

Testimony of

Jason Burnett

Private Citizen

**Former Associate Deputy Administrator,
Environmental Protection Agency**

Before the

Committee on Environment and Public Works

U.S. Senate

Hearing:

“Regulation of Greenhouse Gases under the Clean Air Act”

September 23, 2008

Greenhouse Gas Regulation: Putting the Clean Air Act to Work

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Introduction

The April 2nd, 2007, *Massachusetts v. EPA* Supreme Court decision fundamentally, profoundly, and permanently changed the regulatory landscape by finding that the Clean Air Act applies to greenhouse gases. Since greenhouse gases clearly endanger the public, the law requires regulation of greenhouse gases from a wide variety of mobile and stationary sources. The Supreme Court decision has therefore shifted the debate from *whether* we regulate greenhouse gases to *how* we do so. Regulation is coming, either under the current Clean Air Act or under a new, better law.

I intend to offer a glimpse into what future Clean Air Act regulation may entail, including what some of the opportunities and challenges may be. Some of these challenges are fundamental to any system of greenhouse gas regulation, but other challenges are specific to the Clean Air Act and therefore unnecessary if Congress passes new legislation. I hope this testimony is helpful to Congress as it continues oversight of the response to the Supreme Court, but perhaps more importantly I hope it helps to establish the regulatory baseline against which Congress can evaluate new legislation. If Congress does not pass new legislation, the Clean Air Act will be the nation's climate change law, for better or worse.

In order to help understand the ramifications of regulation under the Clean Air Act, I will identify three principles that I hope most can agree should be part of any sensible climate policy. I will consider how various sections of the Clean Air Act would perform relative to these principles. I will then explore how targeted amendments to the Clean Air Act can greatly improve its application to greenhouse gases both for the environment and for the economy. Finally, I will explain how new legislation can perform better than the Clean Air Act.

Background and History

This testimony builds off of the work of the federal government since the time of the Supreme Court decision. As Associate Deputy Administrator at the Environmental Protection Agency (EPA) in charge of energy and climate policy for

the year following the Supreme Court decision, I oversaw and coordinated much of the effort to develop a plan for using the Clean Air Act to regulate greenhouse gases. The credit for the work goes to the large team of scientists, lawyers, engineers and economists at the EPA and across the government. The general approach that I will put forward represents the plan that had the support of many parts of the Administration and was presented to President Bush as the best way to move forward under existing law. It is my understanding that President Bush initially agreed with the plan but later reversed himself in favor of leaving the challenges to the next President. The White House asked the EPA to backtrack from its plan and instead to develop an Advanced Notice of Proposed Rulemaking that not only incorporated the plan we had developed but also a range of other options, even though most everyone agreed those other options were inferior. For example, the EPA plan was to focus on the largest sources of greenhouse gas emissions but the White House asked us to include the possibility of regulating much smaller sources. The White House's desire to have a focus on smaller sources did not come from any belief that regulating smaller sources would make good policy sense but rather from a desire to obscure the clear case for regulating the larger sources with a discussion of the complexity of the Clean Air Act. It was during this negotiation that I left my position at the EPA. In the end, the Advanced Notice of Proposed Rulemaking approach allowed this Administration to avoid making any regulatory decisions.

Assuming the next President puts the responsibility for governing above the desire to develop and maintain an anti-regulatory legacy, we likely will see a system similar to what the EPA had developed for President Bush's consideration. Even if the next President chooses not to move forward voluntarily, it is likely that court cases will force action. That is, unless Congress acts first.

Principles for Regulation

After the Supreme Court case last year, the EPA was faced with the question of how to regulate greenhouse gases. We asked three related questions: What is the best way to move forward with the Clean Air Act? What are the limitations of the Clean Air Act? What legislative changes could address these limitations? In order to

structure the consideration of various options for regulating greenhouse gases, the EPA was guided by a set of principles and “policy and economic considerations.” I have taken a similar approach, building off of EPA’s work, and include a similar set of principles that reflect my judgment of important characteristics of any greenhouse gas regulatory program. I will then evaluate how well various Clean Air Act options line up against these suggested principles.

Principle A: Act Now and Pick Up Momentum

Sensible climate policy requires we act now to begin a smooth transition to a low carbon economy rather than waiting longer and requiring a faster, more disruptive transition. By acting now we will deploy cost-effective, available technologies that just need a moderate market signal. We also need to ensure the research and development pipeline – from basic research and early-stage development all the way through to technologies almost ready for commercial deployment – is full. All of these stages in research and development will benefit from a credible, consistent expectation of a robust market for new technologies. Any new technologies invented or brought to market at scale can then be exported to other countries. If the U.S. does not act now, we risk becoming the importer, not the exporter, of the next generation technologies.

By beginning gradually and picking up momentum, climate policy will allow the market and our citizens to make small adjustments that, in aggregate, add up to big changes. Economists talk about the short-run as the time period when capital infrastructure is fixed and the long-run as a period when capital infrastructure is replaced. We need policies that address the short-run by preventing unnecessary disruptions and premature retirement of our infrastructure, and address the long-run by not encouraging antiquated infrastructure to remain beyond its useful life and not allowing new long-lived investments to lock in failure.

Principle B: Be Careful

Sensible climate policy that will likely last decades should not be overly confident or prescriptive. We can learn from previous environmental policies like

the acid rain program, but we need to be careful to also consider the differences. The acid rain program primarily deployed existing (scrubber) technology and used existing capital infrastructure (railroads) more efficiently. Climate policy should be partially designed to deploy existing technology and use existing capital infrastructure more efficiently but should also have an eye towards developing and deploying technologies that have not yet been invented. This difference means that a climate policy predicated only on the deployment of existing technologies would provide a smaller reduction in emissions than is desirable. Instead climate policy should expect and promote technological change but needs to recognize that we do not yet know how or when new technological breakthroughs will occur. The inherent uncertainty created by a reliance on new technologies means that a climate policy should have flexibilities that allow for larger emissions reductions if technology develops rapidly, and smaller emissions reductions if technology takes more time to develop.

Climate policy should also recognize that any conceivable level of emissions reduction of the U.S. acting alone will not be enough to avoid potentially catastrophic climate change. It makes no sense, therefore, to claim that any given level of emissions reduction is sufficient if more reductions can be achieved cost-effectively. The U.S. could eliminate its greenhouse gas emissions tomorrow and, if no other countries followed our lead, the world would still face an unacceptable risk of catastrophic climate change. Nevertheless, if the U.S. significantly reduces its emissions without harming our economy, other countries are more likely to follow our lead and we can collectively reduce the risk of climate change. Seen in this