a market from operating with optimal

efficiency. For example, while a cap-and-trade system will likely raise the price of electricity and fuel, the higher price will not necessarily guarantee that consumers will take efficient actions. Consider the large commercial kitchen examined above in Chapter Three in the context of PSD permitting. Even if the cost of natural gas goes up under a cap-and-trade system, the restaurant will not necessarily buy the most efficient appliances, improve the overall efficiency of its energy use, or install efficient end-of-pipe controls for emissions. EPA can use PSD permitting to prescribe efficiency standards for such sources. Additionally, EPA can expand its informational programs to help consumers understand their options and make smart choices.

# Conclusion

## EPA Faces Constraints, But Also Opportunities

This Report discusses both the constraints faced by EPA as well as the many potential opportunities that the agency has for regulating greenhouse gases. The Clean Air Act is an incredibly complex statute. Congress had a clear idea of how it wanted to regulate air quality. At the same time, Congress was aware that it did not have access to complete information, and that new scientific discoveries would inevitably call for the agency to move in directions that it could not, at that time, contemplate. For this reason, Congress wisely delegated significant discretionary authority to EPA so that the agency could take appropriate steps as the state of scientific knowledge progressed.

The Act is therefore a delicate balance between prescription and discretion, between absolute clarity and intentional ambiguity. Congress was not willing to give the agency unlimited control over clean air regulation, recognizing the possibility for political capture and the potential need for courts to ensure that certain regulations were pursued. At the same time, flexibility and expertise are also values that underlay the Act's structure, and courts have recognized this intent by giving EPA wide latitude on many questions.

The trick for EPA is to respect the areas where Congress created mandatory responsibilities, while using its discretion to create smart, socially-beneficial regulation. This task will draw on all of the areas of expertise that the agency has developed over the years: scientific, economic, and legal. No matter how well-designed a regulatory regime, if it runs afoul of the statute, then it will be subject to challenge in the courts. But no matter how legally correct, poorly-designed regulation will fail to meet the needs of current and future generations of Americans. Balancing legal obligations with the requirements of good policymaking will be essential to the agency's success.

This Report shows that the agency faces many obligations that can not be avoided. At the same time, the agency can achieve efficient—or nearly efficient—regulation through the creation of a economy-wide cap-and-trade system. Meeting its obligations under the law will not be easy, but the true challenge for the agency will be to step forward with a bold plan to tackle greenhouse gas emissions. This is within the agency's power—it need only exercise its discretion.



# Appendix

## Principles of Administrative Law

This Appendix provides supplemental legal analysis on EPA's discretion under the Clean Air Act.

Which actions EPA must take under the Clean Air Act will turn largely on EPA's discretion to interpret statutory requirements, make judgment calls, and schedule activities according to its own priorities. However, principles of administrative law place limits on EPA's discretion. When considering its legal obligations and options, EPA must be cognizant of the standards for judicial review of its actions. Generally, courts will defer to EPA's determinations but will insist that all interpretations, actions, and response times follow a basic "rule of reason."

### A. Statutory Interpretations

How EPA interprets statutory provisions and phrases—especially terms like "shall" and "as may be appropriate"—will influence which actions are mandatory and which are optional. In light of the Supreme Court's 1984 ruling in *Chevron v. Natural Resources Defense Council*, EPA will have significant but not unlimited discretion to interpret the Clean Air Act.

#### **A.1. Chevron Deference to Agency Interpretations**

The Supreme Court established the standard of review for statutory interpretations in *Chevron v. Natural Resources Defense Council*,<sup>736</sup> and its progeny. Under the *Chevron* test, courts will first look to the plain language of the statute. Courts feel that language is the primary indicator of legislative intent, and "in construing a statute, [courts] must give meaning to all the words in the statute."<sup>737</sup> Courts will sometimes augment this analysis with a review of legislative history or statutory structure, though there is some movement against using such interpretive tools at this stage.<sup>738</sup> "If the intent of Congress is clear, that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress."<sup>739</sup> In other words, when the plain language is "unambiguous," courts give no deference to agency interpretations.<sup>740</sup>

However, frequently the plain language of a statute will be susceptible to multiple interpretations, and the intent of Congress will not be clear. In that case, courts move to step two of the *Chevron* test:

If, however, the court determines Congress has not directly addressed the precise question at issue, the court does not simply impose its own construction on the statute, as would be necessary in the absence of an administrative interpretation. Rather, if the statute is silent or *ambiguous* with respect to the specific issue, the question for the court is whether the agency's answer is based on a *permissible* construction of the statute. . . . [T]he question [is] not whether, in [the court's] view, the concept is 'inappropriate' in the general context of a program designed to improve air quality, but whether the Administrator's view that it is appropriate in the context of this particular program is a *reasonable* one.<sup>741</sup>

When an agency is charged with administration of a statute, if that statute is unclear, then courts will assume Congress intended to grant the agency some flexibility. That flexibility is limited to "reasonable" interpretations of the statute. Courts again frequently invoke legislative history and statutory structure to determine "reasonableness."<sup>742</sup> Notably, courts do not require the "best" interpretation or the most "appropriate" interpretation, but simply "a permissible construction of the statute." This standard is deferential and will sanction any reasonable interpretation of unclear provisions in the Clean Air Act.

## **A.2. The Absurd Results Canon**

When applying certain provisions of the Clean Air Act, EPA may wish to invoke the "absurd results canon" in order to avoid certain undesirable statutory interpretations. Even if the plain statutory language would dictate a particular result, courts sometimes allow agencies to "look beyond the words" to prevent absurd outcomes.<sup>743</sup>

The idea that seemingly absolute statutes must be given exceptions to prevent absurd results is well established in the American legal tradition:

The common sense of man approves the judgment mentioned by Puffendorf, that the Bolognian law which enacted "that whoever drew blood on the streets should be punished with the utmost severity," did not extend to the surgeon who opened the vein of a person who fell down on the street in a fit. The same common sense accepts the ruling, cited by Plowden, that the statute of 1st Edward II, which enacts that a prisoner who breaks prison shall be guilty of a felony, does not extend to a prisoner who breaks out when the prison is on fire – "for he is not to be hanged because he would not stay to be burnt."<sup>744</sup>

More generally, the Supreme Court has ruled that in certain "rare cases" where "literal application of a statute will produce a result demonstrably at odds with the intentions of the drafters," then "the intention of the drafter, rather than the strict language, controls."<sup>745</sup> In particular, courts look to whether literal application of a statute would interfere with the intended congressional mission or would be impossible for the agency to carry out.<sup>746</sup> The D.C. Circuit has held that "literal interpretation need not rise to the level of 'absurdity' before recourse is taken to the legislative history ... [but] there must be evidence that Congress meant something other than what it literally said before a court can depart from plain meaning."<sup>747</sup>

To disregard the plain text, courts require "extraordinarily convincing justification":<sup>748</sup>

For EPA to avoid a literal interpretation at Chevron step one, it must show either that, as a matter of historical fact, Congress did not mean what it appears to have said, or that, as a matter of logic and statutory structure, it almost surely could not have meant it.<sup>749</sup>

The agency's burden of proof under this test is "especially heavy" when seeking "a prospective exemption of certain categories from a statutory command based upon the agency's prediction of the difficulties of undertaking regulation," compared to an exemption sought after first trying to enforce the strict statutory language.<sup>750</sup>

Even if the absurd results canon is satisfied, the agency's statutory interpretation "may deviate no further from the statute than is needed to protect congressional intent."<sup>751</sup> The D.C. Circuit has consistently held that agencies should adopt the "mo[st] narrow solution to the problem" where the agency "cannot show [a broader solution] is needed to implement congressional intent."<sup>752</sup> In short, while the absurd results canon is generally available, courts are hesitant to apply it except in those "rare cases" of "extraordinary justification," and even then courts only allow minimal deviations from the plain text.

### **A.3. "Shall" versus "As May Be Appropriate"**

A recurring issue of statutory interpretation throughout the Clean Air Act is whether the term "shall" always indicates a mandatory duty. Generally, courts feel that "shall" is unambiguously "the language of command,"<sup>753</sup> which "normally creates an obligation impervious to judicial discretion."<sup>754</sup> Indeed, courts have specifically held that "when the Clean Air Act uses 'shall,' the normal inference is that the act is mandatory."<sup>755</sup> However, statutory interpretation is highly case-specific, and there are some notable exceptions. For example, when the statute says the agency "shall" act by a certain date, courts will sometimes grant the word "shall" discretionary connotations in order to permit the agency to take action even after that date has elapsed.<sup>756</sup>

The Clean Air Act frequently juxtaposes the mandatory language of "shall" with discretionary language, such as "as may be appropriate." In *Environmental Defense Fund v. Thomas*, the Second Circuit Court of Appeals had to interpret Section 109(d) of the Clean Air Act, which stated that "not later than December 31, 1980...the Administrator *shall* complete a thorough review of the criteria published under section 108...and promulgate such new standards *as may be appropriate*." EPA argued that the phrase "as may be appropriate" created a wholly discretionary duty to promulgate new standards. The Second Circuit, however, felt the section only granted EPA a limited amount of discretion. While the court could not dictate that EPA make any particular revisions, the court could compel EPA to take some action: "[A]lthough the district court does not have jurisdiction to order the Administrator to make a particular revision, we cannot agree with [EPA] that the Administrator may simply make no formal decision to revise or not to revise, leaving the matter in a bureaucratic limbo."<sup>757</sup> In other words, "it is rudimentary administrative law that discretion as to the substance of the ultimate decision does not confer discretion to ignore the required procedures of decisionmaking."<sup>758</sup>

## **B. Judgment Calls**

The Clean Air Act frequently requires EPA to take certain actions after a finding has been made according to "the Administrator's judgment." When EPA is asked to judge how dangerous a threat is, how significant a pollutant's contribution is, or other similar determinations, courts will grant EPA considerable leeway: "Such decisions require 'the fusion of technical knowledge and skills with judgment, which is the hallmark of duties which are discretionary.'"<sup>759</sup> Courts consider themselves to be poor judges of science, and therefore "give particular deference to . . . EPA when it acts under unwieldy and science-driven statutory schemes like the Clean Air Act."<sup>760</sup>

Again, though, this discretion is limited by a standard of reasonableness. Under standards articulated by both the Administrative Procedure Act and the Clean Air Act, a court can strike down

EPA actions that are “arbitrary and capricious.”<sup>761</sup> The standard is somewhat deferential,<sup>762</sup> and courts will uphold an agency action if the agency “considered the relevant factors and articulated a ‘rational connection between the facts found and the choice made.’”<sup>763</sup> But the mere existence of some discretion does not dilute the agency’s general obligation to follow statutory criteria and explain decisions in reasoned terms. For example, EPA cannot ground its scientific judgments in “a patently unreasonable interpretation of the statute,” nor can it justify delay or inaction “where the agency’s claims of tentativeness in its scientific findings are so clearly contradicted by the record that they amount to bald fabrications.”<sup>764</sup>

The Supreme Court most recently articulated these principles in *Massachusetts v. EPA*. There, the Court said EPA must respond to a public petition and must ground its response in science and in statutory criteria, not in unrelated policy determinations. At the same time, the Court expressed “no doubt [that EPA] has significant latitude as to the manner, timing, content, and coordination of its regulations.”<sup>765</sup>

## C. Deadlines and Delays

While the Clean Air Act contains many explicit deadlines, often the statute requires EPA to take certain actions only “from time to time,” or otherwise does not specify a clear schedule for rulemaking.<sup>766</sup> EPA’s responses to public petitions are also not typically governed by any statutory timetable.<sup>767</sup> For example, any person, organization, or state may petition EPA under the Administrative Procedure Act and request a rulemaking. However, the Administrative Procedure Act gives only a vague description of the petition process: “Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.”<sup>768</sup> Finally, some court orders may not specify a strict schedule for EPA’s compliance. For example, in *Massachusetts v. EPA*, the court clearly stated that, on remand, EPA had discretion to prioritize its own docket of activities.

In such cases, EPA’s delays or inactions can be challenged under various provisions in the Clean Air Act and the Administrative Procedure Act.<sup>769</sup> A good deal of controversy still surrounds the issue of which courts have jurisdiction over which EPA delays.<sup>770</sup> To some extent, the test applied by the court will vary depending on which statutory provision grants jurisdiction and on the type of delay in question.<sup>771</sup> However, all tests share at their core the requirement that agency choices as to timing must be governed by a “rule of reason.”<sup>772</sup>

Whether a court ultimately finds a particular delay to be “unreasonable” is highly fact-specific.<sup>773</sup> For example, the D.C. Circuit did not find a nine-year delay to be unreasonable where EPA faced an “unusual complexity of the factors...in determining the effects of acid rain.”<sup>774</sup> Yet in a case involving the Occupational Health and Safety Administration, the D.C. Circuit found a three-year delay from proposal to finalization of a rule was unreasonable, because the statute had highlighted the “urgency of the need” for such regulation and since the court was confident that the agency could take the required actions without “seriously disrupt[ing] other rulemakings of higher or competing priority.”<sup>775</sup>

Generally courts feel “ill-suited to review the order in which an agency conducts its business” and are hesitant to find unreasonable delay where complex and controversial scientific and policy questions are involved, and where the agency has made progress in its deliberations.<sup>776</sup> Most recently and relevantly, in June 2008, the D.C. Circuit denied a petition seeking a court order for EPA’s compliance with the Supreme Court’s ruling in *Massachusetts v. EPA*. As Judge Tatel noted in a partially concurring opinion, while “a reasonable time for agency action is typically counted in weeks or months, not years,” in no case on record has a court granted mandamus based on agency

delay of only a year.<sup>777</sup> That said, Judge Tatel was willing to question the “indefinite postponement” of a required action.

In sum, EPA will only be safe from challenges to any delays or inactions if it can articulate a clear and honest reason for its decisions as to timing. Many petitions still pending before EPA were submitted several years ago. For example, the petition at the heart of *Massachusetts v. EPA* was submitted in 1999. For some of these petitions, EPA has made little progress in its deliberations, even while the science of the effects of greenhouse gases became increasingly clear. It will be difficult for EPA to justify any additional significant delay on such actions in light of the reasonableness standard.

# Notes

<sup>1</sup> The Clean Air Act is codified at 42 U.S.C. §§ 7401–7671q (2007) [hereinafter CAA]. The Supreme Court held that carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons—the four greenhouse gases emitted by motor vehicles—were “air pollutants” under the Clean Air Act. *Massachusetts v. EPA*, 549 U.S. 497, 528-29 (2007).

<sup>2</sup> A handful of scientists remain skeptical about the reality of global climate change, but their numbers are small and shrinking. See Peter T. Doran & Maggie K. Zimmerman, *Examining the Scientific Consensus on Climate Change*, EOS, TRANSACTIONS, AM. GEOPHYSICAL UNION, Jan. 20, 2009, at 22 (surveying 3,146 earth scientists and finding that of the most-active climatologists, over 97% believe that “human activity is a significant contributing factor in changing mean global temperatures”). The practically unanimous and worldwide agreement on the fundamental existence and danger of climate change is reflected in the work of the United Nation’s Intergovernmental Panel on Climate Change (IPCC), an objective intergovernmental body consisting of hundreds of scientists of various disciplines and nationalities. IPCC, *Climate Change Synthesis Report*, in IPCC FOURTH ASSESSMENT REPORT 30 (2007), available at [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf) [hereinafter IPCC 2007 Report] (“Warming of the climate system is unequivocal.”); see also Naomi Oreskes, *Beyond the Ivory Tower: The Scientific Consensus on Climate Change*, 306 SCIENCE 1686 (2006) (surveying 928 abstracts of peer-reviewed papers and finding none disagreed with the consensus position). But cf. MINORITY STAFF OF S. COMM. ON THE ENV’T & PUB. WORKS, 111TH CONG., MORE THAN 700 INTERNATIONAL SCIENTISTS DISSENT OVER MAN-MADE GLOBAL WARMING CLAIMS (2009) (disagreeing with specific conclusions of the IPCC reports).

<sup>3</sup> See IPCC 2007 Report, *supra* note 2, at 36-41.

<sup>4</sup> See *id.* at 30-31. The effects of ocean acidification due to elevated concentrations of carbon dioxide have also become increasingly apparent. See *id.* at 51-52 (noting in particular the damage to corals caused by ocean acidification).

<sup>5</sup> See *id.* at 48-53; EPA, TECHNICAL SUPPORT DOCUMENT ON BENEFITS OF REDUCING GHG EMISSIONS 17 (2008); EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT AND CAUSE OR CONTRIBUTE FINDING FOR GREENHOUSE GASES UNDER SECTION 202(A) OF THE CLEAN AIR ACT 17-68 (2008), available at [http://epa.gov/climatechange/endangerment/downloads/TSD\\_Endangerment.pdf](http://epa.gov/climatechange/endangerment/downloads/TSD_Endangerment.pdf) (noting effects of GHGs and climate change).

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<sup>6</sup> See Timothy M. Lenton et al., *Tipping Elements in the Earth's Climate System*, 105 PROC. OF THE NAT'L ACAD. OF SCI. 1786 (2008).

<sup>7</sup> See *id.*

<sup>8</sup> EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT, *supra* note 5, at ES-1.

<sup>9</sup> For example, EPA regulates tropospheric ozone and black carbon particulate matter, and international treaties restrict the use of ozone-depleting substances. NAT'L CTR. FOR ENVTL. ASSESSMENT, EPA, No. 600/R-05/004aF, AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS, VOL. I, at E-1, E-32 (2006) (noting regulation of tropospheric ozone under the CAA and the role of ozone as "a potent GHG"); NAT'L CTR. FOR ENVTL. ASSESSMENT, EPA, No. 600/P-99/002aF, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, VOL. I, at 1-1, 4-209, 4-211 (2004) (noting regulation of particulate matter, including black carbon, under the CAA and the role of particulate matter in global warming); JAN FEDOROWICZ, UNITED NATIONS ENV'T PROGRAMME ET AL., THE MONTREAL PROTOCOL: PARTNERSHIPS CHANGING THE WORLD (2005) (noting the global success of reducing ozone-depleting substances under the Montreal Protocol); UNITED NATIONS ENV'T PROGRAMME, ENVIRONMENTAL EFFECTS OF OZONE DEPLETION AND ITS INTERACTIONS WITH CLIMATE CHANGE (2006) (noting the global warming potentials of ozone-depleting substances).

<sup>10</sup> See IPCC 2007 Report, *supra* note 2, at 36-37.

<sup>11</sup> See *id.* (also noting global carbon dioxide concentrations have risen from a pre-industrial value of 280 parts per million to 379 parts per million in 2005).

<sup>12</sup> EPA, 430-R-09-004, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2006, at ES-2-ES-3 (2009), available at <http://www.epa.gov/climatechange/emissions/downloads09/InventoryUSGhG1990-2007.pdf> [hereinafter EPA GHG Inventory]. For example, methane's global warming potential is twenty-one times that of carbon dioxide; sulfur hexafluoride's global warming potential is 23,900 times that of carbon dioxide. *Id.* For this reason, GHG emissions are frequently measured in carbon dioxide-equivalent units.

<sup>13</sup> For example, Germany claims to have cut emissions by over 20% compared to 1990 levels. *Germany Reaches Kyoto Emissions Commitment*, SPIEGEL ONLINE INT'L, Nov. 28, 2008, available at <http://www.spiegel.de/international/germany/0,1518,593296,00.html>. See also SUSAN R. FLETCHER & LARRY PARK, CONG. RESEARCH SERV., NO. RL33826, CLIMATE CHANGE: THE KYOTO PROCESS AND INTERNATIONAL ACTIONS 8 (2007) (noting that Sweden, Switzerland, the United Kingdom, the Netherlands, France, and Germany have made the most progress toward their targets for emissions reductions).

<sup>14</sup> EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT, *supra* note 5, at 1 ("CO<sub>2</sub> and GHGs have global and very long-run implications compared to conventional air pollutants. GHGs, for example, CO<sub>2</sub>, methane, and nitrous oxide, are chemically stable and persist in the atmosphere over time scales of a decade to centuries or longer, so that their emission has a long-term influence on climate. Because these gases are long lived, they become well mixed throughout the atmosphere. Therefore, emissions from the U.S. will contribute to climate change impacts in other countries, and emissions in other countries will contribute to climate change impacts in the U.S.") (citation and quotation omitted).

<sup>15</sup> See JANE A. LEGGETI, CONG. RESEARCH SERV., NO. RL34513, CLIMATE CHANGE: CURRENT ISSUES AND POLICY TOOLS 4-5 (2009) ("China probably is now the leading emitter of human-related GHGs, likely having recently surpassed the United States."); *id.* ("Most experts expect that Chinese . . . emissions will continue to grow more rapidly."); *id.* at 17 ("Current [U.S.] federal climate change policies provide incentives, but few requirements, to reduce GHG emissions."); Letter from the President to Senators Hagel, Helms, Craig, and Roberts (Mar. 13, 2001), available at <http://www.whitehouse.gov/news/releases/2001/03/20010314.html> (expressing President Bush's refusal to submit the Kyoto Protocol to the Senate for ratification).

<sup>16</sup> EPA GHG INVENTORY, *supra* note 12, at figs. ES-1, ES-2 (showing an increase from 6099 million metric tons of carbon dioxide-equivalent emissions in 1990 to 7150 million metric tons in 2007).

<sup>17</sup> *Massachusetts v. EPA*, 549 U.S. at 528-29.

<sup>18</sup> For further discussion of limits on EPA's discretion see the Appendix.

<sup>19</sup> Though public concern over global warming has dropped slightly in recent months, energy independence remains a top priority. See Andrew C. Revkin, *Environmental Issues Slide in Poll of Public's Concern*, N.Y. TIMES, Jan. 22, 2009 ("A new poll suggests that Americans, preoccupied with the economy, are less worried about

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rising global temperatures than they were a year ago but remain concerned with solving the nation's energy problems. . . . 'Protecting the environment' . . . had surged in the rankings from 2006 to 2008 . . .").

<sup>20</sup> In 1997, the U.S. Senate unanimously voted in opposition to any international treaty with mandatory greenhouse gas controls. S. Res. No. 98, 105th Cong. (1997). In 2003, the first cap-and-trade legislation in the Senate was rejected on a vote of 43-55. Roll Call Vote on S. Amdt. 2028 to S. 139, 108th Cong. (Oct. 30, 2003). In 2005, the Senate passed a non-binding resolution in favor of mandatory climate action. S. Amdt. 866, 109th Cong. (2005) (Sense of the Senate). In the 2007-2008 term, Congress introduced well over 200 bills related to climate policy, up from 106 the previous term: one Senate bill was successfully moved through committee, though the bill's proponents ultimately failed to get the 60 votes needed to move the legislation passed a procedural vote on the floor (the tally was 48-36). See generally Pew Ctr. on Global Climate Change, Legislation in the 110<sup>th</sup> Congress, [http://pewclimate.org/what\\_s\\_being\\_done/in\\_the\\_congress/110thcongress.cfm](http://pewclimate.org/what_s_being_done/in_the_congress/110thcongress.cfm) (last visited Apr. 20, 2009).

<sup>21</sup> For example, Senator Barbara Boxer, chair of the Senate Committee on Environment and Public Works, has called her work on climate change "the greatest legislative accomplishment of my political career." Press Release, Senator Barbara Boxer, Boxer Says Passage of Historic Global Warming Bill "Puts the Wind at Our Backs," (Dec. 5, 2007) (available at <http://www.boxer.senate.gov/news/releases/record.cfm?id=288401>). Senator Joe Lieberman, Senator John McCain, Representative Nancy Pelosi, and others have also played leading roles in moving climate change legislation through Congress.

<sup>22</sup> See, e.g., John Orr, *McCain and Obama: Comparing Energy, Climate Change Policies*, COLO. INDEP., Sept. 29, 2008 ("Energy policy is near the top of the list of issues for most [voters].").

<sup>23</sup> For example, Obama's budget proposal for Fiscal Year 2010 anticipates the creation of a GHG cap-and-trade program that will generate nearly \$650 billion in auction revenues by 2019. OFFICE OF MGMT. & BUDGET, WHITE HOUSE, A NEW ERA OF RESPONSIBILITY RENEWING AMERICA'S PROMISE, tbl. S6 (2009), available at [http://www.whitehouse.gov/omb/assets/fy2010\\_new\\_era/A\\_New\\_Era\\_of\\_Responsibility2.pdf](http://www.whitehouse.gov/omb/assets/fy2010_new_era/A_New_Era_of_Responsibility2.pdf) (laying out "Total Climate Revenues" gained from auctioning permits from 2010-2019). The proposed cap-and-trade program would auction all permits and set an emission target requiring GHG emission reductions of 14 percent below 2005 levels by 2020 and 83 percent below 2005 levels by 2050. *Id.* at 21. Of the auction proceeds, \$150 billion would be used to fund clean energy technologies over 10 years beginning in 2012, and the balance would be "returned to the people, especially vulnerable families, communities, and businesses to help the transition to a clean energy economy." *Id.*

<sup>24</sup> See Darren Samuelsohn, *Obama Prefers Congress to EPA When It Comes to Emission Cuts* – Browner, E&E DAILY NEWS, Feb. 23, 2009.

<sup>25</sup> See Darren Samuelsohn, *House Turf Lines Still Fuzzy on Emissions Bill*, E&E DAILY NEWS, Mar. 27, 2009.

<sup>26</sup> See Darren Samuelsohn, *Cap-and-Trade Advocates Press on After Budget Battle*, E&E DAILY NEWS, Apr. 3, 2009.

<sup>27</sup> To eliminate all threat of a filibuster by Senators opposed to climate change legislation, proponents need a 60-vote majority to invoke cloture and close debate. Currently analysts feel 35 Senators strongly support climate change legislation, 10 will probably support it, 23 are undecided, and 32 are likely or definitely opposed. Darren Samuelsohn, *Senate Climate Debate: The 60-Vote Climb*, E&E DAILY NEWS, Apr. 3, 2009. Many climate change leaders in the Senate, like Bernie Sanders (I-Vt), worry that they currently lack the 60-vote supermajority. See Darren Samuelsohn, *Cap-And-Trade Advocates Press on After Budget Battle*, *supra* note 26. In the House, proponents have more confidence that the simple majority vote needed in the chamber is achievable. *Id.*

<sup>28</sup> See Interview by Monica Trauzzi, Managing Editor, E&E TV, with Yvo de Boer, executive secretary of the United Nations Framework Convention on Climate Change (Mar. 30, 2009) ("[W]e're really happy to see the United States back into the international climate change process. . . . [W]e need that U.S. engagement . . . to come to really a global deal at the end of this year to move action on climate change forward.").

<sup>29</sup> The United States signed the Kyoto Protocol in 1998, but the Senate never ratified the agreement, and President Bush refused to pursue any mandatory commitments that did not also cover developing countries (as the Kyoto Protocol did not). See FLETCHER & PARK, *supra* note 13, at 2. President Bush did participate in several international meetings on climate change, including the Asia-Pacific Partnership and G-8 meetings,



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but ultimately all international initiatives were characterized by a “continuing rejection of mandatory limits in favor of ‘aspirational goals.’” *Id.* at 20.

<sup>30</sup> See *id.* at 8-9 (noting that Sweden, Switzerland, the United Kingdom, the Netherlands, France, and Germany have made some progress, but most of Europe, Canada, and Japan are having trouble meeting their targets for emissions reductions).

<sup>31</sup> See United Nations Framework Convention on Climate Change, <http://unfccc.int/2860.php> (showing the “Countdown to Copenhagen”).

<sup>32</sup> See Darren Samuelsohn, *International Pressure Builds for U.S. to Lead on Emissions*, E&E DAILY NEWS, Mar. 4, 2009 (“‘You can’t go to Copenhagen and mumble,’ countered Yvo de Boer, the executive secretary of the UNFCCC. ‘There has to be a clear answer. . . . There has to be a clear commitment to emission reduction targets on the part of industrialized countries.’”).

<sup>33</sup> U.S. CONST. art. II §2.

<sup>34</sup> See discussion *supra* note 27 (describing Senate vote counting).

<sup>35</sup> See Michael D. Ramsey, *Executive Agreements and the Non(Treaty) Power*, 77 N.C. L. REV. 133 (1998) (explaining the contours of the President’s power to undertake international obligations through non-treaty executive agreements); John C. Yoo, *Law as Treaties?: The Constitutionality of Congressional-Executive Agreement*, 99 MICH. INT’L L. REV. 757 (2007) (defending the constitutionality of congressional enactments of international agreements as statutes).

<sup>36</sup> 122 CONG. REC. S12476 (daily ed. July 26, 1976) (statement of Sen. Goldwater).

<sup>37</sup> 549 U.S. at 528-29.

<sup>38</sup> *Id.* at 533-34.

<sup>39</sup> *Id.* at 521.

<sup>40</sup> Clean Air Act Amendments of 1970, Pub. L. No. 91-6054, 84 Stat. 1676 [hereinafter CAA of 1970]; Clean Air Act Amendments of 1977, Pub. L. No. 95-95, 91 Stat. 712 [hereinafter CAA of 1977]; Clean Air Act Amendments of 1990, Pub. L. No. 101-549, 104 Stat. 2468 (2007) (codified as amended at Clean Air Act §§ 101-618, 42 U.S.C. §§ 7401-7671q) [hereinafter CAA of 1990].

<sup>41</sup> *E.g.*, CAA § 101(b)(1) (“The purposes of this title are to protect and enhance the quality of the Nation’s air resources so as to promote the public health and welfare . . .”).

<sup>42</sup> CAA § 302(h) (emphasis added).

<sup>43</sup> See CAA §§ 101-192.

<sup>44</sup> See CAA §§ 201-250.

<sup>45</sup> CAA § 302(g).

<sup>46</sup> For a history of the EPA’s changing opinion on whether GHGs counted as “air pollutants,” see *Massachusetts v. EPA*, 549 U.S. at 510-11 (discussing how in 1998, EPA’s general counsel had concluded that the CAA authorized EPA to regulate GHG emissions from motor vehicles, and in 1999, a second general counsel reiterated this testimony).

<sup>47</sup> See *id.* at 528-29; see also *infra* Chapter 1(B).

<sup>48</sup> See CAA §§ 401-416. Another Title IV, never officially repealed when the Acid Rain title was added in 1990, dealt with noise pollution.

<sup>49</sup> See CAA §§ 501-507.

<sup>50</sup> See CAA §§ 601-618.

<sup>51</sup> Regulating Greenhouse Gas Emissions under the Clean Air Act; Advanced Notice of Proposed Rulemaking, 73 Fed. Reg. 44,354, 44,434 (July 11, 2008) (to be codified at 40 C.F.R. ch. I) [hereinafter EPA 2008 ANPR].

<sup>52</sup> See *id.* at 44,433 (explaining that Title II authorizes or requires EPA to set technology-forcing standards); *Train v. Natural Resources Defense Council*, 421 U.S. 60, 62, 90 (1975) (explaining the “technology-forcing nature” of the CAA 1970 Amendments and of Section 111 in particular).

<sup>53</sup> See CAA § 114.

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<sup>54</sup> See *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. on Env't & Pub. Works*, 110th Cong. (2008) (statement of Mary Nichols, chair, California Air Resources Board) [hereinafter Nichols Testimony].

<sup>55</sup> See, e.g., CAA §§ 111(g) (providing state governors may petition for regulations), 112(b)(3) (providing the public the right to petition to list substances as hazardous air pollutants), 602(c)(3) (providing the public the right to petition to add substances to the list of monitored pollutants).

<sup>56</sup> See Administrative Procedure Act, 5 U.S.C. § 553(e) (2007) ("Each agency shall give an interested person the right to petition for the issuance, amendment, or repeal of a rule.").

<sup>57</sup> See Nichols Testimony, *supra* note 54.

<sup>58</sup> A "motor vehicle" is defined as "any self-propelled vehicle designed for transporting persons or property on a street or highway." CAA § 216(2).

<sup>59</sup> See, e.g., CAA § 202(b)(1)(A) (setting specific emissions standards for carbon monoxide and hydrocarbon emissions from motor vehicles model years 1977-79).

<sup>60</sup> Additionally, section 206 (a)(1) charges EPA with testing new motor vehicles to ensure that each vehicle's emissions will comply with federal emissions standards throughout its "useful life," and with setting regulations to that effect. Before a manufacturer may introduce a new motor vehicle into commerce, it must obtain an EPA certificate indicating compliance with the requirements of the Act and applicable regulations. It submits an application containing test data and other information specified by EPA, which issues a certificate if the manufacturer has shown, among other things, that the vehicle's emissions control systems will achieve compliance with emissions standards over the vehicle's full useful life. 40 C.F.R. § 86.1848-01 (2008).

<sup>61</sup> Some argue that EPA could still exercise discretion not to regulate even after it makes a positive endangerment finding under section 202(a). See, e.g., R. Andrew Schwentker, *Mandating Unfunded Mandates? Agency Discretion in Rulemaking After Massachusetts v. EPA*, 76 GEO. WASH. L. REV. 1444, 1455 (2008) (arguing EPA may be able to use funding concerns to decide not to regulate after making a finding under section 202). This argument, however, is contrary to the statutory provision's language.

<sup>62</sup> CAA § 202(a)(2) (providing that standard may not take effect until "after such period as the Administrator finds necessary to permit the development and application of the requisite technology, giving appropriate consideration to the cost of compliance within such period.").

<sup>63</sup> See EPA 2008 ANPR, 73 Fed. Reg. at 44,354.

<sup>64</sup> See, e.g., Control of Air Pollution from Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, 65 Fed. Reg. 6698 (Feb. 10, 2000) (codified at 40 C.F.R. pts. 80, 85, 86) (setting tailpipe emissions standards for all passenger vehicles beginning in 2004). EPA set two tiers of emission standards for light-duty passenger vehicles. The Tier 1 standard was adopted in 1991 and was phased in from 1994 to 1997. That standard covered vehicles with a gross vehicular weight rating (GVWR) below 8,500 pounds and was divided into five categories: one for passenger cars, and four for light-duty trucks (which include SUVs and minivans) divided up based on the vehicle weight and cargo capacity. Tier II standards were phased in from 2004 to 2009. Instead of basing emissions on vehicle weight, Tier II standards are divided into eleven "bins," with bin 1 being the cleanest (Zero Emission Vehicle) and 11 the dirtiest (with Bins 9-11 being temporary). Only the first ten bins are used for light-duty vehicles below 8,500 pounds GVWR, but medium-duty passenger vehicles up to 10,000 pounds GVWR and can be classified into all 11 bins. Manufacturers can make vehicles which fit into any of the available bins, but still must meet average targets for their entire fleets. *Id.*; see also CONG. RESEARCH SERV., NO. RS20247, EPA'S TIER 2 PROPOSAL FOR STRICTER VEHICLE EMISSION STANDARDS: A FACT SHEET (1999).

<sup>65</sup> See, e.g., 65 Fed. Reg. 6,698 (setting Tier 2 average pollutant emissions standards).

<sup>66</sup> See *Massachusetts v. EPA*, 549 U.S. at 510 (explaining procedural history of the petition).

<sup>67</sup> EPA GHG Inventory, *supra* note 12, at ES-17. The sector is also responsible for about one-third of U.S. carbon dioxide emissions. Over 60% of these carbon dioxide emissions are attributable to gasoline consumption for personal vehicle use. *Id.* at ES-8.

<sup>68</sup> *Id.* at 2-20, 2-21. Over the next 25 years, transportation is expected to drive all the projected growth in total petroleum consumption in the United States. Energy use for transportation is projected to grow by 0.5%

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per year from 2007 to 2030. ENERGY INFO. ADMIN., No. DOE/EIA-0383 ANNUAL ENERGY OUTLOOK 2009 62, available at [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2009\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf).

<sup>69</sup> EPA GHG Inventory, *supra* note 12, at 2-20, 2-21.

<sup>70</sup> Notice of Denial of Petition for Rulemaking, 68 Fed. Reg. 52,922, 52,925 (Sept. 8, 2003). This decision was contrary to previous EPA's statements. In 1998, EPA's general counsel had concluded that the CAA authorized EPA to regulate GHG emissions from motor vehicles, and in 1999, a second general counsel reiterated this testimony. See *Massachusetts v. EPA*, 549 U.S. at 510-11.

<sup>71</sup> 68 Fed. Reg. at 52,930.

<sup>72</sup> *Id.* at 52,931-33.

<sup>73</sup> *Massachusetts v. EPA*, 415 F.3d 50 (D.C. Cir. 2005), *rev'd* 549 U.S. 497 (2007).

<sup>74</sup> 549 U.S. at 497.

<sup>75</sup> EPA argued that Massachusetts did not have standing to bring the challenge. The Supreme Court disagreed, and endorsed the view that partial solutions to the problem of global warming are valid:

Its argument rests on the erroneous assumption that a small incremental step, because it is incremental, can never be attacked in a federal judicial forum. Yet accepting that premise would doom most challenges to regulatory action. Agencies, like legislatures, do not generally resolve massive problems in one fell regulatory swoop. They instead whittle away at them over time, refining their preferred approach as circumstances change and as they develop a more-nuanced understanding of how best to proceed. That a first step might be tentative does not by itself support the notion that federal courts lack jurisdiction to determine whether that step conforms to law. And reducing domestic automobile emissions is hardly a tentative step.

*Id.* at 524 (internal citations omitted).

<sup>76</sup> *Id.* at 521 (quoting expert testimony from scientists).

<sup>77</sup> *Id.* at 529 ("Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt 'physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air.'") (quoting 302(g)); *id.* at 523 ("Because greenhouse gases fit well within the Clean Air Act's capacious definition of 'air pollutant,' we hold that EPA has the statutory authority to regulate the emission of such gases from new motor vehicles.").

<sup>78</sup> *Id.*

<sup>79</sup> *Id.* at 531-32. See Chapter Six for a discussion of how fuel efficiency standards may interact with potential GHG emission standards.

<sup>80</sup> 549 U.S. at 532.

<sup>81</sup> *Id.*

<sup>82</sup> *Id.* at 533.

<sup>83</sup> *Id.* at 534. In September 2007, the D.C. Circuit issued an order requiring EPA to take action consistent with the Supreme Court's decision. *Massachusetts v. EPA*, 249 Fed. Appx. 829 (D.C. Cir. 2007).

<sup>84</sup> *Id.* at 533 ("EPA no doubt has significant latitude as to the manner, timing, content, and coordination of its regulations with those of other agencies. But once EPA has responded to a petition for rulemaking, its reasons for action or inaction must conform to the authorizing statute.") (citations omitted).

<sup>85</sup> On April 2, 2008, the one year anniversary of the Supreme Court decision, seventeen states, local government entities, and environmental groups filed suit in the D.C. Circuit to require EPA to make the endangerment finding—either positive or negative—within 60 days of a court order. The Court declined to issue a writ of mandamus against EPA. *Massachusetts v. EPA*, No. 03-1361 (D.C. Cir. June 26, 2008). A three-judge D.C. Circuit panel denied the request in a one-sentence order that did not give a reason for the denial. However, Judge David Tatel, one of the panel judges, issued a statement concurring in part and dissenting in part. In concurring, Judge Tatel noted that neither the Supreme Court decision nor the subsequent remand required a specific deadline with which EPA must comply. In dissenting, Judge Tatel stated that the petition for a writ of mandamus should be held in abeyance while the court directed EPA to file a detailed compliance schedule, including quarterly progress reports. *Id.*

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<sup>86</sup> See President George W. Bush, Address on CAFE and Alternative Fuel Standards, White House Rose Garden, Washington, D.C. (May 14, 2007), *available at* <http://georgewbush-whitehouse.archives.gov/news/releases/2007/05/20070514-4.html>.

<sup>87</sup> Exec. Order No. 13,432 § 3, 72 Fed. Reg. 27,715 (May 16, 2007) (Cooperation Among Agencies in Protecting the Environment with Respect to Greenhouse Gas Emissions from Motor Vehicles, Nonroad Vehicles, & Nonroad Engines).

<sup>88</sup> Consolidated Appropriations Act of 2008, Pub. L. No. 110-161, 121 Stat. 1844, 2128 (2008). The Act also set a deadline of 18 months to enact final regulations.

<sup>89</sup> Letter from Chairman Henry A. Waxman to EPA Administrator Stephen L. Johnson, at 3-6 (Mar. 12, 2008), *available at* <http://oversight.house.gov/documents/20080312110250.pdf>.

<sup>90</sup> *Id.*

<sup>91</sup> See *id.* at 6 (noting evidence that Johnson decided to exclude findings on the endangerment to public health against the recommendations of EPA scientists); see also EPA, Proposed Endangerment Finding for Greenhouse Gases in Response to *Massachusetts v. EPA*; Guidance-Option Selection Briefing, at 7 (Mar. 6, 2009) (explaining details of 2007 draft finding).

<sup>92</sup> *Id.* at 6. The draft defined “air pollution” as the total collective elevated concentrations of all six main GHGs. The proposal invited comment on whether the other three GHGs emitted from motor vehicles—methane, nitrous oxide, and hydrofluorocarbons—cause or contribute to the air pollution. *Id.*; see also Letter from Waxman, *supra* note 89, at 6.

<sup>93</sup> See Telephone Interview by H. Select Comm. on Energy Independence & Global Warming, 110th Cong., with Jason Burnett, former Senior Policy Advisor, Office of Air & Radiation, EPA (July 15, 2008) (“Interview with Jason Burnett”), *available at* <http://media.washingtonpost.com/wp-srv/nation/documents/burnett071808.pdf>. The White House’s position was that its sudden change in policy was necessitated by the pending congressional energy legislation.

<sup>94</sup> H. SELECT COMM. ON ENERGY INDEP. & GLOBAL WARMING MAJORITY STAFF, 110TH CONG., INVESTIGATION OF THE BUSH ADMINISTRATION’S RESPONSE TO *MASSACHUSETTS v. EPA* 2 (2008). In particular, Vice President Cheney’s energy advisor, F. Chase Hutto, and Office of Management and Budget General Counsel, Jeffrey Rosen, were most vocal in their opposition to regulation; and Exxon Mobile, the American Petroleum, and the National Petrochemical and Refiners Association had made their opinions known to EPA and the White House. See Darren Samuelsohn, *Former EPA Official Details White House Retreat on GHG Regs*, E&E DAILY NEWS, July 18, 2008.

<sup>95</sup> Interview with Jason Burnett, *supra* note 93, at 41. Jason Burnett, a former associate deputy administration of EPA, resigned his position in 2008 over frustrations with political interference in EPA’s work on climate change. See *id.*

<sup>96</sup> *Id.* at 41-42.

<sup>97</sup> EPA 2008 ANPR, 73 Fed. Reg. 44,354. The ANPR begins with a statement from the President’s Office of Management and Budget that, due to interagency disagreement about EPA’s proposed draft ANPR circulated internally on June 17, 2008, EPA Administrator agreed to withdraw the draft and to publish the draft under a statement that it did not represent Administration policy. *Id.* at 44,355. In addition to publishing an ANPR without an approved statement of proposed EPA policy, the ANPR included the letters of other federal agencies criticizing EPA’s draft ANPR. All of the federal agencies stated as a basic premise the difficulty, if not impossibility, of using the Clean Air Act to regulate GHG emissions or to address global warming issues. *Id.* at 44,361-96.

<sup>98</sup> *Id.* at 44,396-98.

<sup>99</sup> *Id.* at 44,339.

<sup>100</sup> *Id.* at 44,398-99.

<sup>101</sup> Some legal experts argue EPA made an official positive endangerment finding for GHGs from motor vehicles in its March 2008 denial of California’s request for a rulemaking waiver, see *infra* Chapter 1(C), because that denial specifically stated that GHG emissions, including from motor vehicles, contribute to global warming. See, e.g., *Massachusetts v. U.S. EPA Part II: Implications of the Supreme Court Decision: Hearing*

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*Before the H. Select Comm. on Energy Independence & Global Warming*, 110th Cong. (2008) (statement of Lisa Heinzerling, Professor of Law, Georgetown University Law Center ). In the denial, published after notice-and-comment procedures, Administrator Johnson endorsed the conclusion of the IPCC that global warming “is unequivocal and is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global sea level.” California State Motor Vehicle Pollution Control Standards; Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 73 Fed. Reg. 12,156, 12,165 (Mar. 6, 2008). Johnson also catalogued the diverse dangers that such warming will pose to public health and welfare. For example, he specifically found that “[s]evere heat waves are projected to intensify in magnitude and duration over portions of the U.S. where these events already occur, with likely increases in mortality and morbidity, especially among the elderly, young, and frail.” *Id.* at 12,167. This sounds very similar to a determination that GHGs are reasonably anticipated to endanger public health or welfare.

<sup>102</sup> Compare EPA 2008 ANPR, 73 Fed. Reg. 44,354, with Notice of Denial of Petition for Rulemaking, 68 Fed. Reg. 52,922, 52,931 (Sept. 8, 2003) (stating that motor vehicle GHG emissions standards now would “result in an inefficient, piecemeal approach to addressing the climate change issue . . . . A sensible regulatory scheme would require that all significant sources and sinks of GHG emissions be considered in deciding how best to achieve any needed emission reductions.”). See *Massachusetts v. EPA*, 549 U.S. at 533-34 (rejecting EPA’s argument that an aversion to “piecemeal” regulation warrants inaction on motor vehicle emissions).

<sup>103</sup> *Id.* at 531-32.

<sup>104</sup> Mandating Reporting of Greenhouse Gases; Proposed Rule, 74 Fed. Reg. 16,448 (Apr. 10, 2009) (to be codified at 40 C.F.R. pts. 86, 87, 89, 90, 94, 98, 600, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1065). EPA will accept public comment on the rule for 60 days and hold two hearings.

<sup>105</sup> This mandate was issued in the 2008 Consolidated Appropriations Act. See *supra* note 88.

<sup>106</sup> EPA included these other fluorinated gases (which are used in electronics, in anesthetics, as heat transfer fluids, and in many cases as substitutes for HFCs), because they are long-lived in the atmosphere and have high global warming potential. 74 Fed. Reg. at 16,464. EPA seeks to understand the emissions and uses of these gases, particularly as those uses expand. The draft rule does not include monitoring requirements for water vapor, CFCs, HCFCs, halons, tropospheric ozone, and black carbon. *Id.*

<sup>107</sup> For example, facilities containing electrical generation units and those manufacturing chemicals, cement, aluminum or certain electronics. *Id.*

<sup>108</sup> *Id.* at 16,461-62. These emissions could be from stationary fuel combustion or a wide variety of source categories, including food processing, industrial landfills, iron and steel production, and pulp and paper manufacturing. Facilities with emissions from stationary fuel combustion sources only (e.g., non-industrial facilities) are only required to report if their maximum rated heat input capacity is 30 million Btu/hour or more. *Id.* The vast majority of small businesses would not be required to report their emissions because their emissions fall well below the threshold.

<sup>109</sup> These reporting rules apply to basically all mobile sources covered by the CAA. See *id.* at 16,450.

<sup>110</sup> *Id.* at 16,454-55. Section 114(a)(1) of the CAA authorizes the Administrator to, *inter alia*, require certain persons to keep records, make reports, undertake monitoring, sample emissions, or provide such other information as the Administrator may reasonably require. This information may be required of any person who (i) owns or operates an emission source, (ii) manufactures control or process equipment, (iii) the Administrator believes may have information necessary for the purposes set forth in this section, or (iv) is subject to any requirement of the Act (except for manufacturers subject to certain title II requirements). The information may be required for the purposes of developing an implementation plan; an emission standard under sections 111, 112 or 129; determining if any person is in violation of any standard or requirement of an implementation plan or emissions standard; or “carrying out any provision” of the Act (except for a provision of title II with respect to manufacturers of new motor vehicles or new motor vehicle engines). Section 208 of the CAA provides EPA with similar broad authority regarding the manufacturers of new motor vehicles or new motor vehicle engines, and other persons subject to the requirements of parts A and C of Title II.

<sup>111</sup> See *id.* at 16,456.

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<sup>112</sup> Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Proposed Rule (prepublication copy April 17, 2009) (to be codified at 40 C.F.R. ch. 1), *available at* <http://epa.gov/climatechange/endangerment/downloads/GHGEndangermentProposal.pdf> [hereinafter Proposed Endangerment Finding]. EPA classified this action under Executive Order 12,866, 58 Fed. Reg. 51,735 (Oct. 4, 1993), as a “significant regulatory action” because it raises novel policy issues. *See* Proposed Endangerment Finding, *supra* note 112, at 126. Accordingly, EPA submitted this action to the White House Office of Management and Budget for review, presumably along with a cost-benefit analysis.

<sup>113</sup> *See id.* at 50-69, 101-104.

<sup>114</sup> *See id.* at 101-06

<sup>115</sup> *See id.* at 69-100 (detailing effects on public welfare and health).

<sup>116</sup> *See id.* at 101-103.

<sup>117</sup> *See* Appendix for a legal analysis of this obligation.

<sup>118</sup> CAA § 209(a).

<sup>119</sup> *See Engine Mfrs. Ass’n v. EPA*, 88 F.3d 1075, 1080 n.9 (D.C. Cir. 1996); *Motor & Equip. Mfrs. Ass’n v. EPA*, 627 F.2d 1095, 1108-11 (D.C. Cir. 1979).

<sup>120</sup> H.R. REP. NO. 95-294, at 301-02 (1977); *see also Motor Equip. Mfrs. Ass’n v. Nichols*, 142 F.3d 449, 453 (D.C. Cir. 1998).

<sup>121</sup> *See* CAA § 209(b) (applying to any “state which has adopted standards . . . for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1996”). This provision applied only to California because it was the only state with such standards at that time.

<sup>122</sup> *See* CAA § 177 (providing that states may adopt and enforce standards identical to those of California, and giving regulated entities a two-year lead time).

<sup>123</sup> CAA § 209(b); *see also Motor & Equip. Mfrs. Ass’n v. Nichols*, 142 F.3d at 453 (stating that EPA must grant waiver request unless these conditions are met).

<sup>124</sup> *Motor & Equipment Mfrs. Ass’n v. EPA*, 627 F.2d at 1108-1111.

<sup>125</sup> *See* Ann E. Carlson, *Federalism, Preemption, and Greenhouse Gas Emissions*, 37 U.C. DAVIS. L. REV. 281, 293 (2003).

<sup>126</sup> *See* Cal. Health & Safety Code § 43018.5 (2003). In 2002, the California legislature found that global warming was a matter of increasing concern for public health and environment in the state; that control and reduction of GHG emissions were critical to slowing the effects of global warming; and that passenger vehicles and light-duty trucks were responsible for 40% of the total GHG pollution in the state. The legislature then enacted Assembly Bill 1493, which required the California Air Resources Board (CARB) to “develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of greenhouse gas emissions from motor vehicles” no later than January 1, 2005, applicable to motor vehicles beginning with the 2009 model year. *Id.* § 43018.5(a)-(b). The statute required CARB to develop its regulations taking into account the technical feasibility of implementing the regulations within the time frames provided, as well as “environmental, economic, social, and technological factors.” *Id.* § 43018.5(c).

<sup>127</sup> *See* Cal. Code Regs. tit. 13, § 1961.1 (2005).

<sup>128</sup> *Id.* § 1961.1(a). Manufacturers may receive credits for meeting the standards before model year 2009 or for surpassing the standards in later years, and for improving the hydrofluorocarbons leakage from their air conditioning systems. These credits may be banked for later use, transferred between vehicle categories or sold to another manufacturer. If a manufacturer fails to meet the standard in a particular model year, it will begin to accrue debits; at that point, it will have 5 years to make up for the debits, either by generating credits, or by purchasing credits from another company. The regulation also accounts for “upstream” or well-to-tank emissions: for example, emissions associated with the production and transport of fuels and emissions associated with electricity generated for electric vehicles. The regulations set the declining standards for manufacturers into two phases: near-term standards phased in from 2009 through 2012, and mid-term standards, phased in from 2013 through 2016. *Id.*

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CARB noted that the technical modifications to meet the standard will increase the cost of new vehicles; but since these technologies will also reduce the operating costs of the vehicles, the regulations will result in an overall small positive effect on the California economy. See CALIFORNIA AIR RESOURCES BOARD, FACT SHEET: CLIMATE CHANGE EMISSIONS CONTROL REGULATIONS 2-4 (2004), available at [http://www.arb.ca.gov/cc/ccms/factsheets/cc\\_newfs.pdf](http://www.arb.ca.gov/cc/ccms/factsheets/cc_newfs.pdf).

<sup>129</sup> *Id.* at 3.

<sup>130</sup> Letter from Catherine Witherspoon, Executive Officer, CARB, to Stephen L. Johnson, Administrator, EPA, Regulations to Control Greenhouse Gas Emissions From Motor Vehicles; Request for Waiver of Preemption Under Clean Air Act Section 209(b) (Dec. 21, 2005), available at <http://www.calcleancars.org/news/PresidentBushARB.pdf>.

<sup>131</sup> EPA was slow to respond to the waiver request even after the Supreme Court issued *Massachusetts v. EPA*. Later California and other states sued EPA to force a decision on the waiver request. *California v. EPA*, No. 07-02024, 2007 WL 3340176 (D.D.C., filed Nov. 8, 2007); see also 28 Env'tl. Litig. R. 3 (Dec. 12, 2007).

<sup>132</sup> The following states have adopted California's GHG regulations: Arizona, Connecticut, Florida, Maine, Maryland, Massachusetts, New Mexico, New Jersey, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington. Florida announced plans to adopt the standards, and Colorado, Minnesota, Montana, North Carolina, and Utah are actively considering similar proposals. See New America Foundation, Climate Policy Program: Transportation Policies, [http://www.newamerica.net/programs/climate/building\\_blocks/transportation](http://www.newamerica.net/programs/climate/building_blocks/transportation) (last visited Apr. 21, 2009).

<sup>133</sup> The first decision was issued by the U.S. District Court for the District of Vermont in *Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie*, 508 F. Supp. 2d 295 (D. Vt. 2007) (upholding Vermont regulations against auto industry challenge). The auto industry plaintiffs appealed this decision to the U.S. Court of Appeals for the Second Circuit, where oral arguments were heard on March 19, 2009. The Bush Administration filed an *amicus* brief, in support of the auto industry, arguing the case was not ripe because EPA had yet to grant California the waiver. The Obama Administration has not withdrawn this brief, but it sent the court a letter stating it is reconsidering its position on preemption as it relates to fuel economy standards.

The U.S. District Court for the Eastern District of California followed *Green Mountain* in *Central Valley Chrysler-Jeep, Inc. v. Goldstene*, 529 F. Supp. 2d 1151 (E. D. Cal. 2007, corrected Mar. 26, 2008), *reconsidered*, 563 F. Supp. 2d 1158 (E. D. Cal. Jun 24, 2008). Plaintiff automakers appealed this decision to the U.S. Court of Appeals for the Ninth Circuit, where opening briefs were filed on February 9, 2009. California is seeking to have the case held in abeyance, or to have the briefing schedule delayed, while the Obama EPA reconsiders the state's request for a waiver. The Ninth Circuit has not yet ruled on California's request to have the case held in abeyance. As two these decisions are on appeal, the final outcomes are still undetermined.

There are also two other similar pending cases filed in Rhode Island and New Mexico. The federal district court in Rhode Island held the auto manufacturers' suit was precluded due to the decision in Vermont and California, but allowed the auto dealers to pursue their litigation. See *Lincoln-Dodge, Inc. v. Sullivan*, 588 F. Supp. 2d 224 (D.R.I. 2008). The manufacturers appealed to the U.S. Court of Appeals for the First Circuit. In March 2009, the district court stayed the dealers' litigation pending the outcome of the manufacturers' appeal. *Lincoln-Dodge, Inc. v. Sullivan*, No. 06-69, 06-70, 2009 WL 578541 (D.R.I. Mar 04, 2009).

Presumably seeking to avoid a similar finding of preclusion, autodealers (but not automakers) filed suit in federal court in New Mexico. *Zangara Dodge, Inc. v. Curry*, No. 07-01305 (D. N.M., filed Dec. 27, 2007). Due to an influx of motions and other filings, in March 2009, the court directed the parties to re-file their paperwork in a more orderly fashion, and banned any additional filings.

<sup>134</sup> Memorandum from Committee on Oversight and Government Reform, Majority Staff, to Members of the Committee on Oversight and Government Reform, EPA's Denial of the California Waiver (May 19, 2008), available at <http://oversight.house.gov/documents/20080519131253.pdf>.

<sup>135</sup> Letter from Stephen L. Johnson, Administrator, EPA to Arnold Schwarzenegger, Governor of California, (Dec. 19, 2007), available at <http://www.epa.gov/otaq/climate/20071219-slj.pdf>.

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<sup>136</sup> California State Motor Vehicle Pollution Control Standards; Notice of Decision Denying a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles, 73 Fed. Reg. 12,156, 12,157 (Mar. 6, 2008).

<sup>137</sup> *Id.* at 12,156.

<sup>138</sup> *Id.*

<sup>139</sup> See Letter from Johnson to Schwarzenegger, *supra* note 135.

<sup>140</sup> In March 2009, the D.C. Circuit stayed the case pending the outcome of the Obama administration's reconsideration of the matter, and ordered both sides to file motions to govern future proceedings in the case within 30 days of completion of the EPA's review process. *California v. EPA*, No. 08-1178 (D.C. Cir. March 3, 2008). California and fifteen other states had first sued EPA in the Ninth Circuit in January 2008, challenging the unofficial denial from Johnson's letter. *California v. EPA*, No. 08-70011 (9th Cir., filed Jan. 2, 2008), available at [http://ag.ca.gov/cms\\_attachments/press/pdfs/n1514\\_epapetition-1.pdf](http://ag.ca.gov/cms_attachments/press/pdfs/n1514_epapetition-1.pdf). The court dismissed that suit because the letter was not a final agency action and therefore not reviewable. *California v. EPA*, No. 08-70011, *review denied* (9th Cir. July 25, 2008).

<sup>141</sup> California State Motor Vehicle Pollution Control Standards; Greenhouse Gas Regulations; Reconsideration of Previous Denial of a Waiver of Preemption, 74 Fed. Reg. 7,040 (Feb. 12, 2009).

<sup>142</sup> *Id.* at 7,041.

<sup>143</sup> See Omnibus Appropriations Act of 2009, Pub. L. 111-8, Div. E, § 424 (signed into law on March 11, 2009). That section states: "Not later than June 30, 2009, the Administrator of the Environmental Protection Agency shall reconsider, and confirm or reverse, the decision to deny the request of the State of California to regulate greenhouse gas emissions from new motor vehicles."

<sup>144</sup> See, e.g., Memorandum from President Obama for Administration of EPA, State of California Request for Waiver Under 42 U.S.C. 7543(b), the Clean Air Act (Jan. 26, 2009), available at [http://www.whitehouse.gov/the\\_press\\_office/Presidential\\_Memorandum\\_EPA\\_Waiver/](http://www.whitehouse.gov/the_press_office/Presidential_Memorandum_EPA_Waiver/).

<sup>145</sup> *California v. Johnson*, Petition for Rule Making Seeking the Regulation of Greenhouse Gas Emissions from Ocean-Going Vessels (EPA Oct. 3, 2007), available at [http://ag.ca.gov/cms\\_pdfs/press/N1474\\_Petition.pdf](http://ag.ca.gov/cms_pdfs/press/N1474_Petition.pdf) [hereinafter California Marine Petition].

<sup>146</sup> Petition for Rulemaking under the Clean Air Act to Reduce the Emission of Air Pollutants from Marine Shipping Vessels that Contribute to Global Climate Change (EPA Oct. 3, 2007) (filed by Earthjustice, Center for Biological Diversity, Earth Justice, Friends of the Earth, and Oceana), available at [http://www.oceana.org/fileadmin/oceana/uploads/Climate\\_Change/Marine\\_GHG\\_Petition\\_FINAL.pdf](http://www.oceana.org/fileadmin/oceana/uploads/Climate_Change/Marine_GHG_Petition_FINAL.pdf) [hereinafter Earthjustic Marine Petition].

<sup>147</sup> California Marine Petition, *supra* note 145, at 9-12.

<sup>148</sup> *Id.* at 15-16.

<sup>149</sup> Earthjustice Marine Petition, *supra* note 146, at 40.

<sup>150</sup> *California v. Johnson*, Petition for Rulemaking Seeking the Regulation of Greenhouse Gas Emissions from Aircraft (EPA Dec. 4, 2007), available at [http://ag.ca.gov/globalwarming/pdf/aircraft\\_petition.pdf](http://ag.ca.gov/globalwarming/pdf/aircraft_petition.pdf) [hereinafter California Aircraft Petition]. The petition was joined by Connecticut, New Jersey, New Mexico, Pennsylvania, New York City, and the District of Columbia, as well as the California South Coast Air Quality Management District.

<sup>151</sup> Petition for Rulemaking Under the Clean Air Act to Reduce the Emission of Air Pollutants from Aircraft that Contribute to Global Climate Change Earthjustice (Dec. 5, 2007), available at [http://www.earthjustice.org/library/legal\\_docs/petition-to-epa-on-aircraft-global-warming-emissions.pdf](http://www.earthjustice.org/library/legal_docs/petition-to-epa-on-aircraft-global-warming-emissions.pdf) [hereinafter Earthjustice Aircraft Petition] (filed by Earthjustice, Friends of the Earth, Oceana, and the Center for Biological Diversity).

<sup>152</sup> California Aircraft Petition, *supra* note 150, at 14-16, 18-19. California's petition also suggests a cap-and-trade system for aircraft emissions but does not explain the legal authority under the CAA to enact such a system nor how such a system would practically function. *Id.* at 15.



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<sup>153</sup> Petition for Rulemaking Seeking the Regulation of Greenhouse Gas Emissions from Nonroad Vehicles and Engines (Jan. 29, 2008), *available at* [http://ag.ca.gov/cms\\_attachments/press/pdfs/n1522\\_finaldraftnonroadpetition3.pdf](http://ag.ca.gov/cms_attachments/press/pdfs/n1522_finaldraftnonroadpetition3.pdf) [hereinafter California NonRoad Petition]. The petition was joined by Connecticut, Massachusetts, New Jersey, Oregon, and Pennsylvania.

<sup>154</sup> *ICTA v. Johnson*, Petition for Rulemaking Seeking the Regulation of Greenhouse Gas Emissions from Nonroad Vehicles and Engines (Jan. 29, 2008), *available at* <http://www.westernlaw.org/files-1/Petition%20Nonroad%20Final%2020080129.pdf> [hereinafter ICTA NonRoad Petition] (filed by ICTA, Center for Good Safety, and Friends of the Earth).

<sup>155</sup> California Nonroad Petition, *supra* note 153, at 12-13, 15.

<sup>156</sup> Standards of Performance for Petroleum Refineries; Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction, or Modification Commenced After May 14, 2007, 73 Fed. Reg. 78521 (Dec. 22, 2008) (to be codified at 40 CFR Pt. 60), *available at* [http://www.epa.gov/ttn/oarpg/t3/fr\\_notices/nsps\\_petrefin\\_stayprovisions\\_121208.pdf](http://www.epa.gov/ttn/oarpg/t3/fr_notices/nsps_petrefin_stayprovisions_121208.pdf)

<sup>157</sup> See Office of Air & Radiation, EPA, Policy and Guidance—What’s New, <http://www.epa.gov/ttn/oarpg/new.html> (last visited Apr. 12, 2009) (showing that EPA’s last action on petroleum refinery performance standards was taken in December 2008). Under Section 111 of the CAA, EPA issues emissions standards for certain categories of new stationary sources, like petroleum refineries. EPA is statutorily required to revise such standards periodically. CAA § 111(b)(1)(B). New Source Performance Standards are discussed further *infra* Chapter 3.

<sup>158</sup> See EPA 2008 ANPR, 73 Fed. Reg., at 44,458-62.

<sup>159</sup> Letter from Edmund J. Brown, Jr., Attorney General, State of California to Stephen Johnson and Margo Orge, Director, Office of Transportation and Air Quality, (July 31, 2008), *available at* [http://ag.ca.gov/globalwarming/pdf/180\\_day\\_notice.pdf](http://ag.ca.gov/globalwarming/pdf/180_day_notice.pdf). The other local governments include Connecticut, New Jersey, Oregon, and Pennsylvania, and New York City. This intent to sue was filed pursuant to Section 304 of CAA and EPA regulations, 40 C.F.R. pt. 54, §§ 54.2(a), 54.3(a), which require that any person intending to file a legal action against EPA for unreasonable delay in acting must give 180 days’ notice.

<sup>160</sup> See Office of the Attorney General of California, Clean Air Act <http://www.ag.ca.gov/globalwarming/cleanairact.php> (last visited Apr. 21, 2009) (detailing California actions on climate change through March 2009, but listing no litigation on this issue).

<sup>161</sup> *New York v. EPA*, No. 06-1322 (D.C. Cir. Sept. 24, 2007).

<sup>162</sup> See Comments on Proposed Rule from Attorneys General of the States of California and Oregon, the Commonwealth of Massachusetts, and the Corporation Counsel for the City of New York, to EPA (June 25, 2008), *available at* [http://ag.ca.gov/globalwarming/pdf/steam\\_generating\\_units.pdf](http://ag.ca.gov/globalwarming/pdf/steam_generating_units.pdf) (comments on docket EPA-HQ-OAR-2005-0031).

<sup>163</sup> *In re Deseret Power Electric Cooperative*, PSD Appeal No. 07-03 (EAB Nov. 13, 2008). The Environmental Appeals Board of EPA is a permanent, impartial, four-member body that is a final decisionmaker on administrative appeals under all major environmental statutes EPA administers. See 40 C.F.R. § 1.25(2) (2008).

<sup>164</sup> *Deseret Power*, *supra* note 163; see also Memorandum from Stephen Johnson, EPA Administrator, to Regional EPA Administrators, EPA’s Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program (Dec. 12, 2008) (responding to remand).

<sup>165</sup> See Press Release, Kansas Department of Health and Environment, KDHE Denies Sunflower Electric Air Quality Permit (Oct. 18, 2007), *available at* [http://www.kdheks.gov/news/web\\_archives/2007/10182007a.htm](http://www.kdheks.gov/news/web_archives/2007/10182007a.htm).

<sup>166</sup> Senate Bill No. 265 (An act concerning energy; relating to conservation and electric generation, transmission and efficiency and air emissions). A similar bill failed to pass by veto-proof margin in the previous year, and the Governor vetoed.

<sup>167</sup> *Sunflower Electric Power Corporation v. Sebelius*, No. 08-2575 (D. Kan. 2008).

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<sup>168</sup> Complaint at 2, *Environmental Integrity Project v. EPA*, No. 1:09-cv-00218 (D.C. Cir. filed Feb. 4, 2009), available at [http://www.environmentalintegrity.org/pubs/FINAL\\_N20%20NSPS%20Filing\\_20090204%20pdf.pdf](http://www.environmentalintegrity.org/pubs/FINAL_N20%20NSPS%20Filing_20090204%20pdf.pdf).

<sup>169</sup> See Standards of Performance for Nitric Acid Plants, 40 C.F.R. § 60.72 (2008) (citing last revision in 1975). The rule was last reviewed (though not revised) in 1984. See Complaint, *supra* note 168, at 2. Section 111(b)(1)(B) of the CAA required review every eight years.

<sup>170</sup> See *Am. Farm Bureau Fed. v. EPA*, No. 06-1410, 2009 U.S. App. LEXIS 3562 (D.C. Cir. Feb. 24, 2009).

<sup>171</sup> See Unopposed Motion to Vacate the Briefing Schedule, *Mississippi v. EPA*, No. 08-1200 (D.C. Cir. filed Mar. 10, 2009).

<sup>172</sup> *Massachusetts v. EPA*, 549 U.S. at 529 (“Carbon dioxide, methane, nitrous oxide, and hydrofluorocarbons are without a doubt ‘physical [and] chemical . . . substance[s] which [are] emitted into . . . the ambient air.’”) (quoting CAA definition of air pollutant).

<sup>173</sup> *Id.* (“The statutory text forecloses EPA’s reading. The Clean Air Act’s sweeping definition of ‘air pollutant’ includes ‘any air pollution agent or combination of such agents, including any physical, chemical . . . substance or matter which is emitted into or otherwise enters the ambient air . . .’ On its face, the definition embraces all airborne compounds of whatever stripe, and underscores that intent through the repeated use of the word ‘any.’ . . . The statute is unambiguous.”).

<sup>174</sup> Proposed Endangerment Finding, *supra* note 112, at 100.

<sup>175</sup> *Id.* at 50-69, 101-104.

<sup>176</sup> See *id.* at 101-06.

<sup>177</sup> A single source could, and usually does, emit more than one GHG. If EPA were to classify the six GHGs separately as individual pollutants, the agency would likely have to issue regulations preventing the increase of emissions of any GHG pollutant. If a control technology significantly decreased a source’s methane emissions but simultaneously slightly increased that same source’s carbon dioxide emissions, there would be a net gain in the reduction of global warming pollution; but such a device might be off-limits, since EPA’s regulations would not permit a carbon dioxide increase, even if offset by a methane decrease. In contrast, by regulating all GHGs as a single pollutant, EPA’s regulations could encourage any tactic with an overall environmental gain, even if some individual gas emissions increased slightly.

<sup>178</sup> Proposed Endangerment Finding, *supra* note 112, at 69-100.

<sup>179</sup> 549 U.S. at 533-34.

<sup>180</sup> *Id.* at 534.

<sup>181</sup> *Id.*

<sup>182</sup> *Id.* at 521 (citation omitted); see also *id.* at 523 (“EPA does not dispute the existence of a causal connection between man-made greenhouse gas emissions and global warming.”).

<sup>183</sup> In particular, the language: emphasizes the preventive or precautionary nature of the CAA; authorizes the Administrator to reasonably project into the future and weigh risks; assures the consideration of the cumulative impact of all sources; instructs that the health of susceptible individuals, as well as healthy adults, should be part of the analysis; and indicates an awareness of the uncertainties and limitations in information available to the Administrator. H.R. REP. 95- 294, at 49-50 (1977); see also Proposed Endangerment Finding, *supra* note 112, at 25-27, 33.

<sup>184</sup> H.R. REP. 95-294, at 51.

<sup>185</sup> Proposal Endangerment Finding, *supra* note 112, at 29 (emphasis added).

<sup>186</sup> CAA § 302(h) (emphasis added).

<sup>187</sup> 549 U.S. at 521-26; see also discussion in Introduction.

<sup>188</sup> See IPCC 2007 Report, *supra* note 2, at 30-33, 48-54; see also Proposed Endangerment Finding, *supra* note 112, at 71-81; 87-93.

<sup>189</sup> *Whitman v. American Trucking Ass’ns*, 531 U.S. 457, 466 (2001) (construing terms as used in section 109 when setting National Ambient Air Quality Standards).

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<sup>190</sup> See, e.g., National Ambient Air Quality Standard for Ozone; Final Rules, 73 Fed. Reg. 16,436, 16,440-43 (March 27, 2008) (codified at 40 C.F.R. pts. 50 and 58).

<sup>191</sup> Congress never defines “public health” in the Clean Air Act. In fact, Congress thought the term was fairly self-explanatory. See S. REP. NO. 91-1196, at 34 (1970 (“Since the nature of the general welfare is less well-defined than the public health . . .”). Some statutory evidence and legislative history does support the idea that Congress intended “public health” to mean only health effects from direct exposure to pollutants:

- H.R. REP. NO. 95-294, at 49-50 (1977) (“By use of the words ‘cause or contribute to air pollution,’ the committee intends to require the Administrator to consider all sources of the contaminant which contributes to air pollution and to *consider all sources of exposure* to the contaminant—food, water, air, etc.—*in determining health risks.*”)
- S. REP. NO. 91-1196, at 7 (1970) (“Knowledge of the relationship between the *exposure* to many air pollution agents and acute and chronic health effects is sufficient to develop air quality criteria related to such effects.”); *id.* (“The protection of the public health and welfare requires definitive knowledge of the causal relationship between exposure to air pollution agents—single or in combination—and health or welfare under varying environmental conditions.”); *id.* at 10 (“Ambient air quality is sufficient to protect the health of such persons whenever there is an absence of adverse effect on the health of a statistically related sample of persons in sensitive groups from exposure to the ambient air.”).
- CAA § 103(d) (creating a research program to explore the “short and long-term effects of air pollutants on human health” resulting from “both routine and accidental exposures.”).
- CAA § 160(1) (describing the purpose of the Prevention of Significant Deterioration program as “to protect public health and welfare from any actual or potential adverse effect . . . anticipate[d] to occur from air pollution or from *exposure* to pollutants in other media, which pollutants originate as emissions to the ambient air.”).
- CAA § 711(a)(1) (describing that specifically for carbon dioxide emissions, Congress felt the main impacts would be “economic, physical, climatic, and social”—i.e., not health).

Health effects not related to exposure (where exposure includes ambient concentrations, deposition, and bioaccumulation) are, therefore, not necessarily part of the standard definition of “public health.” While the statutory definition of “public welfare” does not explicitly include environmental public health effects, the term is deliberately broad. See CAA § 302(h). In the past, EPA has listed indirect health effects as welfare effects. For example, EPA listed ozone’s effects on UVB-induced human diseases and climate change as welfare effects, even while acknowledging significant health effects. See NAT’L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR OZONE, *supra* note 9. Similarly, risk to human health from toxins released by algal blooms caused by sulfur oxides was part of the ecological criteria document for that pollutant. See NAT’L CTR. FOR ENVTL. ASSESSMENT, EPA, NO. 600/R-08/082F, INTEGRATED SCIENCE ASSESSMENT FOR OXIDES OF NITROGEN AND SULFUR—ECOLOGICAL CRITERIA (2008).

<sup>192</sup> Proposed Endangerment Finding, *supra* note 112, at 82.

<sup>193</sup> See IPCC 2007 Report, *supra* note 2, at 48-53 (noting how the vectors for various diseases will be able to expand their habitat as the planet warms); see also Proposed Endangerment Finding, *supra* note 112, at 81-87.

<sup>194</sup> *Id.* at 86-87 (“Some have argued that a positive endangerment finding for public health cannot be made because the health effects associated with elevated atmospheric concentrations of greenhouse gases occur via climate change, and not directly through inhalation or other exposure to the greenhouse gases themselves. These commenters argue that because “climate” is included in the definition of welfare, the Act requires that all effects which may flow from a welfare effect must themselves be considered a welfare effect. The Administrator disagrees with this narrow view of the endangerment criteria. Mortality and morbidity that result from the effects of climate change are clearly public health problems.”).

<sup>195</sup> *Id.* at 69-100.

<sup>196</sup> In the CAA 1977 Amendments, section 202 (a)(1) was amended by striking out “which cause or contribute to, or are likely to cause or contribute to, air pollution which endangers” and substituting “which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger.” This

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change was made to standardize the contribution language thought the various sections of the Act. When making this change, Congress reiterated that the contribution standard would remain a precautionary standard. *See, e.g.*, H.R. REP. NO. 95-294, at 49-50 (1970).

<sup>197</sup> *Id.* at 50; *see* Proposed Endangerment Finding, *supra* note 112, at 29, 33.

<sup>198</sup> 370 F.3d 1, 13-15 (D.C. Cir. 2004) (analyzing what constitutes “contribution” versus “significant contribution” in the context of section 231).

<sup>199</sup> *Id.* at 13 (citing WEBSTER’S NEW INT’L DICTIONARY 496 (3d ed. 1993); OXFORD ENGLISH DICTIONARY 849 (2d ed. 1989)).

<sup>200</sup> *Id.*

<sup>201</sup> Proposed Endangerment Finding, *supra* note 112, at 37.

<sup>202</sup> *Id.* at 110.

<sup>203</sup> *Id.* at 39.

<sup>204</sup> *See, e.g.*, Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements; Final Rule, 66 Fed. Reg. 5001, 5006-07 (codified at 40 C.F.R. pts. 69, 80, and 86) (Jan. 18, 2001) (estimating that heavy-duty trucks and buses account for 28% of nitrogen oxides emissions and 20% of particulate matter emissions from mobile sources, and concluding this is a contribution to the air pollution).

<sup>205</sup> *See, e.g.*, Control of Emissions From Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine and Land-Based); Final Rule, 67 Fed. Reg. 68,242, 68,245 (Nov. 8, 2002) (to be codified at 40 C.F.R. pts. 89, 90, 91, 94, 1048, 1051, 1065, 1068) (“Within national parks, emissions from snowmobiles in particular contribute to ambient concentrations of fine PM, a leading cause of visibility impairment.”).

<sup>206</sup> *See, e.g., id.* (“Nationwide, [spark-ignition] engines and vehicles are a significant source of mobile source air pollution. As described below, of all mobile source emissions in 2000 they accounted for about 9 percent of HC emissions, 4 percent of CO emissions, 3 percent of NO<sub>x</sub> emissions, and 2 percent of direct PM emissions. The emissions from Large SI engines contributed 2 to 3 percent of the HC, NO<sub>x</sub>, and CO emissions from mobile sources in 2000. Recreational vehicles by themselves account for about 6 percent of national mobile source HC emissions and about 2 percent of national mobile source CO emissions.”); *id.* at 68,248 (finding snowmobiles “contributed” the pollution in a nonattainment area by contributing 1.2% of the total daily CO inventory in that area for 2001).

<sup>207</sup> Proposed Endangerment Finding, *supra* note 112, at 14 (noting that the electricity generating sector is the largest contributor. The language of Section 202 only allows EPA to address pollution from mobile sources (except aircraft engines) by regulating new models. With respect to the contribution of “new” motor vehicles (as opposed to existing ones), the only way to prevent motor vehicle pollution is to mandate that all new motor vehicles meet certain standards, assuming that at a certain point all older models will be off the road. Even if in any one year, there is a limited number of new motor vehicles, cumulatively all the new vehicles that will be on the road in the next few years will contribute to the air pollution. .

<sup>208</sup> *Id.* at 118.

<sup>209</sup> Thus, these percentages should be converted into carbon dioxide-equivalent units, since the “pollution” is defined as the elevated cumulative concentrations of all six main GHGs together. *See supra* note 12.

<sup>210</sup> 549 U.S. at 524-25.

<sup>211</sup> Section 202(a)(3) of the CAA provides additional considerations when EPA revises emissions standards for heavy-duty trucks (vehicles with gross weight above 8,500 lbs) and their engines. EPA may revise such regulations as it receives information on the effects of emissions from these engines and vehicles on public health and welfare.

<sup>212</sup> California Aircraft Petition, *supra* note 180; *see* discussion in Chapter 1, section C.2

<sup>213</sup> Under 231(a)(1), Congress ordered EPA to undertake a study of air pollutants from aircraft “to determine (A) the extent to which such emissions affect air quality in air quality control regions throughout the United States, and (B) the technological feasibility of controlling such emissions.”

<sup>214</sup> CAA § 231(b)

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<sup>215</sup> *Id.* § 233.

<sup>216</sup> See, e.g., EPA, Control of Air Pollution From Aircraft and Aircraft Engines; Emission Standards and Test Procedures; Direct final rule, 62 Fed. Reg. 25,356 (May 8, 1997) (codified at 40 C.F.R. pt. 87) (“All of the affected engines are already meeting the ICAO CO and first-stage NO<sub>x</sub> emission standards that EPA is adopting today. Most engines also meet the ICAO second-stage NO<sub>x</sub> standard; only a few models need minor reductions in emissions to meet this standard.”); EPA, Control of Air Pollution From Aircraft and Aircraft Engines; Emission Standards and Test Procedures; Final rule, 70 Fed. Reg. 69,664, 69,666 (Nov. 17, 2005) (codified at 40 C.F.R. pt. 87) (adopting standards equivalent to the nitrogen oxide standards of the International Civil Aviation Organization and discussing history of EPA’s regulation of aircraft engine emissions). See also *id.* at 69,676 (noting EPA has greater flexibility under section 231 in determining what standard is most reasonable for aircraft engines, and is not required to achieve a “technology-forcing” result” but noting that “EPA does not agree that a technology-forcing standard would be precluded by section 231”).

<sup>217</sup> CAA § 231(a)(2)(B)(i); *id.* § 232(a) (delegating enforcement authority to aircraft emissions standards to Department of Transportation (DOT)); 49 C.F.R. § 1.47(g) (assigning to FAA authority delegated by CAA to DOT over aircraft standards).

<sup>218</sup> Notably, the “cause or contribute” language in Section 202 and 213 are slightly different. Section 202 uses the term “cause or contribute” whereas Section 213 uses the phrase “causes or contributes.” In Section 202, “cause or contribute” appears to refer to the plural “classes” or “motor vehicles;” whereas Section 213’s “causes or contributes” appears to refer to the “emission” from classes or aircraft engines. Under either reading, the result is the same: the endangerment findings are source specific (because the emission from the specific source must contribute to the air pollution).

<sup>219</sup> EPA has exercised authority to regulate in-use aircraft engines. For example, the first aircraft emissions controls EPA adopted included retrofit standards for in-use aircraft engines. EPA, Emission Standards and Test Procedures for Aircraft; Final rule, 38 Fed. Reg. 19088 (July 17, 1973) (codified at 40 C.F.R. pt. 87). EPA’s aircraft emissions standards, however, usually only apply to new aircraft engines and in some cases only to newly-certified engines. See, e.g., 70 Fed. Reg. 69,664.

<sup>220</sup> See Appendix for further discussion of these principles.

<sup>221</sup> OFFICE OF ENVIRONMENT AND ENERGY, FAA, AVIATION AND EMISSION: A PRIMER 1 (Jan. 2005), available at [http://www.faa.gov/regulations\\_policies/policy\\_guidance/envir\\_policy/media/aeprimer.pdf](http://www.faa.gov/regulations_policies/policy_guidance/envir_policy/media/aeprimer.pdf). [hereinafter FAA Emissions Report]. A little less than 30 % are water vapor, and 1 % each of NO<sub>x</sub>, CO, SO<sub>x</sub>, VOC, particulates, and other trace components.

The petition also request the regulation of water vapor trails from airplanes (“contrails”) and nitrogen oxide emissions. Neither is considered one of the six traditional GHGs but have climate warming effects. Water vapor contrails add to cloud cover and contribute to global warming; it is excluded from the EPA’s proposed endangerment finding. Proposed Endangerment Finding, *supra* note 112, at 61. Nitrogen oxide contributes to the formation of ozone. EPA GHG Inventory, *supra* note 12, at 1-3-1-5. EPA must respond to these requests and make a decision as whether water vapor and nitrogen oxide are air pollutants, whether they endanger public health, and whether aircraft engines contribute to that air pollution. It would be difficult for EPA to avoid making such findings.

<sup>222</sup> FAA Emissions Report, *supra* note 221, at 10; EPA GHG Inventory, *supra* note 12, at ES-2, 3-13.

<sup>223</sup> FAA Emissions Report, *supra* note 221, at 5. In recent years, GHG emissions from aviation declined due to the fall off in air travel following the terrorist acts of 9/11, the war in Iraq, and the worldwide recession. As air travel recovers in the coming years, GHG emissions from aircraft are expected to resume their climb. *Id.* at 10.

<sup>224</sup> FAA Emissions Report at 10.

<sup>225</sup> 549 U.S. 524-25.

<sup>226</sup> California Marine Petition, *supra* note 145; see discussion in Chapter 1, section C.2.

<sup>227</sup> The CAA defines “nonroad engine” as: “an internal combustion engine (including the fuel system) that is not used in a motor vehicle or a vehicle used solely for competition, or that is not subject to standards promulgated under section 111 or section 202.” The Act defines “nonroad vehicle” as: “a vehicle that is

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powered by a nonroad engine and that is not a motor vehicle or a vehicle used solely for competition.” CAA §§ 216(10),(11).

<sup>228</sup> The CAA delegates to the EPA Administrator the authority to define the term “volatile organic compound” or “VOC”. *Id.* § 302(s). The Administrator has defined the term as “[a]ny organic compound that participates in atmospheric photochemical reactions except those designated by EPA as having negligible photochemical reactivity.” EPA, TERMS OF ENVIRONMENT, GLOSSARY, ABBREVIATIONS, AND ACRONYMS (1997), available at <http://www.epa.gov/OCEPaterms>.

<sup>229</sup> Those sections mandate that if EPA finds that emissions from non-road sources are significant contributors to ozone or carbon monoxide pollution in more than one area that has failed to attain the national ambient air quality standards for those pollutants, EPA must promulgate standards for those individual classes or categories of new nonroad engines whose emissions “cause or contribute” to carbon monoxide or ozone concentrations in the non-attainment areas. In setting these standards, EPA is directed to “first consider standards equivalent in stringency to standards for comparable motor vehicles and engines (if any)” under Section 202. CAA §§ 213(a)(2), (3).

<sup>230</sup> *Id.* §§ 213(a)(4).

<sup>231</sup> *Id.* §§ 213(b).

<sup>232</sup> As with Section 202, states are preempted from setting emissions standards for new nonroad vehicles. CAA § 209(e)(1); *see also Engine Mfrs. Ass’n v. EPA*, 88 F.3d 1075, 1087-93 (D.C. Cir. 1996) (holding that the CAA also preempts states from regulating existing nonroad vehicles); *Pacific Merchant Shipping Ass’n v. Goldstene*, 517 F.3d 1108, 1113 (9<sup>th</sup> Cir. 2008) (same). But California may seek a waiver from EPA to adopt its own standards (except for new construction and farm equipment smaller than 175 horsepower and new locomotives or locomotive engines, for which state regulation is completely preempted). CAA, § 209(e)(1), (2)(A). Other states may adopt and enforce California’s standards that are granted a waiver as long as the state adopts the standard at least two years before the commencement of the model year. *Id.* §209(e)(2)(B).

<sup>233</sup> EPA, Control of Emissions From New Marine Compression-Ignition Engines at or Above 30 Liters Per Cylinder; Final rule, 68 Fed. Reg. 9,746 (Feb. 28, 2003) (codified at 40 C.F.R. pts. 9, 94).

<sup>234</sup> EPA, Control of Emissions From Nonroad Large Spark-Ignition Engines, and Recreational Engines (Marine and Land-Based); Final rule, 67 Fed. Reg. 68,242, 68,245 (Nov. 8, 2002) (to be codified at 40 C.F.R. pts. 89, 90, 91, 94, 1048, 1051, 1065, 1068).

<sup>235</sup> Notably, section 213(a)(4) does not specifically mention the term “air pollutant,” but rather only refers to regulation of “emissions.” However, the term “standard applicable to emissions” is probably synonymous with the term “emissions standard.” *See* discussion at note X. Section 302(k) defines an “emission standard” (or an “emissions limitation”) as “a requirement established by the State or the Administrator which limits the quantity, rate, or concentration of emissions of *air pollutants* on a continuous basis, including any requirement relating to the operation or maintenance of a source to assure continuous emission reduction, and any design, equipment, work practice or operational standard promulgated under this Act.” (emphasis added). Therefore, the requirement that a substance be an air pollutant will probably be read into Section 213(a). Because of Supreme Court’s definition of air pollutant is so broad, there is really no practical difference whether these substances are treated as “emissions” or as “air pollutants.”

<sup>236</sup> *See Bluewater Network v. EPA*, 370 F.3d 1, 13-14 (D.C. Cir 2004). *Bluewater* construes subsection (a)(3), but presumably the same logic applies to subsection (a)(4) since the statutory language is identical. The court explained, “[t]he repeated use of the term ‘significant’ to modify the contribution required for all nonroad vehicles, coupled with the omission of this modifier from the ‘cause, or contribute to’ finding required for individual categories of new nonroad vehicles, indicates that Congress did not intend to require a finding of ‘significant contribution’ for individual vehicle categories.” *Id.* at 13.

<sup>237</sup> *Id.*; *see also* EPA, Control of Air Pollution; Determination of Significance for Nonroad Sources and Emission Standards for New Nonroad Compression- Ignition Engines At or Above 37 Kilowatts; Final rule, 59 Fed. Reg. 31,306, 31,309 (June 17, 1994) (codified at 40 C.F.R. pt. 9, 89).

<sup>238</sup> EPA, Control of Air Pollution; Emissions of Oxides of Nitrogen and Smoke From New Nonroad Compression-Ignition Engines at or Above 50 Horsepower; Notice of proposed rulemaking, 58 Fed. Reg. 28,809, at 28.811 (May 17, 1993) (to be codified at 40 C.F.R. pt. 89).

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<sup>239</sup> *Id.*, citing SEN. REP. NO. 101-228, at 104 (1989).

<sup>240</sup> *See, e.g.*, 67 Fed. Reg. at 68,245 (“Nationwide, [spark-ignition] engines and vehicles are a significant source of mobile source air pollution. As described below, of all mobile source emissions in 2000 they accounted for about 9 percent of HC emissions, 4 percent of CO emissions, 3 percent of NO<sub>x</sub> emissions, and 2 percent of direct PM emissions. The emissions from Large SI engines contributed 2 to 3 percent of the HC, NO<sub>x</sub>, and CO emissions from mobile sources in 2000. Recreational vehicles by themselves account for about 6 percent of national mobile source HC emissions and about 2 percent of national mobile source CO emissions.”); *id.* at 68,248 (finding snowmobiles “contributed” the pollution in a nonattainment area by contributing 1.2% of the total daily CO inventory in that area for 2001).

<sup>241</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,462, citing EPA GHG Inventory, *supra* note 12. These numbers are on a carbon dioxide equivalence basis.

<sup>242</sup> *Id.* at 44,435, 44,462 (noting that marine vessels constitute 8%, rail 3%, and other nonroad sources 8% of U.S. transportation emissions). Diesel engines are the largest contributor of carbon dioxide at 71%, and gasoline, LPG, and natural gas-fueled engines account for the remaining 29%. Carbon dioxide emissions from individual nonroad categories are (in decreasing prominence): nonroad diesel (farm tractors, construction and mining equipment); diesel locomotives; small spark-ignition engines (such as lawnmowers, string trimmers, and portable power generators); large spark-ignition engines (such as forklifts and construction machines); recreational marine spark-ignition engines; and recreational off-road spark-ignition engines (such as all terrain vehicles and snowmobiles). *Id.* at 44,462.

<sup>243</sup> *See, e.g.*, California Marine Petition, *supra* at note 145.

<sup>244</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,466, citing EPA GHG Inventory, *supra* note 12. These numbers are on a carbon dioxide equivalence basis. The Earthjustice Petition also requests that EPA regulate black carbon, i.e. soot (a form of particulate matter), from marine vessels. Earthjustice Marine Petition, *supra* note 146, at 40-41. Although not classified as one of the traditional six GHGs, and excluded from EPA’s draft endangerment finding, black carbon is estimated to be the second largest contributor to global warming after carbon dioxide. Proposed Endangerment Finding, *supra* note 112, at 66-68. See discussion in Chapter 3, section A for more information on the warming effects of black carbon. EPA has indicated it will respond to the petitions for regulating of black carbon from mobile sources—mainly aircraft and marine vessels—in another rulemaking. *Id.* The existence of these petitions will require EPA to analyze the endangerment and contribution analysis for black carbon emissions from those sources. That analysis will probably result in a similar conclusion as for GHGs emissions from those sources.

The Earthjustice Petition also requests that EPA regulate nitrogen oxide (NO<sub>x</sub>) emissions from marine vessels. NO<sub>x</sub> is not a greenhouse gas per se, but interacts with other gases to create the greenhouse gas ozone. EPA GHG Inventory, *supra* note 12, at 1-3-1-5. However, because NO<sub>x</sub> is specifically mentioned in Section 213(a)(2), EPA must regulate it under that section. *Bluewater*, 370 F.3d at 13-14. That section gives EPA no discretion—it must regulate once it makes a findings that NO<sub>x</sub> is a “significant contributor” to ozone in more than one NAAQ nonattainment area. Once this finding is made, EPA must promulgate standards for those individuals classes or categories of new nonroad engines with emissions that “cause, or contribute to” ozone concentrations. In order to properly respond to this petition, EPA will need to assess whether nitrogen oxide from marine vessels meets the requirements under that section, which mandate regulation.

<sup>245</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,435, 44, 466; *see also* Sean Poltrack, *The Maritime Industry and Our Environment: The Delicate Balance of Economic and Environmental Concerns, Globally, Nationally, and Within the Port of Baltimore* 8 U. Balt. J. Env’tl. L. 51, 64 (2000). Notably, particulate matter and other emissions from marine vessels have a cooling effect on the atmosphere. *See* Daniel A. Lack, et al., PARTICULATE EMISSIONS FROM COMMERCIAL SHIPPING: CHEMICAL, PHYSICAL, AND OPTICAL PROPERTIES, J. GEOPHYSICAL RES. 114 (National Oceanic and Atmosphere Administration 2009). This should, however, not affect an endangerment finding for GHG emissions from marine vessels because that finding is air pollutant specific.

<sup>246</sup> International Council on Clean Transportation, *Air Pollution and Greenhouse Gas Emissions from Ocean-Going Ships* at 7 (Mar. 2007), available at [http://www.theicct.org/documents/48\\_06\\_ICCT\\_OceanReportComplete\\_04-4\\_taiwanRev.pdf](http://www.theicct.org/documents/48_06_ICCT_OceanReportComplete_04-4_taiwanRev.pdf).

<sup>247</sup> *See* Appendix for a discussion of the constraints on EPA action.

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<sup>248</sup> California Nonroad Petition, *supra* note 153; ICTA Nonroad Petition, *supra* note 154; *see also* Chapter 3, section C.2.

<sup>249</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,435.

<sup>250</sup> EPA GHG Inventory, Annex, at A-109.

<sup>251</sup> *Id.*

<sup>252</sup> CAA § 213(a)(5).

<sup>253</sup> *Id.* § 213(d). States are completely preempted from regulating standards covering emissions from new locomotives or locomotive engines. *Id.* §209(e)(1).

<sup>254</sup> *See, e.g.*, EPA, Control of Emissions of Air Pollution from Locomotives and Marine Compression-Ignition Engines Less Than 30 Liters per Cylinder; Republication; Final Rule, 73 Fed. Reg. 37,096 (June 30, 2008) (settings standards for nitrogen oxides and particulate matter); EPA, Emissions Standards for Locomotives and Locomotive Engines; Final Rulemaking, 63 Fed. Reg. 18978 (Apr. 16, 1998).

<sup>255</sup> *See* Appendix A for a discussion of EPA's discretion.

<sup>256</sup> That section also authorizes the Administrator to prohibit the sale of fuels and fuel additives not registered. Before registering a fuel additive under section 211(b), the Administrator may require the manufacturer "to conduct tests to determine potential public health effects of such fuel or additive" and to furnish information regarding the fuel additive's effect on "the emission control performance of any vehicle ... or the extent to which such emissions affect the public health or welfare." *Id.* § 211(b)(2)(A), (B).

Section 211(f)(1) prohibits the introduction into commerce of new fuel or additives. However, the Administrator may grant a waiver if the manufacturer demonstrates that the fuel additive will not cause or contribute to a failure of any emission system which ensures compliance with the emission standards. *See id.* § 211(f)(4); *see also Ethyl Corp. v. E.P.A.*, 51 F.3d 1053, 1055-60 (D.C. 1995) (holding plain language directs Administrator to consider only emission effects of fuel additive in evaluating application for waiver and Administrator cannot deny waiver on basis of public health concerns).

<sup>257</sup> This section also allows EPA to regulate any fuel if it would "impair to a significant degree the performance of any emission control device or system which is in general use." However, before regulating, the Administrator must also find that prohibition of a particular fuel or additive "will not cause the use of any other fuel or fuel additive which will produce emissions which will endanger the public health or welfare to the same or greater degree than the use of the fuel or fuel additive proposed to be prohibited." CAA § 211(c)(2)(C).

<sup>258</sup> CAA § 211(c) (2)(A).

<sup>259</sup> 211(c) (4) . Additionally, any state may regulate fuel as part of its State Implementation Plan pursuant to Section 110 if so approved by the Administrator.

In April 2009, California issued a Low Carbon Fuel Standard aimed at achieving a 10% reduction in GHG emissions from California's transportation fuels by 2020. Press Release, California Air Resources Board, California Adopts Low Carbon Fuel Standard (April 23, 2009) available at <http://www.arb.ca.gov/newsrel/nr042309b.htm>. California is prohibited under Section 211 from enforcing this standard until its application for a waiver under Section 209 for motor vehicle emissions standards is granted by EPA. As explained in Chapter 1, EPA is expected to grant this waiver by June 2009, at which point California will be able to implement its fuel standard.

<sup>260</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,476.

<sup>261</sup> Section 211(o) requires refiners and other obligated parties to ensure that a certain proportion of renewable fuels are used in the transportation sector. The EISA modified this section, and set a total renewable fuel standard of 36 billion gallons annually by 2022. For 2009, EPA set a renewable fuel standard at 10.21% of the volume of sale of refiners, importers and blenders (other than oxygen blenders). EPA, Renewable Fuel Standard for 2009, Issued Pursuant to Section 211(o) of the Clean Air Act; Notice, 73 Fed. Reg. 70,643 (Nov. 21, 2008).

<sup>262</sup> 73 Fed. Reg. at 44,362.

<sup>263</sup> California Marine Petition, *supra* note 145, at 39-40.



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<sup>264</sup> Both fuel oil and gasoline are derived from petroleum, i.e. crude oil. Fuel oils include distillate fuel oils, diesel fuel oils, light fuel oils, gasoil, residual fuel oils and heavy fuel oils. “Residual fuel” is what remains of the crude oil after gasoline and the distillate fuel oils are extracted through distillation, and is fairly inexpensive.

<sup>265</sup> CAA § 302(z) (“The term ‘stationary source’ means generally any source of an air pollutant except those emissions resulting directly from an internal combustion engine for transportation purposes or from a nonroad engine or nonroad vehicle as defined in section 216.”).

<sup>266</sup> See CAA § 111(a)(3) (“The term ‘stationary source’ means any building, structure, facility, or installation which emits or may emit any air pollutant.”).

<sup>267</sup> See S. REP. NO. 101-228, at 127-28 (1989) (distinguishing between criteria pollutants and hazardous pollutants).

<sup>268</sup> *E.g.*, CAA § 129 (regulating solid waste combustion units); CAA tit. IV (regulating pollutants that cause acid rain).

<sup>269</sup> CAA § 108(a)(1) (“For the purposes of establishing national primary and secondary ambient air quality standards, the Administrator shall . . . [list] each air pollutant—(A) emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; [and] (B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources.”).

<sup>270</sup> CAA § 108(a)(2).

<sup>271</sup> CAA § 109(b).

<sup>272</sup> CAA § 107(a) (“Each state shall have the primary responsibility for assuring air quality within the entire geographic area comprising such State.”); see CAA § 110 (instructing states to develop implementation plans to achieve and maintain NAAQS). Notably, NAAQS are pollutant-specific as opposed to source-specific, and states can regulate any source they deem appropriate, including both stationary and mobile sources (consistent with the limitations on state action under Title II). See, *e.g.*, CAA § 211(c)(4)(C) (“A State may prescribe and enforce, for purposes of motor vehicle emission control, a control or prohibition respecting the use of fuel . . . if an applicable implementation plan for such State under section 110 so provides.”). If an area within a state fails to meet a NAAQS, the state must impose stricter controls to bring this “non-attainment area” into attainment within a specific timeframe. “Attainment areas” must prevent significant deterioration of air quality. See *infra* Chapter 3(B) for more detail on prevention of significant deterioration and non-attainment area requirements.

<sup>273</sup> See National Primary and Secondary Ambient Air Quality Standards, 40 C.F.R. pt. 50 (2008).

<sup>274</sup> See NAT’L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS, *supra* note 9, at E-1, E-32 (noting regulation of tropospheric ozone under the CAA and the role of ozone as “a potent GHG”); NAT’L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, *supra* note 9, at 1-1, 4-209, 4-211 (noting regulation of particulate matter, including black carbon, under the CAA and the role of particulate matter in global warming).

<sup>275</sup> See *Natural Resources Defense Council v. Train*, 545 F.2d 320, 322-23 (2d Cir. 1976) (“Once a pollutant has been listed under § 108(a)(1), §§ 109 and 110 of the Act are automatically invoked.”).

<sup>276</sup> See *supra* Chapter 2, section B.

<sup>277</sup> *Massachusetts v. EPA*, 549 U.S. at 528-29 (defining “air pollutant” under Section 302(g)).

<sup>278</sup> See *supra* Chapter 2, section A.

<sup>279</sup> See *supra* Chapters 1, sections B; Chapter 2, section A.

<sup>280</sup> 549 U.S. at 529, n.26.

<sup>281</sup> See EPA, No. HQ-OAR-2008-0318-0083, TECHNICAL SUPPORT DOCUMENT: SECTION 202 GREENHOUSE GAS EMISSIONS 3 (2008) (showing that Section 202 sources are responsible for 24% of total U.S. greenhouse gas emissions).

<sup>282</sup> Most environmentalists and EPA analysts contend that the phrase does grant discretion, presumably because they are aware of the difficulties of applying NAAQS to greenhouse gases, see *infra* Chapter 5(C), and

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want to avoid such outcomes. See, e.g., *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. on Env't & Pub. Works*, 110th Cong. (2008) (statement of David Bookbinder, Sierra Club) (discussing how the phrase “plans to issue” grants EPA discretion); Nichols Testimony, *supra* note 54 (determining that NAAQS are not mandatory and that EPA has discretion on timing); *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. On Environment and Public Works*, 110th Cong. (2008) (statement of Jason Burnett, EPA) (noting how few individuals or groups support using NAAQS for GHGs, besides those attempting to forestall regulation of GHGs). Most industry analysts argue EPA has no discretion on listing, presumably because they want to demonstrate the horrible consequences of using the Clean Air Act to regulate greenhouse gases. See, e.g., *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. On Environment and Public Works*, 110th Cong. (2008) (statement of William Kovacs, U.S. Chamber of Commerce) (testifying that NAAQS are mandatory). Independent academic analysts are split. See, e.g., Jonathan A. Adler, *Massachusetts v. EPA Heats Up Climate Policy No Less Than Administrative Law*, 102 N.W. U. L. REV. 32, 39 (2007) (finding that NAAQS will be mandatory unless *Train* was wrongly decided).

<sup>283</sup> 545 F.2d 320 (2d Cir. 1976).

<sup>284</sup> See *id.* at 324.

<sup>285</sup> The substantial amendments in 1977 and 1990 included changes to the language of Section 108(a)(1)(A). Compare CAA of 1970 § 108 with CAA of 1977 § 108. In the 1970 version of the Clean Air Act, subsection A read “which in his judgment has an adverse effect on public health or welfare.” CAA of 1970 § 108. In 1977, after *Train* was decided, the subsection was changed to “emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.” CAA of 1977 § 108. The distinction is discussed *infra* note 303 and accompanying text.

<sup>286</sup> See *Chevron v. Natural Resources Defense Council*, 467 U.S. 837 (1984) (formalizing, though certainly not inventing, the deferential judicial review of an agency’s statutory interpretation).

<sup>287</sup> No subsequent case law has directly interpreted the meaning of the phrase, though courts have used the language interpreted in *Train* to support readings of other similar statutory provisions. For example, before the 1990 Amendments to the Act, Section 112(b)(1)(A) said that EPA “shall . . . publish . . . a list” of hazardous air pollutants “for which [EPA] intends to establish an emission standard under this section.” In *NRDC v. Thomas*, 689 F. Supp. 246 (S.D.N.Y. 1988), the court cited *Train* to conclude that Section 112 imposed a “mandatory, non-discretionary duty.”

When the Second Circuit ruled in *Train*, the court cited dicta in opinions from other circuits as support for its interpretation. *Train*, 545 F.2d at 324, n.6 (citing *Indiana & Michigan Electric Co. v. EPA*, 509 F.2d 839, 841 (7th Cir. 1975) and *Kennecott Copper Corp. v. EPA*, 149 U.S. App. D.C. 231, 462 F.2d 846, 857 (1972)). However, a Third Circuit case (cited in passing by the Second Circuit in *Train*, 545 F.2d at 324, n.6) came to the opposite conclusion. In *St. Joe Minerals Corp. v. EPA*, 508 F.2d 743, 744 n. 3 (3d Cir. 1975), *vacated as moot*, 425 U.S. 987 (1976), the court interpreted Section 108(a)(1) as requiring EPA to list all pollutants which “in the Administrator’s opinion, (1) detracted from the public health or welfare; (2) originated from numerous sources; and (3) merited controls” (emphasis added).

<sup>288</sup> *Train*, 545 F.2d at 325. See also *NRDC v. Thomas*, 689 F. Supp. at 253 (following *Train* to interpret the phrase “for which he intends to establish an emission standard under” Section 112).

<sup>289</sup> *NRDC v. Train*, 411 F. Supp. 864 (S.D.N.Y. 1976) (citing S. REP. NO. 91-1196, at 54 (1970)) (emphasis added).

<sup>290</sup> The courts’ interpretation seems unusual, since it might contradict the plain language of the statute, essentially replacing the word “and” between subsections B and C with the word “or.” See CAA § 108(a)(1) (“a list which includes each air pollutant—(A) emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare; (B) the presence of which in the ambient air results from numerous or diverse mobile or stationary sources; and (C) for which air quality criteria had not been issued before the date of enactment of the Clean Air Amendments of 1970, but for which he plans to issue air quality criteria under this section”) (emphasis added).

<sup>291</sup> *Train*, 545 F.2d at 327.

<sup>292</sup> 467 U.S. 837 (1984).

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<sup>293</sup> *Id.* at 842-846; *see also id.* at 844 (giving agency interpretations “controlling weight unless they are arbitrary, capricious, or manifestly contrary to the statute”).

<sup>294</sup> *See id.* at 844 n.12-13 (citing earlier Supreme Court cases, including *Train v. NRDC* 421 U.S. 60 (1975)).

<sup>295</sup> *See Train*, 545 F.2d at 326 (citing legislative history indicating Congress wanted EPA to list lead within thirty days and finalize NAAQS for lead within thirteen months of enactment).

<sup>296</sup> *See Train*, 545 F.2d at 322 (including the phrase as part of quoted statutory language, but never analyzing or repeating the phrase).

<sup>297</sup> *See St. Joe Minerals Corp.*, 508 F.2d at 744 n. 3 (interpreting the phrase to grant EPA discretion, implying such an interpretation may be reasonable).

<sup>298</sup> 545 F.2d at 325-36 (citing Senator Edward Muskie’s summary of the conference agreement).

<sup>299</sup> The list of pollutants Congress “expected” would become criteria pollutants included some chemicals, like fluorides, that have never been listed as criteria pollutants, even thirty years later. *Compare id.* at 326 (citing S. REP. NO. 91-1196 (“These pollutants would include nitrogen oxides, lead, polynuclear organics, odors, and fluorides.”)) with 40 C.F.R. pt. 50 (2008) (not listing fluorides as criteria pollutants). It goes without saying that, in 1970, Congress did not expect any greenhouse gases to be listed as criteria pollutants.

<sup>300</sup> S. REP. NO. 91-1196 (1970) (emphasis added).

<sup>301</sup> *See Train*, 545 F.2d at 325.

<sup>302</sup> *Compare* CAA of 1970 § 108 (NAAQS) with CAA of 1970 § 111 (NSPS).

<sup>303</sup> *See NRDC v. Train*, 411 F. Supp. 864 (S.D.N.Y. 1976) (“One reason to enforce compliance is seen in the disagreement on the comparative rigors of the ‘adverse effect’ standard in § 108 and the ‘will endanger’ standard in § 211. The only agreement is that these two phrases represent different standards.

<sup>304</sup> CAA of 1977 § 108; *see* H.R. REP. NO. 95-294, at 49-50 (1977) (on the harmonization of standards).

<sup>305</sup> For some of the health effects of these so-called “designated pollutants,” *see* Approval and Promulgation of State Plans for Designated Facilities and Pollutants; Texas; Control of Emissions from Existing Hospital/Medical/Infectious Waste Incinerators, 66 Fed. Reg. 49834, 49835 (Oct. 1, 2001) (to be codified at 40 C.F.R. pt. 62) (listing the health effects of hydrochloric acid, dioxin, and furans).

<sup>306</sup> The bracketed language indicates a discrepancy in the amendments made by the House legislation versus the Senate legislation. For an explanation, *see* Revision of December 2000 Regulatory Finding on the Emissions of Hazardous Air Pollutants from Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Generating Units from the Section 112(c) List, 70 Fed. Reg. 15994 (Mar. 29, 2005) (to be codified at 40 C.F.R. pt. 63). The possible interpretations and resolutions of this discrepancy do not affect this analysis.

<sup>307</sup> Adoption and Submittal of State Plans for Designated Facilities—Definitions, 40 C.F.R. § 60.21(a) (2008) (“Designated pollutant means any air pollutant, the emissions of which are subject to a standard of performance for new stationary sources, but for which air quality criteria have not been issued and that is not included on a list published under section 108(a) of the Act. Designated pollutant also means any air pollutant, the emissions of which are subject to a standard of performance for new stationary sources, that is on the section 112(b)(1) list and is emitted from a facility that is not part of a source category regulated under section 112. Designated pollutant does not include pollutants on the section 112(b)(1) list that are emitted from a facility that is part of a source category regulated under section 112.”).

<sup>308</sup> *See* Standards of Performance for New Stationary Sources, 40 C.F.R. pt 60 (2008). Note especially fluorides, which Congress listed in 1970 as an “expected” criteria pollutant. *See supra* note 300.

<sup>309</sup> Many designated pollutants are specific to only a few types of sources. Arguably, the various hospital/medical/infectious waste incinerators, municipal solid waste incinerators, and commercial/industrial solid waste incinerators existing nationwide that emit these designated pollutants may be numerous or diverse enough to qualify. But their value as evidential proof in this analysis is somewhat compromised because they are regulated jointly under Section 111(d) and Section 129 (specifically on incinerators).

<sup>310</sup> See also *Alabama Power Co. v. Costle*, 636 F.2d 323, n.134 (D.C. Cir. 1979) (“EPA has discretion to define the pollutant termed ‘particulate matter’ to exclude particulates of a size or composition determined not to present substantial public health or welfare concerns. Such ‘excluded particulates’ would remain ‘air pollutants’ within the meaning of the Act, section 302(g), but would be dropped from the list of pollutants compiled by EPA Administrator under section 108(a)(1)—a list comprised of air pollutants the ‘emissions of which, in his judgment, cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare.’ Since national ambient air quality standards may exist only for those pollutants lists under section 108(a)(1), ‘excluded particulates’ would not be subject to NAAQS. However, under section 111(b)(1)(A) the Administrator must compile a list of categories of stationary sources that in his judgment ‘(cause or contribute) significantly to, air pollution which may reasonably be anticipated to endanger public health or welfare.’ This list could include sources of ‘particulate matter,’ as newly defined, even though the great preponderance of particulates emitted by such sources have become ‘excluded particulates.’ ...Section 111(d)(1) grants authority to the Administrator to establish standards of performance for any air pollutant emitted by a source on the list compiled under section 111(b)(1)(A). Thus, due to the difference in focus of sections 108 and 111—one on pollutants and the other on sources—a standard of performance might be developed governing ‘excluded particulates’ though no NAAQS has been promulgated.”) (emphasis added).

<sup>311</sup> Although note that once EPA does make an endangerment finding, regulation under some section of the Clean Air Act is required; EPA cannot then simply take no action. CAA § 122 (“he shall”). But the choice of which regulatory response to take is left up to EPA.

<sup>312</sup> 415 F.3d 50, 57-58 (D.C. Cir. 2005).

<sup>313</sup> The argument for unworkability may not apply; NAAQS may not be as unworkable as some think. See *infra* Chapter 5(C).

<sup>314</sup> See Appendix for more on the absurd results canon.

<sup>315</sup> See *supra* note 282 (citing testimony of environmental advocates and industry trade organizations).

<sup>316</sup> Tropospheric ozone and particulate matter have relatively localized ambient concentrations, and thus states could effectively attain and maintain lower concentration levels within their own borders. Compare Chapter 5(C) on the workability problems for applying NAAQS to GHGs that do not have localized concentrations, but instead become well-mixed throughout the atmosphere.

<sup>317</sup> NAT’L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, VOL. I, *supra* note 9, at 1-4.

<sup>318</sup> See *id.* at ch.4-5.

<sup>319</sup> “Black” carbon includes various mixtures containing “elemental” (graphitic) carbon; partially degraded, oxidized graphitic fragments; and partially oxidized amorphous aromatic carbon. *Id.* at 2-97; see also *id.* at 2-37 (“The major constituents of atmospheric PM are sulfate, nitrate, ammonium, and hydrogen ions; particle-bound water; elemental or black carbon; a great variety of organic compounds; and crustal material.”). The contribution of elemental carbon to fine particulate matter ranges nationally from about 4% to about 15%; ultrafine particulate matter is about 3.5% to 17.5% elemental carbon. *Id.* at 3-4.

<sup>320</sup> *Id.* at 4-92 (“Aerosols produced by incomplete combustion, from forest fires to specifically anthropogenic processes such as diesel fuel combustion, contain significant fractions of black carbon which absorbs across the solar and terrestrial radiation spectra.”).

<sup>321</sup> *Black Carbon and Climate Change: Hearing Before the H. Comm. on Oversight and Government Reform*, 110th Cong. (2007) (statement of Tami C. Bond, asst. professor, University of Illinois), available at <http://oversight.house.gov/documents/20071018110647.pdf>; Press Release, House Committee on Oversight and Government Reform, Hearing Examines Black Carbon and Global Warming (Oct. 18, 2007), available at <http://oversight.house.gov/story.asp?ID=1550> (“Emissions studies suggest that approximately one-third of black carbon emissions come from biomass burning sources such as waste combustion and wood-fired stoves, and the remainder come from fossil fuel burning sources such as diesel engines. Installing particle traps on diesel engines, regulating the shipping industry, transitioning to alternative fuels, and more efficient stoves in the developing world are but a few examples of existing technologies that could be employed to decrease global black carbon emissions.”). The main source of U.S. soot is nonroad vehicles, followed by on-road vehicles, stack emissions, and fugitive sources. Black carbon is emitted by the burning of diesel fuel, heavy fuel oil, aviation fuel, liquefied petroleum gas, gasoline, kerosene, coke briquettes, hard coal, brown

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coal, peat, coking coal, and fuel waste. *Black Carbon and Climate Change: Hearing Before the H. Comm. on Oversight and Government Reform*, 110th Cong. (2007) (statement of Mark Jacobson, professor, Stanford University), available at <http://oversight.house.gov/documents/20071018110606.pdf> [hereinafter Jacobson Testimony].

<sup>322</sup> *Black Carbon and Climate Change: Hearing Before the H. Comm. on Oversight and Government Reform*, 110th Cong. (2007) (statement of V. Ramanathan, Scripps Institution of Oceanography), available at <http://oversight.house.gov/documents/20071018110734.pdf>. In addition to the above direct effects, black carbon solar heating is linked with evaporation of low clouds, which is another source of positive radiative forcing. *Id.*; see also NAT'L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, *supra* note 9, at 2B-8 (reporting the conversion of black carbon into carbon dioxide).

<sup>323</sup> Jacobson Testimony, *supra* note 321 (noting the U.S. contribution to non-aircraft, non-shipping global soot).

<sup>324</sup> See Interview by Monica Trauzzi, managing editor, E&E TV, with Durwood Zaelke, president, Institute for Governance and Sustainable Development (Mar. 12, 2009); John Lash, *Black Carbon an Easy Target for Climate Change*, POLICY INNOVATIONS, Feb. 9, 2009, available at <http://www.policyinnovations.org/ideas/innovations/data/000084>.

<sup>325</sup> See Proposed Endangerment Finding, *supra* note 112.

<sup>326</sup> Jacobson Testimony, *supra* note 321.

<sup>327</sup> NAT'L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, *supra* note 9, at 4-219 ("The specific impacts on human health and the environment due to aerosol effects on the climate system can not be calculated with confidence given the present difficulty in accurately modeling an aerosol's physical, chemical, and temporal properties and its regionally dependent atmospheric concentration levels, combined with the difficulties of projecting location-specific increases or decreases in anthropogenic emissions of atmospheric particles (or their precursors). However, substantial qualitative information, from observation and modeling, indicates that aerosol forces climate both positively and negatively, globally and regionally, and may be negatively impacting hydrological cycles on a regional scale. Global and other regional scale impacts are suspected on the basis of current, though uncertain, modeling studies suggesting that climate change in general can have positive and negative effects on human health, human welfare, and the environment. . . . The IPCC characterizes the scientific understanding of GHG-related forcing as 'high' in contrast to that for aerosol, which it describes as 'low' to 'very low.'").

<sup>328</sup> OFFICE OF AIR QUALITY PLANNING AND STANDARDS, EPA, OAQPS STAFF PAPER NO. 452/R-05-005A, REVIEW OF NATIONAL AMBIENT AIR QUALITY STANDARDS FOR PARTICULATE MATTER: POLICY ASSESSMENT OF SCIENTIFIC AND TECHNICAL INFORMATION 7-17 (2005).

<sup>329</sup> *Am. Farm Bureau Fed. v. EPA*, No. 06-1410, 2009 U.S. App. LEXIS 3562 (D.C. Cir. Feb. 24, 2009).

<sup>330</sup> *Id.* at \*21 (citing *Chamber of Commerce of U.S. v. SEC*, 412 F.3d 133, 140 (D.C. Cir. 2005) and *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)).

<sup>331</sup> See *Massachusetts v. EPA*, 549 U.S. at 534 ("Nor can EPA avoid its statutory obligation by noting the uncertainty surrounding various features of climate change and concluding that it would therefore be better not to regulate at this time. If the scientific uncertainty is so profound that it precludes EPA from making a reasoned judgment as to whether greenhouse gases contribute to global warming, EPA must say so. That EPA would prefer not to regulate greenhouse gases because of some residual uncertainty . . . is irrelevant.").

<sup>332</sup> See Jacobson Testimony, *supra* note 321.

<sup>333</sup> See Press Release, House Committee on Oversight and Government Reform, Hearing Examines Black Carbon and Global Warming (Oct. 18, 2007) (available at <http://oversight.house.gov/story.asp?ID=1550>).

<sup>334</sup> See NAT'L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS, *supra* note 9, at E-1 to E-30.

<sup>335</sup> See *id.* at E-32.

<sup>336</sup> National Ambient Air Quality Standards for Ozone, 73 Fed. Reg. 16436 (Mar. 27, 2008).

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<sup>337</sup> OFFICE OF AIR QUALITY PLANNING AND STANDARDS, EPA, OAQPS STAFF PAPER NO. 452/R-07-007, REVIEW OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS FOR OZONE: POLICY ASSESSMENT OF SCIENTIFIC AND TECHNICAL INFORMATION 7-2 (2007).

<sup>338</sup> CAA § 110(d)(1).

<sup>339</sup> See Unopposed Motion to Vacate the Briefing Schedule and Hold These Consolidated Cases in Abeyance, *Mississippi v. EPA*, No. 08-1200 (D.C. Cir. filed Mar. 10, 2009), available at <http://www.epa.gov/ttn/naaqs/standards/ozone/data/20090310motion.pdf>.

<sup>340</sup> S. Rep. No. 91-1196 (“It is irrelevant that the current state of scientific knowledge may make it difficult to set an ambient air quality standard. The Administrator must proceed in spite of such difficulties.”).

<sup>341</sup> EPA has also developed a “minor” NSR program under CAA § 110(a)(2)(C) for smaller sources, but the requirements are not very prescriptive and their practical significance is limited. See Review of New Sources and Modifications, 40 C.F.R. pt. 51(I) (2008).

<sup>342</sup> See CAA § 169(2)(C) (defining construction to include “modification” as defined in § 111(a)); § 171(4) (defining “modification” by reference to § 111(a)(4)); § 111(a)(4) (“The term ‘modification’ means any physical change in, or change in the method of operation of, a stationary source which increases the amount of any air pollutant emitted by such source or which results in the emission of any air pollutant not previously emitted.”). EPA has exercised its authority to make *de minimis* exemptions by restricting application to “major modifications,” as defined at 40 C.F.R. § 51.165(a)(1)(v)(A) (2008).

<sup>343</sup> In addition to attainment areas, PSD also applies to unclassifiable areas. CAA § 161.

<sup>344</sup> A successful permit applicant must ensure that the new or modified source’s extra emissions will not violate NAAQS or increase air pollution beyond a set “increment.” Increments and the other requirements of the PSD program depend on the area’s “class” level. Special provisions apply for “Class I” areas, which include national parks, wildernesses, and other protected areas. For a more detailed description of the full range of requirements for PSD permits and state plans, see CAA tit. I pt. C; and see generally Gregory B. Foote, *Considering Alternatives: The Case for Limiting CO<sub>2</sub> Emissions from New Power Plants Through New Source Review*, 34 E.L.R. 10642 (2004).

<sup>345</sup> See EPA, EPA New Source Review Where You Live, <http://www.epa.gov/nsr/where.html> (last updated February 2009) (showing a map of PSD permit program status); *id.* (“Most NSR permits are issued by state or local air pollution control agencies. . . . In some cases, state or local air pollution control agencies have not developed a unique NSR program and rely completely on EPA’s NSR program. These states are delegated the authority to issue permits on behalf of EPA and are often referred to as ‘delegated states.’ Finally, EPA is the permitting authority in some areas.”).

<sup>346</sup> See *Alabama Power Co. v. Costle*, 636 F.2d 323, 350 (D.C. Cir. 1979). This is likely to be the case, since most areas of the country are in attainment for at least one criteria pollutant. See Foote, *supra* note 344, at 10645, n.35.

<sup>347</sup> See CAA § 172. For a more detailed description of the full range of requirements for NNSR permits and state plans, see CAA tit. I pt. D; and see Foote, *supra* note 344, at 10644.

<sup>348</sup> Some extensions of these deadlines are allowed. CAA § 172(a)(2)(C).

<sup>349</sup> NSR would apply inevitably, but not immediately. CAA § 166(a) (“In the case of pollutants for which national ambient air quality standards are promulgated after the date of enactment of this part, [EPA] *shall* promulgate such regulations [to prevent the significant deterioration of air quality] not more than 2 years after the date of promulgation of such standards.”). Similarly, designation of areas as attainment or nonattainment does not happen immediately. CAA § 107(d) (“By such date as the Administrator may reasonably require, but not later than 1 year after promulgation of a new or revised national ambient air quality standard for any pollutant under section 109, the Governor of each State shall (and at any other time the Governor of a State deems appropriate the Governor may) submit to the Administrator a list of all areas (or portions thereof) in the State, designating...”).

<sup>350</sup> CAA § 165(a)(4) (emphasis added); see also CAA § 169(3) (defining “best available control technology” as “an emissions limitation based on the maximum degree of reduction of *each pollutant subject to regulation under this Act* emitted...from any major emitting facility”) (emphasis added).

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<sup>351</sup> Note that every regulated pollutant is not included, since Section 112(b)(6) exempts listed hazardous air pollutants. Also, while greenhouse gas emissions are regulated under Section 211(o)'s renewable fuel standards, Section 211(o)(12) states that such regulations do not change "the regulatory status of carbon dioxide or any other greenhouse gas...for purposes of other provisions (including section 165) of this Act."

<sup>352</sup> See Letter from R. Bruce Johnson, U.S. Chamber of Commerce, to the Members of the U.S. Congress (Jan. 29, 2009), *available at* [https://www.uschamber.com/issues/letters/2009/090129\\_letter\\_fix\\_nepa.htm](https://www.uschamber.com/issues/letters/2009/090129_letter_fix_nepa.htm) ("[G]reenhouse gases are on the verge of being 'subject to regulation' and triggering PSD and Title V. Environmental groups have signaled their intent to argue that the California waiver to regulate motor vehicle emissions crosses this threshold. Although this argument has questionable legal justification, in practical terms it means that the lawsuits have already started.").

<sup>353</sup> See *Deseret Power Electric Cooperative*, PSD Appeal No. 07-03 (E.A.B. Nov. 13, 2008).

<sup>354</sup> See, e.g., CAA § 211(o) (regulating greenhouse gases under the renewable fuel standard, but specifically stating that such regulations do not change "the regulatory status of carbon dioxide or any other greenhouse gas...for purposes of other provisions (including section 165) of this Act"). Additionally, HFCs, PFCs, and SF<sub>6</sub> are to some extent restricted under Title VI of the Act: those gases can be substitutes for the ozone-depleting chemicals that Title VI targets, and EPA is instructed to approve or disapprove of certain substitutes. CAA § 612. EPA has approved use of those three GHGs as substitutes in limited circumstances. See *Substitutes Subject to Use Restrictions and Unacceptable Substitutes*, 40 C.F.R. pt. 82 Appendices (2008).

<sup>355</sup> CAA § 821; see *Specific Provisions for Monitoring CO<sub>2</sub> Emissions*, 40 C.F.R. § 57.13 (2008).

<sup>356</sup> *Mandating Reporting of Greenhouse Gases*; Proposed Rule, 74 Fed. Reg. 16447 (Apr. 10, 2009) (to be codified at 40 C.F.R. Parts 86, 87, 89, 90, 94, 98, 600, 1033, 1039, 1042, 1045, 1048, 1051, 1054, 1065). Even if monitoring regulations satisfy the definition of "regulation," another question of statutory interpretation is whether pollutants are already "subject to" regulation under proposed (but not yet finalized) regulations. "Subject to" is open to two conflicting interpretations. The American Heritage Dictionary defines "to subject" as both "to submit to the authority of" and "to expose to something." Therefore, "pollutant subject to regulation" could refer to pollutants that are already regulated, or to pollutants for which EPA has authority to regulate. The difference could be crucial for greenhouse gases not currently regulated under the Clean Air Act, but for which EPA now has authority to regulate as "air pollutants" after *Massachusetts v. EPA*. Likely, the plain text, legislative history, and statutory structure would support extending the scope only to pollutants already regulated.

<sup>357</sup> *Deseret Power Electric Cooperative*, *supra* note 353. In that case, the Deseret Power Electric Cooperative had applied for a preconstruction PSD permit for a new electric generating unit at its Bonanza Power Plant. The Bonanza Plant is located on the Uintah and Ouray Indian Reservation in Utah, making EPA the permitting authority; the area is in attainment for all NAAQS. The proposed addition of a new combustion unit qualified as a "major modification" at a "major emitting facility," thus requiring a preconstruction PSD permit. EPA had issued the PSD permit without requiring the installation of BACT for carbon dioxide emissions; and environmental group challenged the permit. In November 2008, the Environmental Appeals Board remanded the case to EPA on that and other grounds.

<sup>358</sup> See *generally id.* The various arguments over statutory interpretation are presented and explored in much greater detail in the Board's decisions and are worth reviewing. In particular, note that EPA's interpretation was not limited to controls by emissions standards, but would instead be broad enough to cover the production and import controls on ozone-depleting substances. EPA simply did not feel that monitoring regulations were sufficient. See *id.* at n.27.

In December 2008, EPA released a memorandum in response to the Board's remand; that memorandum intended to reaffirm EPA's original interpretations as a clear and nationally-applicable standard. See Memorandum from Stephen Johnson, EPA Administrator, to Regional EPA Administrators, EPA's Interpretation of Regulations that Determine Pollutants Covered by Federal Prevention of Significant Deterioration (PSD) Permit Program (Dec. 18, 2008).

<sup>359</sup> Some legislative history suggests that interpreting the statute to apply only to pollutants regulated by specific controls may be reasonable. While Congress may not have elaborated on the meaning of "pollutant[s] subject to regulation," Members did discuss the interchangeable term "regulated pollutants." When drafting

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the 1977 amendments that created the PSD program, the Senate Committee Report wrote: “The bill contains increments for only two pollutants: particulate matter and sulfur oxides (calculated as sulfur dioxide). EPA, however, is required to study strategies to prevent significant deterioration for *other regulated pollutants*,” meaning “hydrocarbons, carbon monoxide, photochemical oxidants, and nitrogen oxides.” S. Rep. No. 95-127 (1977). In short, “regulated pollutants” seems to refer only to the criteria pollutants. Similarly, Senator Edward Muskie, a principal sponsor of the 1977 amendments creating the PSD program, explained the intended scope of BACT requirements:

The [Senate] committee did not extend the use of nondegradation increments to pollutants other than sulfur oxides or particula[te matter]. The lack of adequate information on the implications of covering *other criteria pollutants* precluded such a requirement. The committee did, *however*, agree that the *best available control technology requirements should be applicable to all pollutants* emitted from any new major emitting facility .... And the committee did authorize a study by EPA of increments applicable to *other pollutants* in order to establish a basis for future congressional action.

Though Muskie used the phrase “all pollutants” with no limitations, the syntax of the statement does suggest a limitation: i.e., though Congress did not extend increments to the other criteria pollutants, it did extend BACT. The syntax suggests that by “all pollutants,” Muskie may have only meant all criteria pollutants. Indeed, Muskie did not mean *all* pollutants, since the text of the legislation only referenced regulated pollutants

Furthermore, when discussing a substantially similar bill in 1976, Senator Muskie submitted a memorandum into the Congressional Record. The memorandum included a table detailing the “increments which would be suggested for other regulated pollutants *should the Members decide to cover all regulated pollutants* in such a classification scheme.” That table only listed three pollutants: nitrogen dioxide, carbon monoxide, and hydrocarbons. See 122 Cong. Rec. S12557 (daily ed. July 27, 1976) (submitting memorandum from subcommittee staff, *Subject Growth Allowed Within EPA's Nondegradation Scheme*)

Some evidence from various House Reports seems to confirm that, like the Senate, the House felt “regulated pollutants” meant the criteria pollutants. In his minority view of the House Report, under a section called “Regulated Pollutants,” Rep. David Satterfield said “In fact, EPA has pointedly excluded *the other four regulated pollutants* of carbon monoxide, nitrogen dioxide, hydrocarbons, and photochemical oxidants from its significant deterioration regulations.” H.R. Rep. No. 94-1175 (1975). Rep. Dave Stockman also implicitly defined “regulated pollutants” as the criteria pollutants when discussing the PSD program in his minority view of a subsequent House Report. H.R. Rep. No. 95-294 (1976) (discussing “regulated pollutants” and referring to sixteen national standards, a reference to NAAQS).

Finally, in 2007, Congress passed the Energy Independence and Security Act (EISA), modifying the Clean Air Act to increase required renewable fuel content and thereby reduce greenhouse gas emissions. EISA explicitly declared that by targeting greenhouse gas emissions, it did not change “the regulatory status of carbon dioxide or any other greenhouse gas...for purposes of other provisions (including section 165) of this Act.” EISA of 2007 (codified at CAA § 211(o)). In short, Congress today does not interpret the Clean Air Act to apply BACT to greenhouse gases.

<sup>360</sup> Several states adopted that opinion in an amicus brief submitted in *Deseret*. Brief of Amici Curiae States of New York, California, Connecticut, Delaware, Maine, Massachusetts, Rhode Island, and Vermont in Support of Petitioners, *Deseret Power Electric Company*, *supra* note 353, (filed Jan. 31, 2008). Furthermore, Kansas has already refused a PSD permit on the grounds that a proposed power plant did not provide BACT for carbon dioxide. Note that the Kansas Legislature is currently considering a bill to overturn the actions of the governor’s office on this issue. Similar bills failed to pass by veto-proof margin in the previous year. Additionally, the power plant has sued the governor in federal court claiming a constitutional equal protection violation. See Tim Carpenter, *House Advances Coal Plant Bill*, TOPEKA CAPITAL-JOURNAL, Feb. 27, 2009; *Sunflower Sues Kan. Over Plant Permit*, E&E DAILY NEWS, Nov. 19, 2008.

<sup>361</sup> See Memorandum from Johnson, *supra* note 164 (confirming that states can make their own interpretations under existing SIPs, although the approval of future SIPs may be impacted by interpretation; EPA can only indirectly influence state interpretations of the phrase under their already-approved SIPs); see also Letter from Lisa Jackson, EPA Administrator, to David Bookbinder, chief climate counsel, Sierra Club (Feb. 17, 2009).



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<sup>362</sup> See Letter from Jackson, *supra* note 361 (writing in response to the Sierra Club's law suit challenging former Administrator Johnson's December 2008 memorandum).

<sup>363</sup> The 28 specific source categories are: fossil-fuel fired steam electric plants of more than two hundred and fifty million British thermal units per hour heat input, coal cleaning plants (thermal dryers), kraft pulp mills, Portland Cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than fifty tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process) primary lead smelters, fuel conversion plants, sintering plants, secondary metal production facilities, chemical process plants, fossil-fuel boilers of more than two hundred and fifty million British thermal units per hour heat input, petroleum storage and transfer facilities with a capacity exceeding three hundred thousand barrels, taconite ore processing facilities, glass fiber processing plants, charcoal production facilities. CAA § 169(1).

<sup>364</sup> Section 302(j)'s definition of "major emitting facility," which applies to NNSR permitting, also references "any pollutant." However, NNSR is pollutant-specific, and only major sources of the relevant criteria pollutant count as major emitting facilities. Section 302(j)'s definition applies "[e]xcept as otherwise expressly provided," and therefore the word "any" can be viewed as modified by the express scope of CAA tit. I pt. D. For example, the point of NNSR permit requirements, such as offsets, is to achieve "reasonable further progress." See CAA § 173(a)(1)(A). "Reasonable further progress" is defined with respect to "emission of the relevant pollutant . . . for the purposes of ensuring attainment of the applicable national ambient air quality standard." CAA § 171(1). NNSR permitting only serves its intended purpose if the source is major specifically for the pollutant in non-attainment. The legislative history supports that NNSR was to apply to major sources of criteria pollutants only. See H.R. REP. NO. 95-564 (conf. report), at 172 (1977) (noting that the House bill originally restricted its definition of major source to criteria pollutants, but the Senate added a separate definition specifically for PSD that applied to "any pollutant").

<sup>365</sup> See *supra* Chapter 1, section B; Chapter 2, section A.

<sup>366</sup> Union of Concerned Scientists, How Coal Works, [http://www.ucsusa.org/clean\\_energy/technology\\_and\\_impacts/energy\\_technologies/how-coal-works.html](http://www.ucsusa.org/clean_energy/technology_and_impacts/energy_technologies/how-coal-works.html) (last visited Apr. 20, 2009). Non-CO<sub>2</sub> gases are generally emitted in lower quantities than carbon dioxide. But consider that the Bonanza Power Plant under dispute in the *Deseret* case, see *supra* note 353, would have emitted 3609 tons of nitrous oxide per year. See Letter from Western Resource Advocates et al., to Mike Owens, EPA Region 8, available at [http://yosemite.epa.gov/oa/EAB\\_Web\\_Docket.nsf/Filings%20By%20Appeal%20Number/D3D96202AB21FA76852574B20048DFB6/\\$File/Sierra...10000.pdf](http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/Filings%20By%20Appeal%20Number/D3D96202AB21FA76852574B20048DFB6/$File/Sierra...10000.pdf).

<sup>367</sup> See *U.S. Environmental Protection Agency's Response to the Supreme Court's Decision in Massachusetts v. EPA: Hearing Before the H. Select Comm. On Energy Independence and Global Warming*, 110th Cong. (2008) (testimony of Peter Glaser) (listing the affected sources: "many office and apartment buildings; hotels; enclosed malls; large retail stores and warehouses; college buildings; hospitals and large assisted living facilities; large houses of worship; produce pipelines; food processing facilities; large heated agricultural facilities; indoor sports arenas and other large public assembly buildings; restaurants; soda manufacturers; bakers, breweries and wineries; and many others"); see also *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. on Environment and Public Works*, 110th Cong. (2008) (statement of William Kovacs, U.S. Chamber of Commerce) (reporting that 260,000 office buildings, 150,000 warehouses, 92,000 health care facilities, 71,000 hotels and motels, 51,000 food service facilities, 37,00 places of worship, and 17,000 will be newly exposed to PSD requirements because of GHG emissions).

<sup>368</sup> See CAA § 169(2)(C) (referencing the definition in Section 111(a)).

<sup>369</sup> EPA restricts the scope to "major modifications" and defines significance levels for when an emissions increase of a particular pollutant counts. But if no significance level is defined—and none have been for greenhouse gases—then the threshold is any emissions increase. See 40 C.F.R. § 51.165(a)(1)(v)(A) (2008). EPA can set a significance level by regulation and may also be able to exempt truly *de minimis* increases.

<sup>370</sup> Note that this is only the source's potential to emit, assuming maximum operating capacity of one griddle, two ovens, two six-eye range tops, two fryers, one dishwasher, and one water heater, which would use over eleven billion BTUs of energy if operated the entire day, year-round. If using an actual emissions model,

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assuming two full hours each day of use for each appliance, emissions would be considerably less. See Natural Gas Supply Association, Natural Gas and the Environment, <http://www.naturalgas.org/environment/naturalgas.asp> (last visited Apr. 20, 2009); TOM STROOZAS, GAS FOODSERVICE EQUIPMENT NETWORK, THE RESTAURANT FOOTPRINT: HOW BIG IS IT? (2008), available at <http://www.gfen.com/pdf/articles/cookinggas0408.pdf>.

<sup>371</sup> See Union of Concerned Scientists, *supra* note 366.

<sup>372</sup> Significance levels for various pollutants are set at: 100 tons per year (tpy) for carbon monoxide; 40 tpy for nitrogen oxides, sulfur dioxide or ozone; 25 tpy for particulate matter; 0.6 tpy for lead; 3 tpy for fluorides; 7 tpy for sulfuric acid mist; and 10 tpy for hydrogen sulfide. 40 C.F.R. § 51.165(a)(1)(x) (2008) (defining “significance”).

<sup>373</sup> *Alabama Power*, 636 F.2d at 352.

<sup>374</sup> *Id.* at n.60.

<sup>375</sup> 43 Fed. Reg. 26403 (June 19, 1978) (to be codified at 40 C.F.R. § 52.21 (defining “major stationary source” as: “(i) Any of the following stationary sources of air pollutants which emit, or have the potential to emit, 100 tons per year or more of *any air pollutant regulated under the Clean Air Act* . . . and (ii) . . . any source which emits, or has the potential to emit, 250 tons per year or more of *any pollutant regulated under the Act*”). After *Alabama Power* remanded EPA’s rules on PSD, EPA slightly changed the definition of “major stationary source,” but kept the limitation to “any pollutant subject to regulation under the Act.” See 45 Fed. Reg. 52735 (Aug. 7, 1980) (to be codified at 40 C.F.R. pt. 51).

<sup>376</sup> See Gary McCutchen, *New Source Review: The Hazardous Interpretation of “Regulated NSR Pollutant,”* PERSPECTIVES, Feb. 1, 2006.

<sup>377</sup> *Id.*

<sup>378</sup> 67 Fed. Reg. 80186 (Dec. 31, 2002) (codified at 40 C.F.R. pt. 51). “Regulated NSR pollutant” is a term and definition EPA continues to use today, most recently on December 19, 2008, see 73 Fed. Reg. 77883 (defining “fugitive emissions”).

<sup>379</sup> For example, New Mexico petitioned EPA to withdraw a PSD permit the federal agency had issued for a power plant to be built on a Navajo Indian Reservation located within New Mexico (EPA has PSD jurisdiction over certain tribal regions). Arguing that the permit should require the plant to install BACT for carbon dioxide, New Mexico noted that the plant was a “major emitting facility” under Section 169(1) because it “emits, or has the potential to emit, one hundred tons per year or more of *any air pollutant*.” State of New Mexico’s Petition for Review and Supplemental Brief at 31, PSD Appeal No. 08-03 and 08-04 (E.A.B., filed Oct. 1, 2008). In particular, New Mexico noted that the plant would emit approximately 11.2 million metric tons per year of carbon dioxide. *Id.* at n.14. New Mexico also believed that carbon dioxide was a “regulated” pollutant. *Id.*

<sup>380</sup> Even though non-CO2 greenhouse gases are emitted in lower quantities and will trigger the definition of “major source” less often, any increase in such emissions might make a modification into a “major modification.”

<sup>381</sup> *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. on Env’t & Pub. Works*, 110th Cong. (2008) (statement of David Bookbinder, Sierra Club); *U.S. Environmental Protection Agency’s Response to the Supreme Court’s Decision in Massachusetts v. EPA: Hearing Before the H. Select Comm. On Energy Independence and Global Warming*, 110th Cong. (2008) (testimony of Peter Glaser).

<sup>382</sup> *United States v. Ron Pair Enterprises, Inc.*, 489 U.S. 235, 242 (1989); see also Appendix.

<sup>383</sup> *Massachusetts v. EPA*, 415 F.3d 50, 68 (J. Tatel, dissenting) (citing *Appalachian Power Company v. EPA*, 249 F.3d 1032, 1041 (D.C. Cir. 2001)) (discussing what is required to depart from the plain text of “air pollutant”).

<sup>384</sup> *Alabama Power*, 636 F.2d at 359-60.

<sup>385</sup> As *Alabama Power* noted—in a vast understatement—the legislative history on PSD’s scope “is not entirely unambiguous.” *Id.* at n.80. Even though *Alabama Power* interpreted Section 169(1) strictly and broadly, the court also acknowledged the serious “ramifications” of applying PSD requirements. As such, the court felt that Congress only intended to regulate “facilities which, due to their size, are financially able to bear the substantial regulatory costs imposed by the PSD provisions and which, as a group, are primarily responsible

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for emission of the deleterious pollutants.” *Id.* at 353. More specifically, the court felt that sources like “the heating plant operating in a large high school” are “obviously minor,” and the court could find “no reason to believe that Congress intended” to regulate such sources under the PSD program. *Id.* at 354.

On the other hand, a great deal of historical evidence does suggest that Congress intended the phrase “any air pollutant” to mean *any* air pollutant. The House-Senate compromise on the language of Section 169(1) reflects a deliberate broadening of scope. While the House version of the 1977 amendments would have defined “major stationary source” to mean only sources of criteria pollutants, H.R. 6161, 95th Cong. (1977) (“one hundred tons per year or more of *any air pollutant for which a national ambient air quality standard is promulgated under this Act*”); *see also* H.R. Rep. No. 95-294, at 145 (1977) (explaining the committee had gone “to extraordinary lengths to assure that this legislation . . . would not cause . . . even a temporary moratorium on planned industrial and economic development.”), the Conference Committee specifically followed the Senate’s language and referred to “any air pollutant.” H.R. Rep. No. 95-564 (conf. report) (1977).

Similarly, whereas the Senate originally wanted to restrict the definition of “major emitting facility” to a few source categories, *see* S. Rep. No. 95-127 (1977) (deliberately choosing not to use a “broad definition in delineating major facilities” because the PSD permitting process could “prove costly and potentially unreasonable if imposed on [small sources.]”); *see also* 122 Cong. Rec. S3902 (daily ed. Mar. 22, 1976) (submission of an article by Sen. Pete Domenici) (“Such specificity . . . greatly reduc[es] the potential for unanticipated anomalies that could come back to haunt the law and its supporters.”), the House insisted on including a broader provision applying to all sources that emit 250 tons per year or more. H.R. Rep. No. 94-1742 (conf. report), at 115 (1976) (“The House concurs in the Senate provisions on ‘major emitting facility’ with a requirement that, for the purpose of prevention of significant deterioration, a major emitting facility will also include facilities which have the capacity to emit 250 tons per year or more.”). In short, despite having the option to restrict the pollutants or sources covered, the Conference Committee chose deliberately broad language.

Additionally, legislative history does not unambiguously demonstrate that Congress did not intend for small sources ever to come under the financial burdens of regulation. The Senate Committee Report did suggest that applying PSD permitting to such source would be “costly and potentially unreasonable,” but the Report does not clarify whether the concern was for the compliance cost of regulated parties or for the administrative cost of state and federal agencies. Certainly, some Members of Congress expressed the need to protect small sources from “overzealous regulation” 122 Cong. Rec. S12809 (daily ed. July 29, 1976) (submission by Sen. McClure of a report) (“However, a point source which has this potential [to emit 100 tons] is in many cases quite small. For example, a municipal incinerator for a community of 7000 people, an oil-fired heating system for a 3000-student high school, a typical beer processing plant, or most average sized commercial and industrial boilers (not fired by gas) all have a pollution potential greater than 100 tons per year. Fortunately, most truly small boilers and typical space heating operations would not be covered.”). However, others focused more on the administrative realities. For example, Senator Edward Muskie, the principal Senate sponsor of the 1977 Amendments, said: “By the fact that the Federal Government has withdrawn from the field of regulation . . . certain kinds of minor emitting sources, and certain kinds of small businesses does not in any way suggest that decisions regarding these facilities and sources can be ignored. . . [R]egulation of small sources, vapor recovery from moderate to small-sized service stations all continue to be tools in the State and local air pollution control bag. That they cannot be imposed by the Federal Government is *only a recognition that the manner by which they are imposed, the pace at which they are imposed, and the degree to which they are imposed* should be made as a part of a local balancing judgment.”) 123 Cong. Rec. S13697 (statement of Sen. Muskie). In particular, Muskie believed that PSD permitting should not be applied to “houses, dairies, farms, highways, hospitals, schools, grocery stores, and other such sources.” *Id.* at S12480.

In other words, the goal was not necessarily to exempt all small sources from regulation, but rather to give regulators some flexibility in the implementation of the statute. Senator Gary Hart said: “As I understand it, the intent of the committee in exempting non-major sources from the act was *to simplify implementation* by limiting regulation to the largest potential polluters. Superficially, at least, this appears to make good sense. Regulations and permits which would cover all emission sources would pose an intolerable regulatory burden, undoubtedly causing more problems than they would solve. . . . [Though] [r]esidential, commercial and institutional facilities resulting from general area-wide growth play a significant role in determining overall air quality, . . . I acknowledge that it would be next to impossible to extend rigid emission control

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measures to all sources. We must focus our attention on the *biggest problems first*—and with respect to emission limitations, that means concentrating on major sources.” 122 Cong. Rec. S12470 (daily ed. July 26, 1976). Importantly, Senator Hart also spoke of the overall goal of the Clean Air Act. While acknowledging the practical necessities of exempting smaller sources, ultimately he felt that “eliminating consideration of pollutants contributed by non-major facilities constructed after enactment is entirely contrary to the intent and purpose of the Clean Air Act itself. Sulfur dioxide is sulfur dioxide – and it doesn’t matter whether it comes from 1 large major source or from 1,000 small nonmajor sources. The effects are still the same.” *Id.*

Also noteworthy, the definition of a major source specifically exempts “nonprofit health or education institutions which have been exempted by the State.” CAA § 169(1). Two potential conclusions can be drawn from this. First, to the extent Congress was concerned that large compliance costs may accidentally fall on some entities that deserve protection, Congress singled out schools and hospitals, rather than allowing the states to exempt any overburdened source. Second, even these exemptions only apply if the states so decide. If Congress were concerned about compliance costs, it might have universally exempted schools and hospitals; instead, Congress let the states decide, presumably according to their administrative capacities.

In sum, the legislative history reveals a deliberate broadening of the definition for “major emitting facility” and does not unambiguously demonstrate that Congress did not intend for small sources to ever come under the financial burdens of regulation. Despite the potential costs and consequences of regulating greenhouse gas sources, “there exists no general administrative power to create exemptions to statutory requirements based upon the agency’s perceptions of costs and benefits.” *Alabama Power*, 636 F.2d at 354, 357.

Congressional concern over the administrative burdens of regulating small sources might justify some deviation from the strict statutory text. But agencies are only to make the narrowest deviation from text necessary to implement congressional intent. Generally, courts do not favor the creation of outright exemptions when other regulatory tools are available to make the regulatory scheme more workable. Even the “spectre of millions of applications for permits” does not necessarily excuse an agency’s creation of exemptions to a statutory prescription to regulate “any addition of any pollutant...from any point source.” *NRDC v. Costle*, 568 F.2d 1369 (D.C. Cir. 1977). The agency argued that permitting all those small sources was infeasible and would interfere with its ability to enforce against more significant sources. Before an agency can turn to exemptions, it must make full use of such available devices as general permitting, which can “accommodate within a practical regulatory scheme Congress’s clear mandate that all point sources have permits.” *Id.* (“There is also a very practical difference between a general permit and an exemption. An exemption tends to become indefinite: the problem drops out of sight, into a pool of inertia, unlikely to be recalled in the absence of crisis or a strong political protagonist. In contrast, the general or area permit approach forces the Agency to focus on the problems of specific regions and requires that the problems of the region be reconsidered at least every five years, the maximum duration of a permit.”) Reinterpreting the phrase “any air pollutant” as “regulated NSR pollutants” is not the narrowest deviation from the text that can restore congressional intent. Instead of an outright exemption, a less severe response would be for EPA to invoke administrative necessity and phase in PSD application to greenhouse gases or use a general permitting scheme. See Chapter Six for more details on this approach.

<sup>386</sup> CAA § 169(3) (emphasis added).

<sup>387</sup> *In re North County Resource Recovery Associates*, 2 E.A.D. 229, 230, 1986 EPA App. LEXIS 14 (Adm’r 1986).

<sup>388</sup> *Id.*

<sup>389</sup> CAA §§ 165(a)(2), (6).

<sup>390</sup> CAA § 173(a)(5).

<sup>391</sup> See generally Foote, *supra* note 344.

<sup>392</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,449-500, n.266.

<sup>393</sup> CAA § 111(b)(1)(B).

<sup>394</sup> CAA § 111(b)(1)(A) (emphasis added).

<sup>395</sup> There is no clear guidance on meaning of “significant” from either courts or legislative history. The original House bill had used the word “substantially,” but the intended distinction, if any, is unclear. H.R. REP. No. 91-1146, at 35 (1970).

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<sup>396</sup> Standards of Performance for New Stationary Sources, 40 C.F.R. pt. 60 (2008).

<sup>397</sup> CAA § 111(b)(1)(B).

<sup>398</sup> See Standards of Performance for Petroleum Refineries, 73 Fed. Reg. 35838, 35859 (June 24, 2008) (to be codified at 40 C.F.R. pt. 60) (giving importance to the phrase “such standards” and to the removal of the word “any” from the definition of “standards of performance”). For a refutation of EPA’s legislative history, see Comments from Clean Air Task Force, to EPA, “Comments on Proposed Amendments to the Current Standards of Performance for Portland Cement Plants,” (Sept. 30, 2008), *available at* <http://www.regulations.gov> (document ID EPA-HQ-OAR-2007-0877-0065.1).

<sup>399</sup> See 73 Fed. Reg. at 35,858 (focusing on the phrases “deems appropriate” and “if appropriate”).

<sup>400</sup> See *id.* at 35,859.

<sup>401</sup> CAA § 111(f)(2)(B).

<sup>402</sup> Congress also hoped that Section 111(g) would help “compel the Administrator to issue new source performance standards...for unregulated hazardous pollutants.” H. REP. NO. 95-564 (conf. report) (1990).

<sup>403</sup> Congress intended that standards of performance should “prevent the occurrence . . . of significant *new* air pollution problems.” *Nat’l Asphalt Pavement Ass’n v. Train*, 539 F.2d 775, 783 (D.C. Cir. 1976) (quoting H.R. REP. NO. 91-1146, at 3 (1970)) (emphasis added).

<sup>404</sup> Congress knew how to address the revision of only existing standards when it wanted to. See CAA § 111(g)(4) (referring to revision, upon state petition, of “the new source standard of performance in effect under this section for such category”).

<sup>405</sup> See *Nat’l Assoc. of Clean Air Agencies v. EPA*, 489 F.3d 1221 (D.C. Cir. 2007).

<sup>406</sup> *Env’tl. Def. v. Duke Energy Corp.*, 549 U.S. 561 (2007).

<sup>407</sup> See, e.g., CAA § 111(g) (allowing states to petition and show that “a new, innovative, or improved technology or process which achieves greater continuous emission reduction has been adequately demonstrated”).

<sup>408</sup> H.R. REP. NO. 95-564 (conf. report) (1977).

<sup>409</sup> In particular, the House put forward the amendment in response to a recommendation from the National Academy of Sciences that standards “be constantly reviewed in light of the new information regarding...techniques of control.” H.R. REP. NO. 95-294 (1977) (also noting “the need to require periodic review and revision of new source standards of performance on a prospective basis”).

<sup>410</sup> H.R. REP. NO. 101-490 pt. 1 (H. Comm. on Energy and Commerce) (1990) (explaining the amendment was “to extend the *timeframes* for developing proposed and final regulations establishing NSPS. The *schedules* for completion of the NSPS for source categories that EPA has already listed for regulation, and *for revision* of existing NSPS are updated and extended. The Administrator is authorized to waive review of a standard if review is not necessary in light of readily available information.”) (emphasis added). Note that the House Committee used the terms “appropriate” and “necessary” interchangeably. See also *Environmental Defense Fund v. Thomas*, 870 F.2d 892, 897 (2d Cir. 1989) (“revision provisions that do include stated deadlines should, as a rule, be construed as creating non-discretionary duties”).

<sup>411</sup> See *Massachusetts v. EPA*, 415 F.3d 50, 68 (J. Tatel, dissenting) (discussing a possible NAAQS exemption based on unworkability, not refusing to extend that argument to exempt GHGs from Section 202).

<sup>412</sup> See CAA § 111(b)(1)(B).

<sup>413</sup> For example, nitric acid plants were last reviewed in 1984. Standards of Performance for Nitric Acid Plants, 40 C.F.R. § 60.72 (2008) (citing last revision in 1975); Complaint at 2, *Env’tl. Integrity Project v. EPA*, *supra* note 168 (noting the rule was last reviewed (though not revised) in 1984).

<sup>414</sup> CAA § 111(d) (emphasis added).

<sup>415</sup> A literal interpretation of the House language—“or emitted from a source category which is regulated under section 112”—would mean that any pollutant emitted by a source regulated under Section 112 cannot be regulated under Section 111(d), whether or not the pollutant itself is regulated under Section 112. By contrast, a literal reading of the Senate language—“or [included on a list published under] section 112(b)” —would only restrict using Section 111(d) to regulate those hazardous air pollutants listed under Section 112.

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<sup>416</sup> See Revision of December 2000 Regulatory Finding on the Emission of Hazardous Air Pollutants from Electric Utility Steam Generating Units and the Removal of Coal- and Oil-Fired Electric Utility Steam Generating Units from the Section 112(c) List, 70 Fed. Reg. 15994, 16032 (Mar. 29, 2005) (to be codified at 40 C.F.R. pt. 63). This Report does not recommend any one interpretation because it does not address the implications for other hazardous air pollutants and area sources.

<sup>417</sup> *Id.* at 16032. Note that this rule was struck down on other grounds in *New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008).

<sup>418</sup> CAA § 111(b)(1)(B) (“The Administrator shall afford interested persons an opportunity for written comment on such proposed regulations. After considering such comments, he shall promulgate, within one year after such publication, such standards with such modifications as he deems appropriate.”).

<sup>419</sup> See, e.g., Comments from the Attorneys General of the States of California, Delaware, New York, Oregon, Vermont, and Washington, and the Commonwealth of Massachusetts, to EPA, Comments on Proposed Rule (Sept. 30, 2008), available at [http://ag.ca.gov/globalwarming/pdf/Portland\\_cement.pdf](http://ag.ca.gov/globalwarming/pdf/Portland_cement.pdf) (commenting on the proposed standards of performance for Portland cement plants, specifically on the lack of standards for GHG emissions).

<sup>420</sup> CAA § 111(b)(1)(B) (“he shall promulgate, within one year after such publication, such standards with such modifications as he deems appropriate”).

<sup>421</sup> Cement plant standards were proposed June 19, 2008. Standards of Performance for Portland Cement Plants, 73 Fed. Reg. 34072 (to be codified at 40 C.F.R. pts. 60 and 63).

<sup>422</sup> See *New York v. EPA*, No. 06-1322, (D.C. Cir. filed Sept. 24, 2007).

<sup>423</sup> See Comments by Attorneys General of the States of California and Oregon, the Commonwealth of Massachusetts, and the Corporation Counsel for the City of New York, to EPA, (June 25, 2008), available at [http://ag.ca.gov/globalwarming/pdf/steam\\_generating\\_units.pdf](http://ag.ca.gov/globalwarming/pdf/steam_generating_units.pdf) (Comments on Docket EPA-HQ-OAR-2005-0031).

<sup>424</sup> See *supra* note 413.

<sup>425</sup> CAA § 111(b)(1)(B).

<sup>426</sup> *Id.* EPA notes that when performance standards are administered by the states (for example, under Section 111(d) for existing sources), typically three years are provided for sources to comply with the standards. EPA 2008 ANPR, 73 Fed. Reg. at 44,367.

<sup>427</sup> S. REP. NO. 101-228, at 127-28 (1989).

<sup>428</sup> For an overview of the regulatory requirements under Section 112, see Daniel Brian, *Regulating Carbon Dioxide Under the Clean Air Act as a Hazardous Air Pollutant*, 33 COLUM. J. ENVTL. L. 369 (2008).

<sup>429</sup> Carbon dioxide would have direct health effect if concentrations reached 2%, but currently concentrations are only 0.038%, and the highest projections for concentrations in the year 2100 are only for 0.098%. Similarly, nitrous oxide has health effects at 25 parts per million, but currently concentrations only reach 0.32ppm. EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT ANALYSIS FOR GHG EMISSIONS UNDER THE CAA 16 (6th draft, June 21, 2008).

<sup>430</sup> See CAA § 112(a)(7) (“The term “adverse environmental effect” means any significant and widespread adverse effect, which may reasonably be anticipated, to wildlife, aquatic life, or other natural resources, including adverse impacts on populations of endangered or threatened species or significant degradation of environmental quality over broad areas.”). Climate change is probably the kind of “significant and widespread” effect that Congress had in mind. Moreover, carbon dioxide could also qualify due to its effects on the pH of water. When carbon dioxide is deposited into the oceans, the resulting acidification threatens marine species, including endangered corals. See Brian, *supra* note 428.

<sup>431</sup> Before the 1990 Amendments, the language of Section 112 was interpreted as mandatory in *NRDC v. Thomas*, 689 F. Supp. 246 (S.D.N.Y. 1988); but cf. *id.* at 255 (“Questions relating to the statute’s definition of a hazardous air pollutant, including whether the danger posed by the pollutant must be ‘significant,’ go to the very heart of the Administrator’s discretionary powers provided for under § 112(a)(1).”). However, the 1990 Amendments to Section 112 were significant: instead of leaving all listing up to EPA, now Section 112

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included a long list of hazardous pollutants and allowed EPA to add more. *Compare* CAA of 1977 § 112 with CAA § 112.

<sup>432</sup> Clean Air Act Amendments of 1989, H.R. 3030, 101st Cong. § 112 (1989); *see* H. REP. NO. 101-490, pt. 1 (H. Comm. On Energy and Commerce), at 326 (1990) (“The Administrator may add a pollutant to the list, on the basis of whether the Administrator determines, in his judgment, that the substance is an air pollutant and that there is sufficient evidence to establish that the pollutant is known to cause or can reasonably be anticipated to cause . . .”).

<sup>433</sup> Clean Air Restoration and Standards Attainment Act of 1989, S. 1630, 101st Cong. § 112 (1989).

<sup>434</sup> S. REP. 101-228, at 147, 160 (1990).

<sup>435</sup> One of the most in-depth scholarly reviews of the application of Section 112 to carbon dioxide treats the decision to list as optional. *See* Brian, *supra* note 428, at 393 (“can be added”). *But cf.* GOV’T ACCOUNTABILITY OFFICE, GAO-06-669, EPA SHOULD IMPROVE THE MANAGEMENT OF ITS AIR TOXICS PROGRAM 18 (2006), *available at* <http://www.gao.gov/new.items/d06669.pdf> (calling the revision of the Section 112 a “requirement”). It is unclear how the public petition process to add a listing, CAA § 112(b)(3), fits into the mandatory or discretionary nature of the process. Also note that in 1987, the Senate might have had a partially more mandatory procedure in mind. *See* S. REP. NO. 100-231, at 229 (1987) (“It is also to be noted that [the Agency for Toxic Substances and Disease Registry] will be naming additional pollutants to its CERCLA section 104(i) list and that the Administrator may add substances to the SARA section 313 list. *Where these pollutants or substances are clearly potential air pollutants...the Administrator shall promptly add such pollutants or substances to the list established here.*”) (emphasis added).

<sup>436</sup> CAA § 112(b)(2) (“No air pollutant which is listed under section 108(a) may be added to the list under this section, except that the prohibition of this sentence shall not apply to any pollutant which independently meets the listing criteria of this paragraph and is a precursor to a pollutant which is listed under section 108(a) or to any pollutant which is in a class of pollutants listed under such section. No substance, practice, process or activity regulated under title VI of this Act shall be subject to regulation under this section solely due to its adverse effects on the environment.”).

<sup>437</sup> H.R. Rep. 101-490, at 341 (1990).

<sup>438</sup> *Sierra Club v. Johnson*, 436 F.3d 1269, 1272 (11th Cir. 2006).

<sup>439</sup> Title V establishes a framework, often referred to as cooperative federalism, under which Congress required EPA to establish the “minimum elements” for permits, which are codified in EPA regulations. State and local permitting authorities are then charged with issuing permits consistent with state programs approved by EPA. CAA, § 502(d)(1); 40 C.F.R. §§ 70.1-70.11. Sometimes EPA issues these permits when a State or local title V permitting program does not exist, for example for sources on Native American reservations. 40 C.F.R. §§ 71.1-71.27.

<sup>440</sup> § 504. In addition to the permit content requirements, there are procedural requirements that the permitting authority must follow in issuing Title V permits, including: determining and notifying the applicant that its application is complete; public notice and a 30-day public comment period on the draft permit, as well as the opportunity for a public hearing; notice to EPA and affected states; and preparing and providing to anyone who requests it a statement of the legal and factual basis of the draft permit. The permitting authority must take final action on permit applications within 18 months of receipt. EPA also has 45 days from receipt of a proposed permit to object to its issuance, and citizens have 60 days to petition EPA to object. Permits may also need to be revised or reopened if new requirements come into effect or if the source makes changes that conflict with, or necessitate changes to, the current permit. Permit revisions and reopening follow procedural requirements which vary depending on the nature of the necessary changes to the permit. *See* EPA 2008 ANPR, 73 Fed. Reg. at 44,511

<sup>441</sup> When a source becomes subject to Title V, it must apply for a permit within one year of the date it became subject and that source cannot operate without a permit. CAA § 503(c).

<sup>442</sup> CAA § 302(j) (emphasis added).

<sup>443</sup> *See* 40 C.F.R. pt. 70 (2008).

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<sup>444</sup> Memorandum from Lydia N. Wegman, EPA Office of Air Quality Planning and Standards, to EPA Air Division Directors, Definition of Regulated Air Pollutant for Purposes of Title V, 4 (1993).

<sup>445</sup> H.R. Rep. No. 101-490, pt I (1990). *But cf.* S. Rep. No. 101-228, at 350 (1989) (proposing language that was not enacted, but interpreting Section 302(j) as being limited to “regulated pollutants”).

<sup>446</sup> CAA § 502(a).

<sup>447</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,511.

<sup>448</sup> State rules differ with regard to which facilities must report and which GHGs must be reported. Some States require all facilities that must obtain Title V permits to report GHG emissions. Others require reporting for particular sectors (e.g., large EGUs, cement plants, refineries). Some State rules apply to any facility with stationary combustion sources that emit a threshold level of CO<sub>2</sub>. Some apply to any facility, or to facilities within listed industries, if their emissions exceed a specified threshold level of CO<sub>2</sub>e. Many of the State rules apply to six GHGs; others apply only to CO<sub>2</sub> or a subset of the six gases. Most require reporting at the facility level, or by unit or process within a facility. EPA, Proposed GHG Monitoring Rule, 74 Fed. Reg. at 16460.

<sup>449</sup> *See* S. REP. 101-228 (1989).

<sup>450</sup> Title VI also requires EPA to list the global warming potentials for such pollutants. CAA § 602(e); Global Warming Potentials (Mass Basis), Referenced to the Absolute GWP for the Adopted Carbon Cycle Model CO<sub>2</sub> Decay Response and Future CO<sub>2</sub> Atmospheric Concentrations Held Constant at Current Levels, 40 C.F.R. pt. 82 Appendix I (2008) (listing global warming potentials as high as 13,600 times that of carbon dioxide).

<sup>451</sup> *See* Substitutes Subject to Use Restrictions and Unacceptable Substitutes, 40 C.F.R. pt. 82 Appendices (2008).

<sup>452</sup> The Conference Committee Report offer little detail on the final language of Title VI, which represented a significant change from the Senate’s original proposal. However, it is notable that the Senate’s much more deferential language for Section 615 (“The Administrator is authorized to prescribe such regulations as *may* be necessary . . .”) was not adopted. *See* H. REP. NO. 101-952 (conf. report) (1990). In Section 615, the Senate intended “to preserve the authority and responsibility of the Administrator as set forth in section 157 of the existing Clean Air Act.” S. REP. NO. 101-228 (1989). When the House drafted that section in 1977, some of the language used seemed to indicate a discretionary duty (“The committee authorizes the initiation of such rulemaking if, in the Administrator’s judgment . . .”). H. REP. NO. 95-294 (1977). However, ultimately Section 157 of the 1977 Act also contained the word “shall.” CAA of 1977 § 157. On the other hand, the Senate only accepted the House’s language in 1977 after adding a provision to clarify that “the regulatory authority granted under this provision is designed only to fill regulatory gaps and not to supersede any existing authority.” H. REP. NO. 95-564 (conf. report) (1977).

<sup>453</sup> H. REP. NO. 95-294 (1977) (discussing Section 157, the precursor to Section 615). *But cf.* S. REP. NO. 101-228 (1989) (originally drafting Title VI to specifically target greenhouse gas emissions, language which did not end up in the final text of the legislation).

<sup>454</sup> H. Rep. No. 95-294 (1977) (noting that the committee did not want to “revise or make more stringent the degree of proof which the Administrator must find to promulgate a regulation”).

<sup>455</sup> 136 Cong. Rec. S16950 (daily ed. Oct. 26, 1990) (Chafee-Baucus Statement of Senate Managers).

<sup>456</sup> *See* CHRISTIAN JARDINE ET AL., ENVIRONMENTAL CHANGE INSTITUTE, METHANE UK 19-21 (2004), available at [www.eci.ox.ac.uk/research/energy/downloads/methaneuk/chapter02.pdf](http://www.eci.ox.ac.uk/research/energy/downloads/methaneuk/chapter02.pdf).

<sup>457</sup> *See* 136 Cong. Rec. S16950 (daily ed. Oct. 26, 1990) (Chafee-Baucus Statement of Senate Managers) (“Effects such as anthropogenically induced cooling of the stratosphere are included and must be considered by the Administrator. Cooling of the stratosphere has important implications for global climate change.”).

<sup>458</sup> *See e.g.*, S. Brand et al., *Tropospheric Circulation Sensitivity to an Interactive Stratospheric Ozone*, GEOPHYSICAL RESEARCH LETTERS, available at <http://epic.awi.de/Publications/Bra2008c.pdf>.

<sup>459</sup> IPCC 2007 Report, *supra* note 2 (also noting a potential cooling effect).

<sup>460</sup> Though once a finding is made, EPA must then regulate “promptly.” CAA § 615.

<sup>461</sup> CAA § 617(a) (emphasis added).



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<sup>462</sup> See 136 Cong. Rec. S16950 (daily ed. Oct. 26, 1990) (Chafee-Baucus Statement of Senate Managers) (“The Senate provision regarding international agreements is included in the conference agreement. As a result, United States’ delegations to future meetings of the parties to the Montreal Protocol have a *legal obligation* to seek modifications to the Protocol that will make the requirements of the Protocol at least as stringent as the requirements applicable in the United States as a result of this legislation.”) (emphasis added).

<sup>463</sup> *Hearing on the Nomination of Lisa P. Jackson to be Administrator of the U.S. Environmental Protection Agency: Before the S. Comm. on Environment and Public Works*, 111th Cong. (testimony of Lisa Jackson).

<sup>464</sup> See Cass R. Sunstein, *Is OSHA Unconstitutional?* (Univ. of Chi., Pub. L. Working Paper No. 209) (2008).

<sup>465</sup> See Appendix.

<sup>466</sup> See, e.g., Robert R. Nordhaus, *New Wine Into Old Bottles: The Feasibility of Greenhouse Gas Regulation Under the Clean Air Act*, 15 N.Y.U. ENVTL. L.J. 53, 56 (2007).

<sup>467</sup> See H.R. Rep. No. 95-1175 (1976) (noting that the CAA of 1970 relied almost exclusively on command-and-control).

<sup>468</sup> Nordhaus, *supra* note 466 (quoting Robert N. Stavins, *Policy Instruments for Climate Change: How Can National Governments Address a Global Problem?* 1997 U. CHI. LEGAL F. 298, 297-98).

<sup>469</sup> Many economists and policy analysts would prefer an emissions tax or “carbon tax.” See JONATHAN L. RAMSEUR & LARRY PARKER, CONG. RESEARCH SERV., NO. R40242, CARBON TAX AND GREENHOUSE GAS CONTROL: OPTIONS AND CONSIDERATIONS FOR CONGRESS (2009). Such a system would levy fees on the producers, distributors, or users of fossil fuels based on anticipated greenhouse gas emissions. The tax incentivizes the adoption of cost-effective emissions controls and makes alternative energy technologies more cost-competitive with cheaper polluting fuels. However, unlike a cap-and-trade program, a carbon tax would not set a precise limit on total emissions: producers, distributors, and users could emit as much GHGs as they desired as long as they paid for it.

While a few legislators favor a tax instead of cap-and-trade legislation, traditionally it is hard to move new tax proposals through the political process. See Robin Bravender, *Inglis Pushes Carbon Tax Plan in Lieu of Cap and Trade*, E&E DAILY NEWS, Mar. 19, 2009. Because most of the proposals currently under consideration would implement a cap-and-trade system, this Report will mainly focus on the effects of EPA regulations under the CAA with a cap-and-trade system, not a carbon tax system.

<sup>470</sup> See Peter D. Cameron, *The Kyoto Process: Past, Present, and Future*, in KYOTO: FROM PRINCIPLES TO PRACTICE 3, 10 (Peter D. Cameron & Donald Zillman eds., 2001) (discussing the flexible trading mechanisms built into the Kyoto Protocol).

<sup>471</sup> See Exec. Order No. 12,866 § 6, 58 Fed. Reg. 51,735 (1993).

<sup>472</sup> See *Whitman v. Am. Trucking Ass’n*, 531 U.S. 457 (2001).

<sup>473</sup> See, e.g., CAA §§ 111, 202.

<sup>474</sup> OMB, A NEW ERA OF RESPONSIBILITY RENEWING AMERICA’S PROMISE, *supra* note 23, at 21 (proposing an emission target 14% reductions by 2020 and 83% by 2050).

<sup>475</sup> See Interview by Monica Trauzzi, Managing Editor, E&E TV, with Senator Jeff Bingaman (Mar. 3, 2009).

<sup>476</sup> See PEW CTR. ON GLOBAL CLIMATE CHANGE, CONGRESSIONAL POLICY BRIEF: SCOPE OF A GREENHOUSE GAS CAP-AND-TRADE PROGRAM 8 (2008).

<sup>477</sup> See Darren Samuelsohn, *House Dems Eye Trade Sanctions, Free Allowances for Manufacturers*, E&E DAILY NEWS, Mar. 18, 2009.

<sup>478</sup> *Policy Options to Prevent Climate Change: Hearing Before H. Comm. on Ways and Means*, 100th Cong., 8 (2008) (testimony of Dallas Burtraw, Senior Fellow, Resources for the Future). Economic experts and President Obama are calling for a 100% auction of all allowances, decrying any free allocation of permits as an industry giveaway. See Robin Bravender, *Economists Assail Industry’s Push for Free Allowances*, E&E DAILY NEWS, Apr. 9, 2009. But see Ben Geman & Mike Burnham, *Obama Admin. Courting Moderate Senate Democrats*, E&E DAILY NEWS, Apr. 8, 2009 (noting Obama may be flexible on his call for a 100% auction).

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<sup>479</sup> Rob Inglis, *The Power Industry's Prisoner's Dilemma*, THE NEW REPUBLIC: THE VINE, Mar. 23, 2009, available at <http://blogs.tnr.com/tnr/blogs/environmentandenergy/archive/2009/03/23/the-power-industry-prisoner-s-dilemma.aspx>.

<sup>480</sup> See *Protecting Lower-Income Families While Fighting Global Warming: Hearing Before H. Subcomm. on Income Security and Family Support*, 111th Cong. (2009) (statement of Terry M. Dinan, Senior Advisor, Congressional Budget Office).

<sup>481</sup> See Dallas Burtraw et al., *The Incidence of U.S. Climate Policy: Where You Stand Depends on Where You Sit* 36 (Res. for the Future Discussion Paper No. 08-28, 2008), available at <http://www.rff.org/RFF/Documents/RFF-DP-08-28.pdf>. This is true even before they change their behavior to save energy, which for lower-income Americans might not be financially feasible right away. The regional disparities from a cap with revenue distribution are also not large. *Id.*

<sup>482</sup> OMB, A NEW ERA OF RESPONSIBILITY, *supra* note 23, at 21. The President's budget proposed that, of the auction proceeds from a cap-and-trade system for GHGs, \$150 billion would be used to fund clean energy technologies, and the balance would be "returned to the people, especially vulnerable families, communities, and businesses to help the transition to a clean energy economy." *Id.*

<sup>483</sup> *But cf. Strengths and Weaknesses of Regulating Greenhouse Gas Emissions Using Existing Clean Air Act Authorities: Hearing Before H. Comm. on Energy & Commerce*, 110th Cong., 8 (Apr. 20, 2008) (statement of Lisa Heinzerling, Professor of Law).

<sup>484</sup> See, e.g., *Nat'l Cable Television Ass'n v. United States*, 415 U.S. 336, 340 (1974).

<sup>485</sup> U.S. CONST. art. I, § 8.

<sup>486</sup> See Independent Offices Appropriation Act, 31 U.S.C. § 9701 (2008) (authorizing agencies to collect certain regulatory fees); *Nat'l Cable*, 415 U.S. at 343. *But cf. Clean Air Act Amendments of 1989: Hearing Before the Subcomm. on Env'tl. Pollution of the S. Comm. on Environment and Public Works*, 101st Cong. (Apr. 18, 1989) (statement of Richard Hembra, director of the General Accounting Office) (noting that the authority to create a regulatory fee under a general grant of authority is "murky" and "highly speculative").

<sup>487</sup> See *Thomas v. Network Solutions Inc.*, 2 F. Supp. 2d 22, 29 (D.D.C. 1998).

<sup>488</sup> See *id.* at 35-36 ("[A] contract is not involuntary because it flows from a monopoly, even if the government (or its agent) holds that monopoly, as long as the monopolist is merely servicing an existing need, and has not created the need itself. . . . [In this case, t]here is no arbitrary need for NSI's services; NSI does not provide a government-mandated license, for example."); see also H.R. Rep. No. 101-490, pt. 2 (H. Comm. on Ways and Means) (1990) ("The [emissions] fees described are in the nature of taxes because they are not designed solely to compensate the Federal Government . . . and the fees are designed to modify the behavior. . . . In addition, these fees are in the nature of taxes because the fees are assessed with respect to behavior that is not voluntary in nature. Businesses wishing to continue to operate must pay these fees.").

<sup>489</sup> Therefore, the auction will not be constrained by the limitations of the Independent Offices Appropriation Act, 31 U.S.C. § 9701. *Cf. Nat'l Cable*, 415 U.S. at 343.

<sup>490</sup> See *San Juan Cellular Telephone Co. v. Public Serv. Comm'n of Puerto Rico*, 967 F.2d 683, 685 (1st Cir. 1992) (citing *South Carolina ex rel. Tindal v. Block*, 717 F.2d 874, 887 (4th Cir. 1983), *cert. denied*, 465 U.S. 1080, (1984)).

<sup>491</sup> See Memorandum from Douglas Kmiec, Asst. Attorney General, Office of Legal Counsel, to Alan Raul, General Counsel, White House Office of Management and Budget (May 15, 1989) (discussing constitutionality of implicit authority for an auction, including the non-delegation doctrine).

<sup>492</sup> Also note that before the 1990 Amendments, Section 120 of the Act provided for the imposition of a non-compliance penalty on certain stationary sources, and the penalty was based on the economic value to the source of its non-compliance. See CAA of 1977 § 120.

<sup>493</sup> See H.R. Rep. No. 101-490, pt. 2 (H. Comm. on Ways and Means) (1990) (worrying that allowing EPA to impose "fees" would create undesirable "taxes").

<sup>494</sup> See also CAA Appendix § 407 (expressing the sense of Congress that the 1990 amendments, through the creation of Title IV, "allocates the costs of achieving the required reductions in emissions of sulfur dioxide and

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oxides of nitrogen. . . . Broad based taxes and emission fees that would provide for payment of the costs of achieving required emission reductions by any [other] party . . . are undesirable”).

<sup>495</sup> See CAA of 1977 § 405.

<sup>496</sup> H.R. Rep. No. 95-1175 (1976). The goal of Section 405, as explained by its chief sponsor Representative Wirth, was to gather “enough evidence to adopt a comprehensive program of economic controls, a program that imposes less of a burden . . . and that is more effective than our current approach.” 122 Cong. Rec. H9632 (daily ed. Sept. 9, 1976) (statement of Rep. Wirth).

<sup>497</sup> See CAA of 1970 §§ 111, 202.

<sup>498</sup> For example, in *Shook v. District of Columbia Fin. Responsibility and Management Assistance Auth.*, 132 F.3d 775, 782 (D.C. Cir. 1998), the D.C. Circuit stated:

We have recognized, however, that [] maxim [of *expressio unius est exclusio alterius* (the mention of one thing implies the exclusion of another)] is often misused. Sometimes Congress drafts statutory provisions that appear preclusive of other unmentioned possibilities—just as it sometimes drafts provisions that appear duplicative of others—simply, in Macbeth's words, “to make assurance double sure.” That is, Congress means to clarify what might be doubtful—that the mentioned item is covered—without meaning to exclude the unmentioned ones. The maxim's force in particular situations depends entirely on context, whether or not the draftsmen's mention of one thing, like a grant of authority, does really necessarily, or at least reasonably, imply the preclusion of alternatives. That will turn on whether, looking at the structure of the statute and perhaps its legislative history, one can be confident that a normal draftsman when he expressed “the one thing” would have likely considered the alternatives that are arguably precluded. For that reason, we think the maxim should be used as a starting point in statutory construction—not as a close-out bid.

<sup>499</sup> Memorandum from Douglas Kmiec, *supra* note 491.

<sup>500</sup> See 136 Cong. Rec. H12845 (daily ed. Oct. 26, 1990) (statement of Rep. Anderson, chair of the H. Comm. on Transportation and Infrastructure, regarding the Conference Report) (“The conferees also adopted the Senate version of Section 108(f), with some modifications. Among the modifications, the reference to road charges, tolls, parking surcharges, and other pricing mechanisms was deleted from (1)(A)(vii). *These economic strategies were deleted from this clause of Section 108(f) in order to avoid the implication that such strategies were available only in downtown areas, or other areas of emission concentration, or during periods of peak use. Section 172 (c) of the bill establishes the general requirements for implementation plans in non-attainment areas. The general plan provisions include the use of economic incentives, such as fees, marketable permits, and auctions of emission rights . . . . The limited context for the use of such strategies suggested by Section 108(f)(1)(A)(vii) was potentially inconsistent with the general provision of the bill and was therefore removed.*”) (emphasis added).

<sup>501</sup> See H.R. Rep. No. 101-490, pt. 2 (H. Comm. on Ways and Means) (1990) (objecting to the inclusion of emissions fees in FIPs and various other provisions, because: “The [emissions] fees described are in the nature of taxes because they are not designed solely to compensate the Federal Government . . . and the fees are designed to modify the behavior. . . . In addition, these fees are in the nature of taxes because the fees are assessed with respect to behavior that is not voluntary in nature. Businesses wishing to continue to operate must pay these fees.”). Note, however, that the specific attempt in the House of Representatives to strip the word “fee” failed by a vote of 170-253. 136 Cong. Rec. H2511 (daily ed. May 21, 1990) (Roll Call No. 131). The language was removed subsequently by the Senate, at the behest of the White House.

<sup>502</sup> Memorandum from Douglas Kmiec, *supra* note 491.

<sup>503</sup> *Clean Air Act Amendments of 1989: Hearing Before the Subcomm. on Envtl. Pollution of the S. Comm. on Environment and Public Works*, 101st Cong. (Apr. 18, 1989) (statement of Richard Hembra, director of the General Accounting Office).

<sup>504</sup> Indeed, court cases reviewing existing EPA trading programs set up under various sections (110(d), 111, 615) have never mentioned a negative inference. And while some of EPA's previous attempts to establish trading programs have been struck down by courts on unrelated grounds, it is clear EPA has historically not interpreted the CAA as creating a negative inference against trading. For example, EPA's entire mercury trading rule was invalidated by the D.C. Circuit due to EPA's failure to follow the proper procedures in

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delisting mercury as a hazardous air pollutant under section 112 of the Act. *New Jersey v. EPA*, 2008 U.S. App. LEXIS 2797 (2008). The court did not decide whether EPA had lawfully interpreted section 111(d) to permit the creation of a cap-and-trade scheme for existing electricity generating units. *Id.*

<sup>505</sup> Nor could EPA avoid this result by distributing allowances to some non-profit third party that would run the auction and distribute revenue. “Government agencies cannot escape responsibility for failing to perform their statutory duties by hiring private parties to perform those duties.” *Thomas*, 176 F.3d at 510.

<sup>506</sup> See Miscellaneous Receipts Act, 31 U.S.C. § 3302 (2008).

<sup>507</sup> See IOAA, 31 U.S.C. § 9701(a) (“It is the sense of Congress that each service or thing of value provided by an agency (except a mixed-ownership Government corporation) to a person (except a person on official business of the United States Government) is to be self-sustaining to the extent possible.”). It is less clear whether EPA could keep enough to cover all its expenses relating to climate change regulation.

<sup>508</sup> RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW §102(3) (1987).

<sup>509</sup> Vienna Convention on the Law of Treaties, *done* May 23, 1969, art. 46.1, 1155 U.N.T.S. 331.

<sup>510</sup> *Id.* at Art. 7.2(a)

<sup>511</sup> 11 FOREIGN AFFAIRS MANUAL 723.2-2 (2006).

<sup>512</sup> U.S. CONST., art. III § 2.

<sup>513</sup> See John C. Yoo, *Law as Treaties?: The Constitutionality of Congressional-Executive Agreement*, 99 MICH. INT’L L. REV. 757 (2007).

<sup>514</sup> See *id.*; Michael D. Ramsey, *Executive Agreements and the Non(Treaty) Power*, 77 N.C. L. REV. 133 (1998) (explaining the contours of the President’s power to undertake international obligations through non-treaty executive agreements).

<sup>515</sup> 11 FOREIGN AFFAIRS MANUAL 723.2-2(B) (2006).

<sup>516</sup> 11 FOREIGN AFFAIRS MANUAL 723.2-2(c) (2006).

<sup>517</sup> See Yoo, *supra* note 513.

<sup>518</sup> RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW §115 n.5

<sup>519</sup> S. REP. 101-228, at 400 (1990) (“This section is intended, in addition to fostering implementation of new requirements set forth in this title, to preserve the authority and responsibility of the Administrator as set forth in section 157 of the existing Clean Air Act.”).

<sup>520</sup> H.R. Rep. No. 101-294 (1977).

<sup>521</sup> *Id.*

<sup>522</sup> Protection of Stratospheric Ozone, 53 Fed. Reg. 30566 (Aug. 12, 1988) (codified at 40 C.F.R. pt. 82).

<sup>523</sup> Memorandum from Douglas Kmiec, *supra* note 491 (“It is thus clear that Congress was cognizant of economic forms of regulation, did not prohibit them, but instead used general language permitting a wide scope of regulatory measures for the control of CFCs.”).

<sup>524</sup> *Proposals to Control the Manufacture, Use, and Disposals of Ozone-Depleting Substances: Hearing Before the Subcomm. On Env’tl. Pollution of the S. Comm. On Env’t and Pub. Works*, 101st Cong. (May 19, 1989).

<sup>525</sup> Starting with Section 615’s predecessor, Section 157(b), Congress specifically intended the phrase “affect the stratosphere” to include “certain chemical reactions in the stratosphere [that] may result in potentially serious climatic change without depleting ozone.” H.R. Rep. No. 95-294 (1977) (discussing Section 157, the precursor to Section 615). *But cf.* S. Rep. No. 101-228 (originally drafting Title VI to specifically target greenhouse gas emissions, language which did not end up in the final text of the legislation).

<sup>526</sup> 136 Cong. Rec. S16949 (daily ed. Oct. 26, 1990) (Chafee-Baucus Statement of Senate Managers).

<sup>527</sup> H.R. Rep. No. 95-294 (1977).

<sup>528</sup> Section 617 was based on CAA of 1977 § 156.

<sup>529</sup> 136 Cong. Rec. H12908 (daily ed. Oct. 26, 1990) (statement of understanding of Rep. Oxley).

<sup>530</sup> 136 Cong. Rec. S16950 (daily ed. Oct. 26, 1990) (Chafee-Baucus Statement of Senate Managers).

<sup>531</sup> 136 Cong. Rec. S2110 (daily ed. Jan. 23, 1990) (statement of Senator Chafee) (emphasis added).

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<sup>532</sup> *Id.* (emphasis added).

<sup>533</sup> See CAA §§ 615 (“shall submit notice of the proposal and promulgation of such regulations to the Congress”), 617 (“shall report to the Congress periodically”).

<sup>534</sup> See 58 Fed. Reg. 15014, 15039 (Mar. 18, 1993); 58 Fed. Reg. 65018, 65044 (Dec. 10, 1993).

<sup>535</sup> *Union Oil Co. of California v. EPA.*, 821 F.2d 678, 680 (D.C. Cir. 1987).

<sup>536</sup> Provided these fuels emit GHGs upon combustion.

<sup>537</sup> EPA, Regulation of Fuel and Fuel Additives; Gasoline Lead Content; Final rule, 50 Fed. Reg. 9,386 (Mar. 7, 1985); EPA, Regulation of Fuels and Fuel Additives; Banking of Lead Rights; Final rule, 50 Fed. Reg. 13,118 (Apr. 1, 1985); see also *Union Oil Co.*, 821 F.2d at 679. This program was codified at 40 C.F.R. pt. 80, but is no longer in effect.

<sup>538</sup> See *Union Oil Co.*, 821 F.2d at 679-82.

<sup>539</sup> See, e.g., *Union Oil Co.*, 821 F.2d at 681 (“[P]etitioners do not challenge the lead content standards promulgated separately, nor do they challenge the banking scheme as a whole. Rather, they argue only that the state standard limitation on banking unfairly discriminates against California gasoline sellers.”); see also *United States v. Coastal Refining and Marketing, Inc.*, 911 F.2d 1036 (5th Cir. 1990) (upholding fine imposed on regulated entity in violation of the program).

<sup>540</sup> EPA, Control of Air Pollution From New Motor Vehicles: Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements, 65 Fed. Reg. 6,698 (Feb. 10, 2000) (codified at 40 CFR Parts 80, 85, and 86). The Tier 2 Vehicle and Gasoline Sulfur Program, went into effect in January 2004 and affects every new passenger vehicle and every gallon of gasoline sold in the U.S. That program sets increasingly stringent standards on refinery average, corporate pool average, and a per-gallon cap (measured as parts per million) on the sulfur content of gasoline coming out of refineries. So the refinery industry could comply with the rules more cost-effectively, EPA allowed companies to average sulfur levels among different refineries, and also to generate credits by producing gasoline with lower sulfur content than the standard. These credits could then be banked for use at a later time, or traded and used by another company. No allotment or credit can be transferred more than twice. A refiner or importer must use any allotments or credits necessary to meet its sulfur standards before transferring any allotments or credits to another refiner or importer.

<sup>541</sup> H.R. Rep. 95-1175 (1976) (discussing section 211(d) which allows for penalties for violations of regulations under section 211(c).

<sup>542</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,362.

<sup>543</sup> *Id.* at 44,403

<sup>544</sup> 49 U.S.C. § 44714.

<sup>545</sup> EPA must regulate under section (a) before regulating under section(b). If the authority granted in section(a) did not allow FAA to institute a permitting program for aircraft fuel, FAA could simply issuing typical fuel content standards to meet the obligation under that section. As explained in Chapter Six, a command-and-control style low-carbon fuel standard would not impede a cap-and-trade system for vehicle fuel; in fact, it would be desirable because it would target fuel bought internationally and burned by foreign aircraft within U.S. borders.

As another alternative, FAA could exercise its enforcement discretion under the provision and allow regulated parties to satisfy a more traditional command-and-control style regulation of jet fuel composition by voluntarily participating in EPA’s cap-and-trade system.

<sup>546</sup> Nat’l Petrochemical & Refiners Ass’n, United States Refining and Storage Capacity Report (Aug. 2008), available at <http://www.npradc.org/docs/publications/statistics/RC2008.pdf> (“On January 1, 2008, there were 150 operable refineries in the United States (excluding Puerto Rico and the Virgin islands) with total crude distillation capacity of 17.6 million barrels per calendar day and 18.6 million barrels per stream day. Of these, 146 refineries were operating on January 1, 2008, with operating capacity listed at 17.2 million barrels per calendar day and 18.2 million barrels per stream day.”)

<sup>547</sup> For example, the Internal Revenue Service and Departments of Transportation and State, along with the Motor Fuel Industry, administer a tracking system for the federal excise tax on motor fuels and collect monthly information from terminal operators and bulk fuel carriers (pipeline, vessel and barge operators).

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See Internal Revenue Service, Excise Summary Terminal Activity Reporting System, <http://www.irs.gov/businesses/small/article/0,,id=177193,00.html> (last visited Apr. 26, 2009). The Energy Information Administration also collects monthly data on the sales volumes for fifteen different liquid fuels at this point. See Energy Information Administration, Monthly Energy Review, <http://www.eia.doe.gov/emeu/mer/petro.html> (last visited Apr. 26, 2009).

<sup>548</sup> Ocean acidification from carbon dioxide is another major adverse effect of increased greenhouse gases. The potential for air to cause ocean acidification is directly related to carbon dioxide concentrations.

<sup>549</sup> Temperature is related to the balance of incoming and outgoing energy in the earth's atmosphere, also called the "net irradiance." Different chemical components of air have varying capacities for absorbing, transforming, and dispersing solar radiation. EPA—following the lead of the Intergovernmental Panel on Climate Change—considers the contribution to net irradiance of specific pollutants by measuring their "radiative forcing." NAT'L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR OZONE AND RELATED PHOTOCHEMICAL OXIDANTS, *supra* note 9, at 10-44. Radiative forcing is measured in watts per square meter. Calculations of radiative forcing are based on the pollutant's concentration. IPCC, CLIMATE CHANGE 2001: THE SCIENTIFIC BASIS 6.3.5 (2001). The relative impact on climate change of future emissions—as opposed to absolute concentrations—can be measured by using a pollutant's global warming potential, but this is only a relative measurement. "Quality" suggests the more absolute measurements of temperature and radiative forcing. In short, if temperature is the quality, then concentration is the standard.

<sup>550</sup> Of course, concentrations of pollutants are ultimately a product of anthropogenic emissions, along with natural sources and the longevity of the pollutant in the atmosphere. But that relationship does not mean that a greenhouse gas emissions rate can measure the quality of the air. An analogy may prove illustrative. Consider a jar of peanut butter (analogous to a sample of air). If you want to know how unhealthy the peanut butter is (a quality, analogous to radiative forcing), you may want to measure the content of trans fatty acids in that jar (analogous to a greenhouse gas concentration). On the other hand, knowing how many gallons of hydrogenated vegetable oil the manufacturers add each hour to their peanut butter vats (analogous to an emissions rate) is not a satisfactory answer. The speed at which the oil was added cannot measure the quality of the jar of peanut butter. Moreover, setting a standard to reduce that rate will have no effect on the fattiness of the already-produced jar of peanut butter, just as a standard to curtail emissions will not change the radiative forcing of those long-lived greenhouse gases already in the atmosphere.

<sup>551</sup> CAA § 302(k).

<sup>552</sup> For example, Section 109(b)(2) specifies that secondary NAAQS "shall specify a *level* of air quality." While the Act does not define "level," Section 188(d)(2) discusses the "standard level" of the particulate matter NAAQS in the context of an "annual mean *concentration*." Also, the American Heritage Dictionary defines "level" as "a relative degree, as of achievement, intensity, or *concentration*." Similarly, Section 110(a)(5)(D) concerns the potential for emissions from mobile sources to "contribute to air pollution *concentrations* exceeding any national primary ambient air quality standard." Section 163(a) discusses the "maximum allowable increase for a pollutant based on *concentrations permitted under NAAQS* for any period." Section 109(c) provides mixed evidence. That provision requires EPA to set a primary NAAQS for "NO<sub>2</sub> concentrations." If NAAQS always had to be concentrations, Congress could have just directed EPA to set a primary NAAQS for NO<sub>2</sub>. Still, the use of the word "concentration," combined with the other statutory text, does suggest Congress thought NAAQS would usually, if not always, be concentrations.

<sup>553</sup> See Appendix.

<sup>554</sup> Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone, 63 Fed. Reg. 57,356, 57,358 (Oct. 27, 1998) [hereinafter NO<sub>x</sub> SIP Call]

<sup>555</sup> *North Carolina v. EPA*, 531 F.3d 896, 901 (D.C. Cir. 2008) (per curiam) ("more than several fatal flaws in the rule.").

<sup>556</sup> State budgets of emissions credits can be allocated on the basis of how much pollution a state can cost-effectively eliminate. See *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000).

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<sup>557</sup> North Carolina to Reduce Interstate Transport of Fine Particulate Matter and Ozone; Federal Implementation Plans To Reduce Interstate Transport of Fine Particulate Matter and Ozone; Revisions to the Clean Air Interstate Rule; Revisions to the Acid Rain Program, 71 Fed. Reg. 25,328, 25,328 (Apr. 28, 2006).

<sup>558</sup> *North Carolina*, 531 F.3d 896. Granted, trading was not challenged per se in that case. Similarly, *Michigan*, 213 F.3d at 663, also never ruled on the per se lawfulness of the trading program. But *Michigan* did rule that trading was not an unlawful interference with state's right to create its own SIP: "Given the *Train* and *Virginia* precedent, the validity of the NO<sub>x</sub> budget program underlying the SIP call depends in part on whether the program in effect constitutes an EPA-imposed control measure or emission limitation triggering the *Train Virginia* federalism bar: in other words, on whether the program constitutes an impermissible source-specific means rather than a permissible end goal. However, the program's validity also depends on whether EPA's budgets allow the covered states real choice with regard to the control measure options available to them to meet the budget requirements."

<sup>559</sup> *North Carolina*, 531 F.3d at 907 ("Section 110(a)(2)(D)(i)(I) prohibits sources "within the State" from "contribut[ing] significantly to nonattainment in . . . any other State . . ." (emphasis added). Yet under CAIR, sources in Alabama, which contribute to nonattainment of PM<sub>2.5</sub> NAAQS in Davidson County, North Carolina, would not need to reduce their emissions at all.").

<sup>560</sup> *Id.*

<sup>561</sup> The D.C. Circuit also placed additional limitations on the permissible structure of a trading program. For example, actions under Section 110(a)(2)(D) must be "consistent with the provision of this title"—including the statutory deadlines for reaching attainment, which could limit EPA's ability to phase-in the program. *Id.* Should EPA decide not to use Section 110(a)(2)(D) as the basis for a trading program, it can avoid the potential complicated and inefficient requirements of that section rather simply. The section obligates states to ensure that no "source or other type of emissions activity" will "contribute significantly" or interfere with another state's air quality. Given current ambient concentrations of greenhouse gases and the multiple sources of emissions, EPA could easily declare that no single source can contribute "significantly" or interfere with another state's air quality. Even a single large power plant will, on its own, have little effect on the global average greenhouse gas concentrations. This definition of "significantly" will also help EPA avoid potential problems under Section 126, which otherwise would allow any political subdivision (state, city, county, or town) to petition EPA to block construction of any "significant" source in any state.

<sup>562</sup> EPA's 2008 ANPR, 73 Fed. Reg. 44,354.

<sup>563</sup> See *Michigan*, 213 F.3d at 663 ("Though states have 'considerable latitude in fashioning SIPs,' the Clean Air Act generally 'gives EPA the authority to determine a state's compliance with the requirements.'").

<sup>564</sup> See *Union Electric Co. v. EPA*, 427 U.S. 246 (1976) (section 110 left to the states "the power to determine which sources would be burdened by regulations and to what extent."); *EPA v. Brown*, 431 U.S. 99, 103 (1977) (per curiam) (section 110 did not permit the agency to require the state to pass legislation or issue regulations containing control measures of EPA's choosing); *Florida Power & Light Co. v. Costle*, 650 F.2d 579 (5th Cir. 1981)

<sup>565</sup> *Virginia v. EPA*, 108 F.3d 1397 (D.C. Cir. 1997) (EPA allowed states to develop a "substitute program," but defined the criteria in such a way that it was not a real alternative); *Florida Power*, 650 F.2d at 587-89 (EPA's attempt to require Florida to include a particular provision in its State Plan was "clearly an abuse of discretion; it is agency action beyond the Congressional mandate," action that would "usurp state initiative in the environmental realm" and "disrupt the balance of state and federal responsibilities that undergird the efficacy of the Clean Air Act.").

<sup>566</sup> *Train v. NRDC*, 421 U.S. 60 (1975) ("The Act gives the Agency no authority to question the wisdom of a State's choices of emission limitations if they are part of a plan which satisfies the standards of § 110(a)(2), and the Agency may devise and promulgate a specific plan of its own only if a State fails to submit an implementation plan which satisfies those standards. § 110(c). Thus, so long as the ultimate effect of a State's choice of emission limitations is compliance with the national standards for ambient air, the State is at liberty to adopt whatever mix of emission limitations it deems best suited to its particular situation."). *Virginia*, 108 F.3d 1397 (finding that subsequent amendments to the act did not change the holding of *Train*, "Neither of

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these differences, however, amounts to a new grant of authority to EPA to require states to insert in their plans control measures EPA has selected”).

<sup>567</sup> *Id.* (quoting Section 107(a)). EPA “identifies the end to be achieved, while the states choose the particular means for realizing that end.” *Air Pollution Control Dist. v. EPA*, 739 F.2d 1071, 1075 (6th Cir. 1984).

<sup>568</sup> *Michigan*, 213 F.3d 663.

<sup>569</sup> EPA definitely has “recei[ved] reports, surveys, [and] studies from [a] duly constituted international agency . . . that [an] air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country”—namely, IPCC reports on the global dangers presented by anthropogenic greenhouse gas emissions, of which the United States is a significant contributor. See IPCC 2007 Report, *supra* note 2; see *New York v. Thomas*, 613 F. Supp. 1472 (D.D.C. 1985), *rev’d*, 802 F.2d 1443 (D.C. Cir. 1986) (discussing the meaning of “duly constituted international agency”). The courts recognize that EPA has “a degree of discretion” when making such an endangerment finding, *Her Majesty the Queen in Right of Ontario v. EPA* 912 F.2d 1525 (D.C. Cir. 1990), but EPA cannot ignore the standards of reasonableness.

Section 115 only applies “to a foreign country which the Administrator determines has given the United States essentially the same rights with respect to the prevention or control of air pollution occurring in that country.” The United States and 191 other countries have signed the United Nations Framework Convention on Climate Change. See UNFCCC, Parties to the Convention, [http://unfccc.int/parties\\_and\\_observers/parties/items/2352.php](http://unfccc.int/parties_and_observers/parties/items/2352.php). Though the United States has not signed the Kyoto Protocol, the Framework Convention does contain some commitments. Under that Convention, developed countries, including the United States, all committed to adopt national policies to mitigate climate change by reducing emissions. UNFCCC, art. 4 (May 9, 1992). Developing countries were not required to make such commitments, but they did commit to “[t]ake climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions.” *Id.* art. 4(1)(f). Admittedly, this commitment is much more vague and voluntary than the actions the United States agreed to. But given the “common but differentiated responsibilities” of countries in addressing a problem of “common concern” like climate change, *id.* art. 3, these commitments made by developing countries might be treated as “essentially the same” as the United States’s commitment under the Convention. All parties equally agreed to do what they could to “protect the climate system for the benefit of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibilities and respective capabilities.” *Id.* art. 3(1). Generally, the courts recognize that the concept of reciprocity is fluid, and they grant EPA some discretion in interpreting Section 115. *New York v. Thomas*, 613 F. Supp. 1472 (D.D.C.1985).

If Section 115 is triggered, then states must revise their NAAQS-implementation plans “with respect to so much of the applicable implementation plan as is inadequate to prevent or eliminate the endangerment [to foreign countries.]” CAA § 115. It is not clear whether developed nations that have granted the United States reciprocal rights, like France and Germany, face any unique threats from climate change that the states’ original implementation plans would not have addressed. If they do, or if particular climate-sensitive developing nations have granted reciprocal rights to the United States, then state implementation plans will eventually have to be revised to reflect foreign welfare.

<sup>570</sup> EPA’s 2008 ANPR, 73 Fed. Reg. 44,483, reminds that “Section 115 could not be used to require states to incorporate into their SIPs measures unrelated to attainment or maintenance of a NAAQS.” Participation in a national cap-and-trade program is clearly related to attainment and maintenance of NAAQS for greenhouse gases, because the concentration of greenhouse gases within a state are related to national emissions.

<sup>571</sup> Section 115 may also give EPA supplemental authority to define when SIPs are “adequate.” If a state has adopted its own stringent emissions controls for greenhouse gases, its SIP may be adequate to provide for the implementation and maintenance of NAAQS within its borders, under Section 110(a). However, such a plan may still be inadequate to prevent the foreign endangerment caused by total U.S. emissions, under Section 115. EPA can not specify which control measures would be sufficient, but it can propose its cap-and-trade program as one option.

<sup>572</sup> There are a few exceptions. For example, states cannot regulate aircraft, and certain restrictions apply to state regulations of motor vehicle emissions. However, states can regulate the use of fuel, allowing a more upstream approach to mobile sources. See CAA § 211(c) (“A State may prescribe and enforce, for purposes of



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motor vehicle emission control, a control or prohibition respecting the use of a fuel or fuel additive in a motor vehicle or motor vehicle engine if an applicable implementation plan for such State under section 110 so provides. The Administrator may approve such provision in an implementation plan, or promulgate an implementation plan containing such a provision, only if he finds that the State control or prohibition is necessary to achieve the national primary or secondary ambient air quality standard which the plan implements.”).

<sup>573</sup> Each implementation plan shall “include enforceable emissions limitations and other control measures, means, or techniques (including economic incentives such as fees, marketable permits, and auction of emissions rights)...as may be necessary or appropriate.” Section 302(q) defines “implementation plan” as including both state and federal implementation plans, so permits could also be auctioned off under a federal implementation plan.

<sup>574</sup> See CAA § 102(c) (“The consent of the Congress is hereby given to two or more States to negotiate and enter into agreements or compacts, not in conflict with any law or treaty of the United States, for (1) cooperative effort and mutual assistance for the prevention and control of air pollution and the enforcement of their respective laws relating thereto, and (2) *the establishment of such agencies, joint or otherwise*, as they may deem desirable for making effective such agreements or compacts.”).

<sup>575</sup> The implementing body would be responsible for monitoring the stringency of the cap and standardizing the eligibility of offset credits. It would also be important to provide emergency relief in case of an economic or energy crisis, since Sections 110(f), 110(g) and 125 are likely insufficient and too slow to respond.

<sup>576</sup> Though EPA would not be able to follow this procedure if using a federal implementation plan for certain states.

<sup>577</sup> A number of mandatory deadlines govern the timetable for setting and implementing a NAAQS regime. Once a criteria pollutant is listed, EPA must issue criteria within a year, though EPA can move faster if possible. CAA § 108(a)(2). NAAQS must be proposed simultaneously with the criteria, and no more than a 90-day comment period can be set before finalizing the standards. CAA §§ 109(a)(1)(B), (a)(2). Despite these rigid deadlines, in practice these first few steps often take several years to complete. Once final NAAQS have been promulgated, EPA must give states at least 120 days (but no more than a year) to designate areas as in attainment, in non-attainment, or unclassifiable. CAA § 107(d)(1)(A). EPA is to finalize these designations as expeditiously as possible (and no more than two years after the NAAQS were finalized); but if EPA plans to modify any designations, it must give states notice 120 days before finalizing the designations. CAA § 107(d)(1)(B). At a minimum, 240 days will likely elapse between the promulgation of NAAQS and the final designation of areas.

States must submit their implementation plans to EPA no more than three years after NAAQS were promulgated. EPA may prescribe a shorter period for submission, but the agency must give states sufficient time to hold the required public hearings and adopt the plan. CAA § 110(a)(1). EPA then has six months to review the plan for completeness and an additional twelve months to approve or disapprove of the plan. CAA § 110(k)(2)-(3). If EPA disapproves, the agency must allow more time for the state to revise (no more than 18 months) or to develop its own implementation plan. CAA §§ 110(c)(1), 110(k). Even if EPA moves as quickly as it can through the process, it will likely still be years before SIPs for greenhouse gases could be enforced. Additional time will be allowed for compliance, depending on state administrative law. Potential lawsuits could further delay or complicate the process.

<sup>578</sup> See Nordhaus, *supra* note 466; *EPA Fighting State Adoption of Strict Mercury Control Regulations*, ENVTL. POL’Y ALERT, May 4, 2006.

<sup>579</sup> However, the precise “requisite” level for any individual greenhouse gas (or combination thereof) is not entirely clear. Besides the lack of any scientific consensus on exactly how quickly or how deeply greenhouse gas emissions must be cut to avoid significant harm, it is unclear what level of harm EPA is required to prevent. Must EPA prevent all potential harms, or only the most egregious? Must it prevent worldwide harms, or only domestic? But note that lack of scientific consensus is not an excuse. “It is irrelevant that the current state of scientific knowledge may make it difficult to set an ambient air quality standard. The Administrator must proceed in spite of such difficulties.” S. REP. NO. 91-1196 (1970) (“The Committee is aware that there are many gaps in the available scientific knowledge of the welfare and other environmental effects of air pollution. . . . A great deal of basic research will be needed to determine the long-term air quality

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goals which are required to protect the public health and welfare from any potential effects of air pollution. In the meantime, the Secretary will be expected to establish such national goals on the basis of the best information available to him.”).

<sup>580</sup> See IPCC 2007 Report, *supra* note 2.

<sup>581</sup> See EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT, *supra* note 5, at 1; see also *supra* note 14 and accompanying text.

<sup>582</sup> See LEGGETI ET AL., *supra* note 15, at 4-5 (noting China’s emissions have surpassed those of the United States).

<sup>583</sup> But see CAA §§ 110(a)(2)(D), 115, 179B (accounting for interstate and international pollution).

<sup>584</sup> For example, the federal government is restricted from giving such regions highway funding. See CAA § 179.

<sup>585</sup> Depending on how EPA chooses to set the NAAQS for greenhouse gases, states may not have any real ability to attain and maintain the requisite air quality levels. For example, if EPA sets a primary NAAQS for high-altitude carbon dioxide concentrations at a level below global averages, the entire country will be in non-attainment, and no state policy could realistically bring down concentrations in the short-term. EPA is not allowed to approve any state implementation plan (SIP) incapable of achieving or maintaining NAAQS. See CAA § 110(k)(5) (“Whenever the Administrator finds that the applicable implementation plan for any area is substantially inadequate to attain or maintain the relevant national ambient air quality standard, to mitigate adequately the interstate pollutant transport described in section 176A or section 184, or to otherwise comply with any requirement of this Act, the Administrator shall require the State to revise the plan as necessary to correct such inadequacies.”). Several possible workarounds have been discussed by legal commentators. If the NAAQS chosen do prove unattainable for all states, Section 179B may allow EPA to approve otherwise adequate SIPs by invoking the fiction that the failure to achieve is due purely to foreign emissions. The standard under Section 179B—that SIPs would be adequate “but for” foreign emissions—will not be precisely met for greenhouse gases: time for existing greenhouse gas concentrations to break down will also be required. But the CAA may support use of a legal fiction to side-step this strict “but-for” standard. See Christopher T. Giovino, *Defending Overstatement: The Symbolic Clean Air Act and Carbon Dioxide*, 30 HARV. ENVTL. L. REV. 99, 154-57 (2006) (arguing for “back-end pragmatism” on the interpretation of Section 179B). There may also be a role for the use of federal implementation plans to step in where states are unable to develop approvable programs. However, such workarounds only help to put approved plans in place; they do not change the fact that the entire country would still be in non-attainment, subject to the consequences of such classification. On the other hand, under some of the scenarios for setting the NAAQS discussed, both approvable SIPs and attainable NAAQS may be possible.

<sup>586</sup> *Whitman v. American Trucking*, 531 U.S. 457, 473 (2001) (agreeing with Solicitor General’s definition); *id.* at 475-76 (“requiring EPA to set air quality standards at the level that is ‘requisite’—that is, not lower or higher than is necessary—to protect the public health with an adequate margin of safety”).

<sup>587</sup> *American Trucking v. EPA*, 283 F.3d 355 (D.C. Cir. 2002)

<sup>588</sup> If Condition A is “sufficient” to achieve Outcome B, then the existence of A automatically leads to B. By contrast, if Condition X is “necessary” to achieve Outcome Y, then Y cannot exist without X, but other factors may be required as well.

<sup>589</sup> NAT’L CTR. FOR ENVTL. ASSESSMENT, EPA, No. 600/P-99/001F, AIR QUALITY CRITERIA FOR CARBON MONOXIDE 1-5 (2000) (“Although indoor sources of CO may be of concern to high-risk groups, their contribution cannot be effectively mitigated by ambient air quality standards.”); *id.* at 7-1 (“The term “ambient air” is interpreted to mean outdoor air measured at ground level where people live and breathe. A great majority of people, however, spend most of their time indoors. A realistic assessment of the health effects from exposure to ambient CO, therefore, must be set in the context of total exposure, a major component of which is indoor exposure.”).

Another criteria pollutant, particulate matter, provides further example. For long-term exposure to particulate matter, the lag time for mortality risks may last up to five years. EPA recognizes that “[t]he delay between changes in exposure and changes in health has important policy implications” for setting NAAQS. NAT’L CTR. FOR ENVTL. ASSESSMENT, AIR QUALITY CRITERIA FOR PARTICULATE MATTER, *supra* note 9, at 7-113. But

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ultimately, no NAAQS can protect the public from past exposures. The particulate matter NAAQS is *necessary* to protect public health (i.e., going forward, it can protect people from dangerous long-term exposures); but it is not *sufficient* to protect public health (i.e., some people already exposed to dangerous levels will experience future health effects even if NAAQS prevents any further dangerous exposures).

<sup>590</sup> S. REP. 101-228, at 393 (1989).

<sup>591</sup> Interpreting the word “requisite” in this way is permissible because the precise meaning of the statutory text is ambiguous. *See* Appendix.

<sup>592</sup> IPCC 2007 Report, *supra* note 2, at 36-37.

<sup>593</sup> *See* C.D. Idso et al., *The Urban CO<sub>2</sub> Dome of Phoenix, Arizona*, 19 PHYSICAL GEOGRAPHY 95 (1998); C.D. Idso et al., *An Intensive Two-Week Study of an Urban CO<sub>2</sub> Dome*, 35 ATMOSPHERIC ENV'T 995 (2001). Carbon dioxide readings across the city dropped rapidly with altitude, returning to a normal non-urban background value of approximately 379 ppm at an air pressure 800 hPa.

<sup>594</sup> Though the original researchers cited Phoenix's unique geography as a possible explanation for the phenomenon (which contributed to wind patterns and to air temperature differentials that promoted solar convection), *see id.*, later studies revealed Phoenix was not unique.

<sup>595</sup> *See* Ctr. for the Study of Carbon Dioxide and Global Change, Urban CO<sub>2</sub> Dome (Non-U.S. Cities), <http://co2science.org/subject/urbancodome.php> (last visited Apr. 21, 2009) (listing citations for various international studies on carbon dioxide domes).

<sup>596</sup> This assumes that ground-level concentrations of carbon dioxide bear a direct relationship to stratospheric concentrations and to the ultimate radiative forcing capacity of all carbon dioxide in the atmosphere. Measurements would have to be taken at the right height to capture all significant anthropogenic sources of carbon dioxide, including tall smokestacks, and EPA would have to pick the right time(s) of day and the right averages.

<sup>597</sup> *See, e.g., Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. On Environment and Public Works*, 110th Cong. (2008) (statement of David Bookbinder, Sierra Club) (noting that NAAQS would have to be set near the pre-industrial concentrations of 280 ppm).

<sup>598</sup> *But see Am. Farm Bureau Fed. v. EPA*, 2009 U.S. App. LEXIS 3562 (D.C. Cir. 2009) (noting that EPA must adequately support its decision).

<sup>599</sup> 531 U.S. 457, 465 (2001).

<sup>600</sup> Although Breyer's concurrence should be approached with caution, to the extent it adopts the health-wealth fallacy. *See* RICHARD L. REVESZ & MICHAEL A. LIVERMORE, *RETAKING RATIONALITY: HOW COST-BENEFIT ANALYSIS CAN BETTER PROTECT THE ENVIRONMENT AND OUR HEALTH* (2008) (discussing the danger of the health-wealth fallacy).

<sup>601</sup> *Whitman*, 531 U.S. at 494 (J. Breyer, concurring) (noting that the word “safe” does not mean “risk-free”).

<sup>602</sup> *Id.* at 473.

<sup>603</sup> Breyer went on to say: “Nor need regulation lead to deindustrialization. Preindustrial society was not a very healthy society; hence a standard demanding the return of the Stone Age would not prove ‘requisite to protect the public health.’” *Id.* at 494. The idea that too much regulation will decrease wealth to such a point that health will suffer is a false and dangerous conclusion. *See* REVESZ & LIVERMORE, *supra* note 600. However, the point that NAAQS need not require complete deindustrialization is valid and relevant.

<sup>604</sup> Carbon dioxide would have direct health effect if concentrations reached 2%, but currently concentrations are only 0.038%, and the highest projections for concentrations in the year 2100 are only for 0.098%. Similarly, nitrous oxide has health effects at 25 parts per million, but currently concentrations only reach 0.32ppm. EPA, TECHNICAL SUPPORT DOCUMENT FOR ENDANGERMENT ANALYSIS FOR GHG EMISSIONS UNDER THE CAA 16 (6th draft, June 21, 2008).

<sup>605</sup> *See id.*

<sup>606</sup> *See* CAA § 172(a)(2) (requiring compliance within five years for primary NAAQS, but only “as expeditiously as practicable” for secondary NAAQS).

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<sup>607</sup> Section 109(a)(2) does say “the Administrator *shall publish* . . . proposed national primary *and* secondary ambient air quality standards for *any* such pollutant.” In a related context, the phrase “shall publish” was interpreted by the Second Circuit Court of Appeals to create a non-optional required action. *See* Chapter 3(A) on case and possible reinterpretation. But that seemingly mandatory language is tempered by other sections of the statute. First, criteria pollutants are those which “endanger [either] public health *or* welfare.” CAA § 108(a)(1)(A) (emphasis added). Congress anticipated that not all criteria pollutants would necessarily endanger both public health *and* welfare; it is unlikely that Congress intended to require EPA to issue standards protecting something that was never endangered. Second, Section 109(c) requires EPA to “promulgate a national primary ambient air quality standard for NO<sub>2</sub> concentrations over a period of not more than 3 hours *unless*, based on the criteria issued under section 108(c), he finds that *there is no significant evidence that such a standard for such a period is requisite to protect public health.*” In other words, Congress foresaw that NAAQS may be unnecessary for certain pollutants at certain exposure levels. *See also Am. Farm Bureau Fed.*, 2009 U.S. App. LEXIS at \*76 (“The petitioners here have failed to distinguish this case from *South Coast*. As we explained there, it would frustrate the purpose of the CAA to read the 1990 amendments as limiting EPA’s ability to revise the NAAQS based on advances in scientific understanding. . . . In *South Coast*, we held that the amendments’ incorporation of the existing one-hour ozone standard did not prevent EPA from revoking that standard and replacing it with one based on an eight-hour averaging time. Likewise, in this case, the reference in the 1990 amendments to an annual mean standard for PM<sub>10</sub> does not require EPA to maintain an annual standard in the face of scientific evidence counseling revocation.”). Finally, when setting primary or secondary NAAQS, the Act instructs EPA to use its “judgment” of what is “requisite.” CAA §§ 109(b)(1) & (2).

EPA did exactly that in 1985 when it revoked the secondary NAAQS for carbon monoxide. Finding no anticipated welfare effects at or near the current ambient concentrations of the criteria pollutant, EPA determined that “no standards appear to be requisite to protect the public welfare.” 50 Fed. Reg. 37494 (Sept. 13, 1985). This revocation provides precedent for EPA to issue only one category of NAAQS for other criteria pollutants if the science justifies such action. Note that, despite the common definition of the terms, nothing in the statute indicates that “primary” NAAQS are a prerequisite for “secondary” NAAQS or that “primary” NAAQS must be more stringent than “secondary” NAAQS.

<sup>608</sup> *See* Proposed Endangerment Finding, *supra* note 112.

<sup>609</sup> *See supra* note 191 (describing legislative history).

<sup>610</sup> *See New Jersey v. EPA*, 517 F.3d 574 (D.C. Cir. 2008) (striking down the Clean Air Mercury Rule).

<sup>611</sup> *See* CAA §§ 111(b), (d).

<sup>612</sup> *See Alabama Power Co. v. Costle*, 636 F.2d 323 (D.C. Cir. 1979) (reconciling two definitions of “major source”).

<sup>613</sup> *See* H.R. REP. NO. 95-294 (1977).

<sup>614</sup> *Id.* (“Section 302 of such Act is amended by adding the following new subsection at the end thereof: ‘(i) (1) The terms ‘emission limitation’ and ‘emission standard,’ and ‘standard of performance’ mean a requirement of continuous emission reduction, including any requirement relating to the operation or maintenance of such source to assure continuous emission reduction.’”).

<sup>615</sup> *See* H.R. REP. NO. 95-564 (conf. report), at 172 (1977); *see also* CAA § 111(a)(1) (explaining that the “standard of performance” must reflect an “emission limitation.”).

<sup>616</sup> *Compare* CAA § 302(k) with CAA § 302(l).

<sup>617</sup> H.R. REP. NO. 95-294 (1977) (explaining that the amendment “clarifies that intermittent or alternative control measures are not permissible means of compliance.”); S. REP. NO. 95-127 (1977) (“This bill includes a definition of the phrase “emission limitation” to clarify the committee’s view that the only acceptable basic strategy is one based on continuous emission control. Intermittent controls or dispersion techniques are unacceptable as a substitute for continuous control of pollutants under this act”). The Senate’s definition was adopted. H.R. REP. NO. 95-564 (conf. report), at 172 (1977).

<sup>618</sup> *See* CAA § 111(b)(5) (“nothing in this section shall be construed to require, or to authorize the Administrator to require, any new or modified source to install and operate any particular technological system of continuous emission reduction”).

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<sup>619</sup> CAA § 111(a)(7).

<sup>620</sup> H.R. REP. NO. 95-564 (conf. report) (1977).

<sup>621</sup> See Lisa Heinzerling & Rena I. Steinzor, *A Perfect Storm: Mercury and the Bush Administration*, 34 ELR 10297, 10309 (2004) (also making two additional arguments).

<sup>622</sup> *Id.*

<sup>623</sup> H.R. REP. NO. 95-294 (“Thus, the committee intends that all standards prescribed in the future under section 111(b) would include the following elements: 1. A standard of performance for continuous emission reduction, which reflects the degree of control achievable by the best technological system for each pollutant (or all pollutants) [FN8] emitted from the source, 2. An enforceable requirement that compliance be achieved by proper operation and maintenance of a technological system as defined in this section, and, 3. In the case of fuel-burning new stationary sources, the standard must require a specified percentage reduction in emissions achievable when applying best technology to untreated fuels.”).

<sup>624</sup> Because with the new Acid Rain trading program in place under Title IV, sulfur dioxide emissions were capped, and so low-sulfur coal was not an issue anymore. *Compare supra* note 613 and accompanying text.

<sup>625</sup> S. REP. NO. 101-228 (1989).

<sup>626</sup> H.R. REP. NO. 95-294.

<sup>627</sup> Heinzerling & Steinzor, *supra* note 621, at 10309.

<sup>628</sup> H.R. REP. NO. 95-564 (conf. report) (“[S]pecific technological requirements may be required in lieu of performance standards only under the same conditions as the Conferees have established for hazardous emission design standards.”); *id.* (explaining the conditions for hazardous emission design standards: “Moreover, the committee expects the Administrator to include numerical performance standards whenever technological advances, improved measurement methods, or other changed circumstances made numerical standards practicable.”); S. REP. NO. 95-127 (1977) (explaining the conditions for hazardous emission design standards: “Section 112 of the existing law has been interpreted by some courts as only allowing the use of numerical emission standards. While the committee has a strong preference for numerical emission limitations, it recognizes that in a very few limited cases, other approaches may be necessary.”). *But cf. id.* (“It is recognized that the source controls may not be available to achieve the full reduction required of a particular source under particular circumstances. In such case, supplementary programs can and should be developed. But this flexibility occurs only after imposition of the continuous emission limitation.”).

<sup>629</sup> H.R. REP. NO. 95-294.

<sup>630</sup> CAA § 111(b)(2).

<sup>631</sup> *Cf.* CAA § 111(b)(1)(A).

<sup>632</sup> CAA § 111(a)(3). Section 111(f) also suggests that Congress was focused on a source’s own emissions.

<sup>633</sup> See Nordhaus, *supra* note 466, at 65.

<sup>634</sup> 136 CONG. REC. S2110 (daily ed. Jan. 23, 1990) (statement of Senator John Chafee, chief sponsor of Title VI).

<sup>635</sup> See *The Implications of the Supreme Court’s Decision Regarding EPA’s Authorities with Respect to Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. on Env’t & Pub. Works*, 110th Cong. (2007) (statement of Ann Klee, former EPA General Counsel).

<sup>636</sup> Sections 202 and 213 are perfect examples. *Compare* CAA § 202 (listing as heading “Motor Vehicle Emission and Fuel Standards”) *with id.* 202(a)(1) (authorizing establishment of “standards applicable to the emission”) *and also with id.* 202(b)(1)(B)(i) (referring to standards promulgated under subsection (a) as “emission standards”) *and id.* 202(b)(1)(C) (same). *Also compare* CAA § 213(a) (listing heading as “Emissions Standards”) *with id.* § 213(a)(4) (authorizing establishment of “standards applicable to the emission”). Section 231 for aircraft engines has the same use of the terms. *Compare id.* 231 (listing heading as “Emission Standards”) *with id.* 231(a)(2)(A) (authorizing promulgation of “emission standards applicable to the emission”) *and* 231(a)(2)(B)(i) (referring to these standards as “emissions standards”).

<sup>637</sup> In its proposed endangerment finding, EPA states that term “‘standards applicable to the emission of any air pollutant’ is not defined, and the Administrator has the discretion to interpret it in a reasonable manner.” Proposed Endangerment Finding, *supra* note 112, at 105. This implies that that phrase means something

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different than “emissions standard.” That argument is weak given the use of the two phrases interchangeably throughout the act. *See supra* note 636. However, even if the phrase were given a meaning different than that for emissions standards, the plain language would not allow a voluntary or informational standard.

<sup>638</sup> CAA § 302 (k).

<sup>639</sup> *Engine Mfrs. Ass’n v. South Coast Air Quality Mgmt. Dist.*, 541 U.S. 246, 252-53 (2004). Additionally, such regulations can apply to actors other than manufacturers of mobile source. *Id.* at 254.

<sup>640</sup> *Massachusetts v. EPA*, 549 U.S. at 533.

<sup>641</sup> CAA § 202(a)(1).

<sup>642</sup> *Strengths and Weaknesses of Regulating Greenhouse Gas Emissions Using Existing Clean Air Act Authorities: Hearing Before H. Comm. on Energy & Commerce*, 110th Cong., 8-9 (Apr. 20, 2008) (statement of Lisa Heinzerling, Professor of Law) (noting this possible interpretation).

<sup>643</sup> CAA § 213(a)(4).

<sup>644</sup> Heavy trucks and motorcycles pose the same concerns as cars and light-trucks and the same theories of regulation will apply to those sources.

<sup>645</sup> Some studies suggest that a 10 % increase in fuel efficiency for automobiles would likely result in a 1-2 % increase in vehicle miles traveled. *See Nat’l Research Council*, EFFECTIVENESS AND IMPACT OF CORPORATE AVERAGE FUEL ECONOMY (CAFE) STANDARDS 19 (2002); DAVID L. GREENE ET AL., FUEL ECONOMY REBOUND EFFECT FOR U.S. HOUSEHOLD VEHICLES, 20 *Energy J.* 1 (1999); JONATHAN HAUGHTON AND SOUMODIP SARKAR, GASOLINE TAX AS A CORRECTIVE TAX: ESTIMATES FOR THE UNITED STATES: 1970-1991, 17 *Energy J.* 103 (1996).

<sup>646</sup> For example, one study compared an economy-wide cap-and-trade program with a large-source cap-and-trade combined with increased average fuel economy standards under CAFE. It found that the latter resulted in costs to the economy (in terms of long-term welfare loss) that were twice as high as the cost associated with an efficient economy-wide cap-and-trade program. Anne E. Smith et. al., *Implications of Trading Implementation Design for Equity-Efficiency Trade-offs in Carbon Permit Allocations* 15 ( Working Paper Dec. 2002), available at <http://www.feem.it/NR/Feem/resources/conferences/PRE2004-01-03-01.Smith.pdf>.

<sup>646</sup> Another inefficiency in either fuel efficiency or GHG limitation standards is created by the long useful life of vehicles currently on the road. It will be many years before motor vehicle fleet will be comprised of vehicles that are subject to the new regulations. It is also possible that because higher-efficiency vehicles are more expensive, consumers may choose to keep their older cars (which will be less efficient than newer models subject to the regulations) for longer before making a new purchase.

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<sup>648</sup> *See supra* note 132 for a discussion of these other states.

<sup>649</sup> Cal. Code Regs. tit. 13, § 1961.1 (2005).

<sup>650</sup> 549 U.S. at 531-32. Additionally, while California’s waiver application was pending, two federal courts held that California’s GHG regulations, and identical regulations adopted by Vermont, are not preempted by the fuel efficiency regime. *Green Mountain Chrysler Plymouth Dodge Jeep v. Crombie*, 508 F. Supp. 2d 295 (D. Vt. 2007); *Central Valley Chrysler-Jeep, Inc. v. Goldstene*, 529 F. Supp. 2d 1151 (E.D. Cal. 2007).

The Energy Policy Conservation Act of 1975 granted the Department of Transportation the authority to issue fuel efficiency (“CAFE”) regulations. 42 U.S.C. § 6201 et seq. The Department delegated this authority to NHTSA. NHTSA must set these standards taking into consideration “technological feasibility, economic practicability, the effect of other Federal motor vehicle standards on fuel economy and the need of the nation to conserve energy.” 49 U.S.C. § 32902(f). The statute expressly preempts state adoption of regulation related to CAFE standards for automobiles, and, unlike the CAA, provides no waiver mechanism. 49 U.S.C. § 32919.

The district courts held that, once granted a waiver by EPA, California’s GHG laws will become “other motor vehicle standards of the government” that NHTSA would need to consider under the EPCA when setting CAFE standards. *Id.* at 347, citing 49 U.S.C. § 32902(f). NHTSA has consistently treated EPA-approved California

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emissions stands as such. *See, e.g.* NHSTA, Average Fuel Economy Standards for Light Trucks Model Years 2008-2011; Final Rule, 71 Fed. Reg. 17,566, 17,643 (Apr. 2006) (codified at 49 C.F.R. pts 523, 533, 537) (discussing California's Low Emissions Vehicle program, for which EPA granted a waiver under the CAA, when setting fuel efficiency standards). Under the CAA, an EPA-approved California standard has the force of a federal regulation as Congress unequivocally stated that "federal standards included EPA-approved California standards." *Green Mountain*, 508 F. Supp. 2d at 346. Thus, although the EPCA preempts state fuel efficiency standards, the California standard—if granted a waiver by EPA—would be a federal standard that NHTSA would need to take into consideration. The courts concluded that the interplay between the "federalized" California standards and EPCA is potentially that of conflict between two federal regulatory schemes, but not one of preemption of a state scheme by a federal scheme. *Id.* at 347.

These courts also held that the California GHG regulation was not a *de facto* fuel efficiency standard because compliance with the GHG regulation can be achieved by means other than improving a fleet's fuel economy, including taking advantage of the regulation's credit for air conditioners, using alternative fuels, or using plug-in hybrid vehicles. *Id.* at 351, 354. Notably, these decisions are not final as they are currently on appeal to federal courts of appeals. There are also two other cases pending in district courts. *See supra* note 133 for discussion of these other cases.

Additionally, in March 2009, NHTSA published a Notice in the *Federal Register* stating it was "reconsidering views regarding preemption under the EPCA of state standards regulation motor vehicle tailpipe emissions of carbon dioxide" and will set forth its position next year. NHSTA, Corporate Average Fuel Economy Standards; Effect Upon State Laws and Regulations; Notice of Intent, 74 Fed. Reg. 11,993 (Mar. 20, 2009). This notice was in response to a Memorandum issued by President Obama in January 2009 directing NHSTA to consider whether any provisions regarding preemption are consistent with the EISA, the Supreme Court's decision in *Massachusetts v. EPA*, and other relevant provisions of law and the policies underlying them. *See id.* at 11994.

This change would undo the pro-preemption language inserted into previous Bush Administration fuel economy regulations. Once finalized, a new NHSTA preemption stance would provide an even stronger case for the legal coexistence of state GHG standards and federal CAFE standards.

<sup>651</sup> *See Green Mountain Chrysler*, 508 F. Supp. 2d at 353 (acknowledging that although these other technologies are not yet widely used, "over the next few years, non-gasoline technologies will be used in a substantially greater percentage of American motor vehicles, and that non-gasoline or mixed fuels will be increasingly available, broadening the means of compliance with the regulation).

<sup>652</sup> *See* discussion of CAFE program at *supra* note 650.

<sup>653</sup> NHSTA, Average Fuel Economy Standards, Passenger Cars and Light Trucks; Model Years 2011-2015; Notice of Proposed Rulemaking, 73 Fed. Reg. 24,352 (May 2, 2008).

<sup>654</sup> NHTSA, Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule, 74 Fed. Reg. 14196 (Mar. 30, 2009) (to be codified at 49 C.F.R. pts. 523, 531, 533, 534, 536, 537). The rule is expected to save about 887 million gallons of fuel and reduce carbon dioxide emissions by 8.3 million metric tons.

<sup>655</sup> Although U.S.-flagged aircraft account for majority of air operations in this country, foreign-flagged aircraft still emit large amounts of GHGs given frequency of flights.

<sup>656</sup> 40 C.F.R. § 87.1(a).

<sup>657</sup> *See, e.g.*, 14 C.F.R. § 129.11 (regulating operation specifications for foreign air carriers and foreign operators of U.S.-registered aircraft engaged in common carriage); 14 C.F.R. § 91.711 (establishing special rules for foreign civil aircraft).

<sup>658</sup> Convention on International Civil Aviation, art. 15, Dec. 7, 1944, T.I.A.S. 1591, 61 Stat. 1180 (ensuring non-discrimination); Stockholm Declaration of United Nations Conference on Human Environment, Principle 21, G.A. Res. 2997, U.N. GAOR, 27th Sess., U.N. Doc. A/ Conf.48/14/Rev/1, 11 I.L.M. 1416 (1972) (ensuring no transboundary harm).

<sup>659</sup> Eur. Parl. and Eur. Union Council, Directive 2008/101/EC (Nov. 19 2008) (incorporating aircraft into its GHG emission trading scheme).

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<sup>660</sup> *Id.* Under the EU legislation, a cap on airline emissions will be set at 97% of historical emissions for 2012 and 95% for 2013. The reference period for past emissions is 2004-2006. Each EU country will be responsible for selling permits to individual airlines that use that country's airports most frequently, and 15% of permits will be auctioned. The law also sets a 15% limit in 2012 on the amount of emission credits that airlines would be allowed to import from non-EU nations. The price for permits would probably be partly set by the European carbon market, and partly by member states under rules that still need to be finalized.

<sup>661</sup> Earthjustice Aircraft Petition, *supra* note 151, at 9-10. Even though section 231 only covers aircraft engines, these operational and design regulations would be considered with EPA's authority. Aircraft engines are responsible for GHG emissions from aircraft, and all these standards, including operational and design standards, will limit the GHG emission from those engines.

<sup>662</sup> IPCC, TECHNICAL SUMMARY; CONTRIBUTION OF WORKING GROUP III TO THE FOURTH ASSESSMENT REPORT 51 (May 2007).

<sup>663</sup> Earthjustice Aircraft Petition, *supra* note 151, at 11-13. Blended wing designs incorporate the engine, wings, and body of an aircraft into a single lifting surface. Silent aircrafts burn less fuel than current planes and reduce noise.

<sup>664</sup> 49 U.S.C. § 44714.

<sup>665</sup> CAA § 213(a)(4) (directing that EPA "may" issue standards once it makes an endangerment finding).

<sup>666</sup> EPA, Final Regulatory Support Document: Control of Emissions from New Marine Compression-Ignition Engines at or Above 30 Liters per Cylinder, at 3-50 (Jan. 2003).

<sup>667</sup> 68 Fed. Reg. at 9,750. In March 2009, the U.S. and Canada petitioned the International Maritime Organization, to designate to as an "Emission Control Area" an area more or less equivalent to the EEZs of the United States and Canada. EPA seeks this designation to prevent, reduce, and control emissions of nitrogen oxides, sulfur oxides, and particulate matter from ships in this area. EPA, Regulatory Announcement, Proposal of Emission Control Area Designation for Geographic Control of Emissions from Ships (Apr. 2009), available at <http://www.epa.gov/otaq/regs/nonroad/marine/ci/420f09015.pdf>. Because EPA chose to pursue this emissions control through international means, in no way implies that EPA could not issue and enforce regulations covering this area on its own under the CAA—particularly when regulating ships within U.S. territorial waters (i.e. ports, internal waters, and 12 miles from shore).

<sup>668</sup> CAA § 213.

<sup>669</sup> See, e.g., *Spector v. Norwegian Cruise Line Ltd.*, 545 U.S. 119 (2005) (upholding Americans with Disabilities Act application to foreign cruise ships in U.S. waters even though statute did not specifically apply to foreign vessels); *Cunard S.S. Co. v. Mellon*, 262 U.S. 100 (1923) (upholding application of National Prohibition Act prohibiting possession of alcoholic beverages to foreign-flagged vessels in U.S. territorial waters).

<sup>670</sup> *Benz v. Compania Naviera Hidalgo*, 353 U.S. 138, 142 (1957) ("It is beyond question that a ship voluntarily entering the territorial limits of another country subjects itself to the laws and jurisdiction of that country."); *Cunard*, 262 U.S. at 124 ("The merchant ship of one country voluntarily entering the territorial limits of another subjects herself to the jurisdiction of the latter. The jurisdiction attaches in virtue of her presence, just as with other objects within those limits. During her stay she is entitled to the protection of the laws of that place and correlatively is bound to yield obedience to them."); *Patterson v. Eudora*, 190 U.S. 169, 178 (1903) ("[T]he implied consent to permit [foreign merchant ships] to enter our harbors may be withdrawn, and if this implied consent may be wholly withdrawn, it may be extended upon such terms and conditions as the government sees fit to impose. And this legislation, as plainly as words can make it, imposes these conditions upon the shipment of sailors in our harbors, and declares that they are applicable to foreign, as well as to domestic, vessels. Congress has thus prescribed conditions which attend the entrance of foreign vessels into our ports, and those conditions the courts are not at liberty to dispense with.").

<sup>671</sup> See U.N. Convention on the Law of the Sea (UNCLOS), Dec. 10, 1982, 1833 U.N.T.S. 397, arts. 5, 8. Ports are considered the equivalent of land territory. That Convention also explicitly permits each a nation to "adopt laws and regulations for the prevention, reduction and control of marine pollution from foreign vessels, including vessels exercising the right of innocent passage." *Id.* art. 211(4).

<sup>672</sup> See, e.g., Deepwater Port Act of 1974, 33 U.S.C. 1518(c) (2) (prohibiting foreign ships from using U.S. deepwater ports if not in compliance with regulations governing those ports); Ports and Waterways Safety



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Act of 1972, 33 U.S.C. 1228(a) (prohibiting vessels from entering U.S. ports that fail to comply with U.S. ship regulations). The U.S. has also issued regulations applying to foreign-flagged ships in U.S. ports and territorial waters. *See, e.g.*, National Park Service, Glacier Bay National Park, Alaska: Vessel Management Plan Regulations; Final rule, 61 Fed. Reg. 27,008, 27,011 (May 30, 1996) (codified at 36 C.F.R. pt. 13) (issuing regulations limiting air emissions from cruise ships in Glacier Bay National Park and noting all of them were foreign).

<sup>673</sup> Countries can regulate in their EEZ for “prevention, reduction and control of pollution” from marine vessels as long as such regulations conform to and give effect to generally accepted international rules and standards. UNCLOS, *supra* note 671, art. 211(5).

<sup>674</sup> *See, e.g.*, Oil Pollution Act of 1990, 46 U.S.C. 3703a(a) (requiring vessels carrying oil to be equipped with a double hull when operating on waters subject to the jurisdiction of the United States, including the EEZ).

<sup>675</sup> The United States Coast Guard regulates vessel speeds under the Ports and Waterways Safety Act. 33 U.S.C. §§ 1221-1250. Under this Act, the Coast Guard “may control vessel traffic in areas subject to the jurisdiction of the United States which are “hazardous, or under conditions of reduced visibility, adverse weather, vessel congestion, or other hazardous circumstances, by . . . (C) establishing vessel size, speed, draft limitations and vessel operating conditions.” *Id.* § 1223 (a)(4).

<sup>676</sup> California Marine Petition, *supra* note 145, at 15.

<sup>677</sup> Earthjustice Marine Petition, *supra* note 146, at 31-32.

<sup>678</sup> 74 Fed. Reg. 16,448.

<sup>679</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,503.

<sup>680</sup> CAA § 169(3).

<sup>681</sup> *Id.*

<sup>682</sup> Foote, *supra* note 344, at 10667-68.

<sup>683</sup> CAA § 172(c)(6).

<sup>684</sup> CAA § 173(c)(1) (“The owner or operator of a new or modified major stationary source may comply with any offset requirement in effect under this part for increased emissions of any air pollutant only by obtaining emission reductions of such air pollutant from the same source or other sources in the same nonattainment area, except that the State may allow the owner or operator of a source to obtain such emission reductions in another nonattainment area if (A) the other area has an equal or higher nonattainment classification than the area in which the source is located and (B) emissions from such other area contribute to a violation of the national ambient air quality standard in the nonattainment area in which the source is located. Such emission reductions shall be, by the time a new or modified source commences operation, in effect and enforceable and shall assure that the total tonnage of increased emissions of the air pollutant from the new or modified source shall be offset by an equal or greater reduction, as applicable, in the actual emissions of such air pollutant from the same or other sources in the area.”).

<sup>685</sup> Section 302(j)’s definition of “major emitting facility,” which applies to NNSR permitting, also references “any pollutant.” However, NNSR is pollutant-specific, and only major sources of the relevant criteria pollutant count as major emitting facilities. Section 302(j)’s definition applies “[e]xcept as otherwise expressly provided,” and therefore the word “any” can be viewed as modified by the express scope of CAA tit. I pt. D. For example, the point of NNSR permit requirements, like offsets, is to achieve “reasonable further progress.” CAA § 173(a)(1)(A). “Reasonable further progress” is defined with respect to “emission of the relevant pollutant...for the purposes of ensuring attainment of the applicable national ambient air quality standard.” CAA § 171(1). NNSR permitting only serves its intended purpose if the source is major specifically for the pollutant in non-attainment. The legislative history supports that NNSR was to apply to major sources of criteria pollutants only. *See* H.R. REP. NO. 95-564 (conf. report), at 172 (1977) (noting that the House bill originally restricted its definition of major source to criteria pollutants, but the Senate added a separate definition specifically for PSD that applied to “any pollutant”).

<sup>686</sup> *See* CAA § 169(2)(C) (referencing the definition in Section 111(a)).

<sup>687</sup> *See* EPA 2008 ANPR, 73 Fed. Reg. at 44,505.

<sup>688</sup> For more on absurd results canon, *see* Appendix.

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<sup>689</sup> See *North Carolina v. EPA*, 531 F.3d 896 (D.C. Cir. 2008) (citing *Whitman*, 531 U.S. at 485) (“All the policy reasons in the world cannot justify reading a substantive provision out of a statute.”).

<sup>690</sup> See *Alabama Power*, 636 F.2d at 405.

<sup>691</sup> See *id.* at 360 (explaining that “[c]onsiderations of administrative necessity may be a basis for finding implied authority for an administrative approach not explicitly provided in the statute” and expressly identifying general permits as an alternative to the exemptions that were at issue in that case). Courts have recognized EPA’s authority to use general permits under section 402 of the Clean Water Act without an express provision authorizing such general permits. See *Env’tl. Def. Ctr. v. EPA*, 344 F.3d 832, 853 (9th Cir. 2003).

<sup>692</sup> In contrast, CWA provides specific authority for the issuance of general permits on a state, regional or nationwide basis under the section 404 “dredge and fill” permit program. 33 U.S.C. § 1344(3).

<sup>693</sup> *NRDC v. Costle*, 568 F.2d 1369, 1381 (D.C. Cir. 1977).

<sup>694</sup> *Env’tl. Def. Ctr.*, 344 F.3d at 853.

<sup>695</sup> See *Alabama Power*, 636 F.2d at 357. The Court noted that an agency could establish the need for such relief based on “a shortage of funds[,] . . . time, or . . . technical personnel.” *Id.* at 358.

<sup>696</sup> *Id.*

<sup>697</sup> See, e.g., *Regulation of Greenhouse Gases under the Clean Air Act: Hearing Before the S. Comm. On Environment and Public Works*, 110th Cong. (2008) (statement of David Bookbinder, Sierra Club).

<sup>698</sup> EPA GHG Inventory, *supra* note 12, at 4-4.

<sup>699</sup> *Id.* A more minor but related category of emissions is when industry uses fossil fuels not for energy consumption but for other purposes, such as the use of petroleum in asphalt and lubricants or use of industrial coking coal. Such uses still generate emissions.

<sup>700</sup> See Comments from the Attorneys General of the States of California, Delaware, New York, Oregon, Vermont, and Washington, and the Commonwealth of Massachusetts, to EPA, Comments on Proposed Rule (Sept. 30, 2008), available at [http://ag.ca.gov/globalwarming/pdf/Portland\\_cement.pdf](http://ag.ca.gov/globalwarming/pdf/Portland_cement.pdf) (commenting on the proposed standards of performance for Portland cement plants, specifically on the lack of standards for GHG emissions). Note that, in addition to their industrial process releases, cement manufacturers use coal to fire their kilns, emitting significant amounts of carbon dioxide in the process.

<sup>701</sup> CAA § 504(d).

<sup>702</sup> See *Massachusetts v. EPA*, 549 U.S. 497 (2007) (holding that both EPA and the Department of Transportation can regulate greenhouse gas emissions from mobile vehicles and there is no implicit preemption of EPA’s authority under the CAA).

<sup>703</sup> See CAA § 111(b).

<sup>704</sup> See Katherine Ling, *100% Emission Auction Unlikely in Senate Cap-and-Trade Bill—Bingaman*, E&E DAILY NEWS, Mar. 5, 2009.

<sup>705</sup> See Lieberman-Warner Climate Security Act of 2008, S. 3036, 110th Cong. (2008).

<sup>706</sup> Consider that a new conventional coal power plant with a 500 megawatt capacity might generate about three million tons of carbon dioxide per year. Thus, the plant will need three million emissions credits under a cap-and-trade system. The new entrant allocations under S.3036 might give that plant nearly two million free credits, meaning the plant would buy one million extra credits. Total emissions would still be three million. Now consider if new source performance standards forced that same new power plant to install technologies to capture 90% of carbon emissions. The plant would now emit only 300,000 tons of carbon dioxide per year, and would correspondingly need only 300,000 allowances. But since the plant would still generate the same amount of electricity, S.3036 would still give the new plant nearly two million free credits. Thus, the plant emits 300,000 tons, sells nearly two million credits (letting purchaser emit nearly two million tons), and does not need to buy one million extra credits (letting some other source buy them and emit one million tons): total emissions are still three million.

<sup>707</sup> See Judson Jaffe, *How Can One Allocation Provision Undermine a Cap-and-Trade Program?* (AEI Regulatory Analysis No. 08-02, Apr. 2008) (explaining that a conventional coal plant would normally need 0.83

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allowances per MWh, but S.3036 would give it 0.52 allowances per MWh, leaving a net requirement of only 0.31 allowances per MWh; a combined cycle gas plant would normally need 0.38 allowances per MWh, but S.3036 would still give it 0.52 allowances per MWh, leaving a surplus of 0.14 allowances per MWh). Notably, existing power plants would be unlikely to receive such free allowances.

<sup>708</sup> *Id.* (i.e., until the allowances are phased out).

<sup>709</sup> *Id.*

<sup>710</sup> See 74 Fed. Reg. 16447.

<sup>711</sup> Another frequently discussed option for new national legislation addressing climate change is to create a “carbon tax.” A carbon tax would place a fee on emissions of greenhouse gases, presumably charging major sources enough per ton of carbon that industry will have a monetary incentive to reduce its emissions. However, a carbon tax offers no absolute guarantee for emissions reductions: if companies are willing to pay the fee, they can continue to emit. Clean Air Act regulations could supplement a carbon tax by enforcing actual emissions reductions. Given the relatively remote chances for a carbon tax gaining sufficient political support, this analysis will not explore further which regulations might best supplement a carbon tax.

<sup>712</sup> For example, under the Lieberman-Warner bill, USDA would have allowances to distribute to agricultural and forestry projects. USDA would be required to distribute allowances to maximize reductions. Imagine two potential projects: for the same amount of money, a dairy farm could cut its methane emissions from 100 carbon-equivalent tons to 50 carbon-equivalent tons, or a forestry project could plant enough trees to soak up 5 carbon-equivalent tons of carbon dioxide. If USDA had 50 allowances to distribute, it would give them to the dairy farm, which would sell the credits to fund the project. The dairy farm would emit 50 less, but some industrial source would emit 50 more. The result is a wash from the perspective of total emissions reductions, but the industrial source was able to find the most cost-efficient way to obtain enough allowances to cover its emissions. Now imagine a performance standard already required the dairy farm to cut its emissions down to 50. USDA could not simply retire its credits; it would have to distribute them to the forestry project. The forestry project would sell the credits to fund its project: some industrial source would emit 50 tons more, and the forestry project would only soak up 5 tons. But the dairy farm has also reduced its emissions by 50 tons. Thus, looking at the total universe of sources, emissions have dropped by 5 tons (+50 - 5 - 50 = -5).

<sup>713</sup> 68 Fed. Reg. at 52,923 (mentioning ICTA’s request in denying its petition).

<sup>714</sup> *Id.* Car manufacturers have already designed more efficient designs and technologies to reduce GHGs, including: Ford’s EcoBoost turbocharged, down-sized direct-injection gasoline engines, Honda’s 2009 global gasoline hybrid and 2009 advanced diesel power train; Toyota and general motor’s plans for gasoline plug-in hybrid systems; GM lower-cost advantage diesel engines; Nissans’ 2010 clean diesel passenger car. EPA 2008 ANPR, 73 Fed. Reg. at 44,447.

<sup>715</sup> See EPA, Smartway Home, <http://www.epa.gov/smartway/>.

<sup>716</sup> See EPA, Green Vehicle Guide Home, <http://www.epa.gov/greenvehicles/Index.do>.

<sup>717</sup> 74 Fed. Reg. 16,448.

<sup>718</sup> In late 2007, responsibility for the program shifted to the National Center for Transit Research at the University of South Florida. National Center for Transit Research, Best Workplaces for Commuters, <http://www.bestworkplaces.org/index.htm>. That program provides qualified employers with national recognition and an elite designation for offering outstanding commuter benefits, such as free or low cost bus passes, strong tele-work programs, carpooling matching and vanpool subsidies.

<sup>719</sup> EPA 2008 ANPR, 73 Fed. Reg. at 44,448. These emissions are particularly from cars and light trucks. Section 609 of the CAA mandates EPA to issue regulations concerning servicing of motor vehicle air conditioners with respect to certain ozone-depleting gases. This section does not prohibit EPA from using Section 202’s more general authority to reduce GHG emissions from motor vehicles.

<sup>720</sup> 74 Fed. Reg. at 16,607.

<sup>721</sup> Increased fuel efficiency standards will not incentivize manufacturers to make these changes either. However, a GHG emissions regulation would.

<sup>722</sup> 73 Fed. Reg. at 44,448-49.

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<sup>723</sup> Cal. Code Regs. tit. 13, § 1961.1(a).

<sup>724</sup> 74 Fed. Reg. 16447.

<sup>725</sup> EPA, Final Regulatory Support Document, *supra* note 666, at 3-50.

<sup>726</sup> California Nonroad Petition, *supra* note 153; ICTA Nonroad Petition, *supra* note 154.

<sup>727</sup> CAA § 213(a)(4).

<sup>728</sup> EPA GHG Inventory, *supra* note 12, at 4-4.

<sup>729</sup> *Id.*

<sup>730</sup> See Lieberman-Warner Climate Security Act of 2008, S. 3036, 110th Cong. (2008).

<sup>731</sup> EPA GHG Inventory, *supra* note 12, at 4-4.

<sup>732</sup> See EPA, TECHNICAL SUPPORT DOCUMENT FOR THE ADVANCED NOTICE OF PROPOSED RULEMAKING FOR GREENHOUSE GASES; STATIONARY SOURCES (2008). Other land use and forest management activities also significantly impact total greenhouse gas emissions, but more likely in terms of their capacity to act as a sink for carbon dioxide emissions rather than as a source emitting pollution.

<sup>733</sup> EPA GHG Inventory, *supra* note 12, at 4-4.

<sup>734</sup> See *supra* note 712.

<sup>735</sup> See Jacobson Testimony, *supra* note 321.

<sup>736</sup> 467 U.S. 837 (1984).

<sup>737</sup> *Sierra Club v. Leavitt*, 355 F. Supp. 2d 544 (D.D.C. 2005) (citing *United States v. Goldenberg*, 168 U.S. 95, 102-03, (1897) and *Lewis v. Barnhart*, 285 F.3d 1329, 1332 (11th Cir. 2002) (per curiam)).

<sup>738</sup> See *United States ex rel. Totten v. Bombardier Corp.*, 380 F.3d 488, 494 (D.C. Cir. 2004) (“[R]esort to legislative history is not appropriate in construing the plain statutory language.”).

<sup>739</sup> *Chevron*, 467 U.S. at 843.

<sup>740</sup> *In re Sealed Case*, 237 F.3d 657, 667 (D.C. Cir. 2001).

<sup>741</sup> *Chevron*, 467 U.S. at 842-846 (emphasis added); see also *id.* at 844 (giving agency interpretations “controlling weight unless they are arbitrary, capricious, or manifestly contrary to the statute”).

<sup>742</sup> *Motion Picture Ass’n of Am., Inc. v. FCC*, 309 F.3d 796, 801 (D.C. Cir. 2002) (citing *Chevron*, 467 U.S. at 843-44, 104 S.Ct. at 2782).

<sup>743</sup> *Lamie v. United States*, 540 U.S. 526, 534 (2004) (“When the statute’s language is plain, the sole function of the courts—at least where the disposition required by the text is not absurd—is to enforce it according to its terms.”); *Perry v. Commerce Loan Co.*, 383 U.S. 392, 400 (1966) (“If the plain meaning of the statute leads to an ‘absurd or futile result[], however, [the Supreme] Court has looked beyond the words to the purpose of the act.’”) (quoting *United States v. American Trucking Ass’ns*, 310 U.S. 534, 543 (1940)).

<sup>744</sup> *United States v. Kirby*, 74 U.S. (7 Wall.) 482, 487, 19 L. Ed. 278 (1868)

<sup>745</sup> *United States v. Ron Pair Enterprises, Inc.*, 489 U.S. 235, 242 (1989).

<sup>746</sup> See *Alabama Power Co. v. Costle*, 636 F.2d 323. But cf. *FPC v. Texaco Inc.*, 417 U.S. 380, 400 (1974) (holding that the FPC had no authority to exempt rates charged by small producers of natural gas from regulation under the just and reasonable standard of the Natural Gas Act; although it recognized that persuasive arguments had been made that the assumptions underlying natural gas regulations did not obtain for such producers, and that continued regulation might even be counterproductive, the Court declared that its role was not “to overturn congressional assumptions embedded into the framework of regulation established by the Act.”).

<sup>747</sup> *Engine Mfrs. Ass’n v. EPA*, 319 U.S. App. D.C. 12, 88 F.3d 1075, 1088 (D.C. Cir. 1996)

<sup>748</sup> *Massachusetts v. EPA*, 415 F.3d 50, 68 (J. Tatel, dissenting) (citing *Appalachian Power Company v. EPA*, 249 F.3d 1032, 1041 (D.C. Cir. 2001)) (discussing what is required to depart from the plain text of “air pollutant”).

<sup>749</sup> *Id.* (citing *Engine Mfrs. Ass’n v. EPA*, 88 F.3d 1075, 1089 (D.C. Cir. 1996)). Notably, courts consider this analysis to be part of *Chevron* step one, and as such do not necessarily defer to the agency interpretation of what deviation, if any, is necessary. See *Mova Pharm. Corp. v. Shalala*, 140 F.3d 1060, 1068 (D.C. Cir. 1998)

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("our review of the agency's deviation from the statutory text will occur under the first step of the Chevron analysis, in which we do not defer to the agency's interpretation of the statute."). Of course, the agency might be able to show that there are multiple ways of avoiding a statutory anomaly, all equally consistent with the intentions of the statute's drafters (and equally inconsistent with the statute's text). In such a case, we would move to the second stage of the Chevron analysis, and ask whether the agency's choice between these options was "based on a permissible construction of the statute." *Id.*

<sup>750</sup> *Alabama Power*, 636 F.2d 323.

<sup>751</sup> *Mova Pharm. Corp.*, 140 F.3d 1060, 1068 (D.C. Cir. 1998) ("But the agency does not thereby obtain a license to rewrite the statute.").

<sup>752</sup> *Id.* (refusing to allow the agency to "embark[ ] upon an adventurous transplant operation in response to blemishes in the statute that could have been alleviated with more modest corrective surgery.").

<sup>753</sup> *NRDC v. Thomas*, 689 F. Supp. 246 (S.D.N.Y. 1988) (quoting *Escoe v. Zerbst*, 295 U.S. 490, 493 (1935)).

<sup>754</sup> *Lexecon Inc. v. Milberg Weiss Bershad Hynes & Lerach*, 523 U.S. 26, 35, (1998).

<sup>755</sup> *Oljato Chapter of the Navajo Tribe v. Train*, 515 F.2d 654, 664 (D.C. Cir.1975). *See also Anderson v. Yungkau*, 329 U.S. 482, 485 (1947).

<sup>756</sup> *See Sierra Club v. Leavitt*, 355 F. Supp. 2d. 544 (D.D.C. 2005) (citing *Bhd. of Ry. Carmen Div. v. Pena*, 64 F.3d 702, 704 (D.C. Cir. 1995) (holding that the statement "each petition [for reconsideration of a final rule] shall be decided not later than 4 months after its receipt by the Docket Clerk," was a discretionary deadline and thus the agency was permitted to act even after the four month deadline had passed)).

<sup>757</sup> *Env't Defense Fund v. Thomas*, 870 F.2d 892, 898-99 (2nd Cir. 1989).

<sup>758</sup> *Bennett*, 520 U.S. at 172; *see also New York v. Thomas*, 613 F. Supp. 1472 (D.D.C.1985) (noting that discretion exists in the Administrator to determine only the *manner* in which the duty is to be executed, not whether it is to be executed).

<sup>759</sup> *Kennecott Copper Corp. v. Costle*, 572 F.2d 1349, 1354 (9th Cir.1978).

<sup>760</sup> *Bluewater Network v. EPA*, 372 F.3d 404, 410 (D.C. Cir. 2004) (internal quotation marks omitted).

<sup>761</sup> Administrative Procedure Act, 5 U.S.C. § 706 (2008). The APA does not apply to certain types of actions under the CAA, but the CAA largely replicates the APA's standard against arbitrary and capricious action. *See* CAA § 307(d)(9); *Ethyl Corp. v. EPA*, 51 F.3d 1053, 1064 (D.C.Cir.1995) (noting that review under the 5 U.S.C. § 706(2)(A) [is same as under CAA]).

<sup>762</sup> *AT&T Corp. v. FCC*, 349 F.3d 692, 698 (D.C. Cir. 2003) (internal quotation marks omitted).

<sup>763</sup> *Allied Local & Reg'l Mfrs. Caucus v. EPA*, 215 F.3d 61, 68 (D.C. Cir. 2000) (quoting *Motor Vehicle Mfrs. Ass'n of the U.S. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)).

<sup>764</sup> *NRDC v. Thomas*, 689 F. Supp. 246, 255-56 (S.D.N.Y. 1988).

<sup>765</sup> *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007).

<sup>766</sup> *See American Lung Ass'n v. Reilly*, 962 F.2d 258 (2d Cir. 1992) ("When the administrator misses a statutorily-imposed deadline, his failure is not reviewed on a 'reasonableness' basis. Only when a statute requires agency action at indefinite intervals, such as 'from time to time,' can 'unreasonable delay' be a meaningful standard for judicial review. In contrast, when, as here, a statute sets forth a bright-line rule for agency action, such as in 42 U.S.C. § 7409(d)(1) ('Not later than December 31, 1980, and at five-year intervals thereafter, the Administrator shall complete a thorough review . . .'), there is no room for debate---Congress has prescribed a categorical mandate that deprives EPA of all discretion over the timing of its work.").

<sup>767</sup> Note that some specific petition procedures in certain sections of the CAA do provide a timeline. *See, e.g.,* CAA § 111(g).

<sup>768</sup> 5 U.S.C. § 553(e) (2008).

<sup>769</sup> *See NRDC v. EPA* 902, F.2d 962 (D.C. Cir. 1990) ("The Administrative Procedure Act's ('APA') mandate for courts to 'compel agency action . . . unreasonably delayed,' 5 U.S.C. § 706(1) (1988), is inapplicable to judicial review of a number of types of EPA rulemaking pursuant to the CAA, including rulemaking on NAAQS revisions.").

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<sup>770</sup> See Daniel P. Selmi, *Jurisdiction to Review Agency Inaction Under Federal Environmental Law*, 72 IND. L.J. 65 (1996); *NRDC v. EPA*, 902 F.2d 962 (D.C. Cir. 1990) (“The CAA’s complex scheme for judicial review of EPA’s performance, however, has given rise to conflicting interpretations as to which court has jurisdiction over claims that EPA has not fulfilled its obligations in this regard.”).

<sup>771</sup> For example, the D.C. Circuit Court of Appeals uses a six-prong test to review whether it should grant mandamus ordering the agency to act, such as in cases of unreasonable delay under the APA or in failure to respond to a court order. That standard, established in *TRAC*, assess the delay along six dimensions: “(1) the time agencies take to make decisions must be governed by a ‘rule of reason,’... (2) where Congress has provided a timetable or other indication of the speed with which it expects the agency to proceed in the enabling statute, that statutory scheme may supply content for this rule of reason... (3) delays that might be reasonable in the sphere of economic regulation are less tolerable when human health and welfare are at stake... (4) the court should consider the effect of expediting delayed action on agency activities of a higher or competing priority... (5) the court should also take into account the nature and extent of the interests prejudiced by delay...; and (6) the court need not ‘find any impropriety lurking behind agency lassitude in order to hold that agency action is ‘unreasonably delayed.’” *Telecommunications Research and Action Center v. FCC*, 750 F.2d 70 (D.C. Cir. 1984). Certain other courts also follow the *TRAC* approach. *Shinnecock Indian Nation v. Kempthorne*, 2008 U.S. Dist. LEXIS 75826 (E.D.N.Y. 2008); but see *Karimushan v. Chertoff*, 2008 U.S. Dist. LEXIS 47167 (E.D. Pa. 2008) (following a four-part test for unreasonable delays established by the Third Circuit).

<sup>772</sup> See *TRAC*, 750 F.2d 70 (“decisions must be governed by a ‘rule of reason’”).

<sup>773</sup> *Mashpee Wampanoag Tribal Council, Inc. v. Norton*, 336 F.3d 1094, 1100 (D.C. Cir. 2003). (“Resolution of a claim of unreasonable delay is ordinarily a complicated and nuanced task requiring consideration of the particular facts and circumstances before the court.”).

<sup>774</sup> *Her Majesty the Queen in Right of Ontario v. EPA*, 912 F.2d 1525 (D.C. Cir. 1990).

<sup>775</sup> *PCHRG v. Auchter*, 702 F.2d at 1158.

<sup>776</sup> *Sierra Club v. Thomas*, 828 F.2d 783 (D.C. Cir. 1987). Because the Act imposed deadlines in some areas, we must conclude that Congress’ failure to impose deadlines elsewhere was not inadvertent. *Id.* at 797.

<sup>777</sup> *Mass v. EPA*, No. 03-1361 (D.C. Cir. June 26, 2008) (J. Tatel, concurring and dissenting) (citing *Midw. Gas Users Ass’n v. FERC*, 833 F.2d 341, 359 (D.C. Cir. 1987) (“[T]his court has stated generally that a reasonable time for an agency decision could encompass ‘months, occasionally a year or two, but not several years or a decade.’”).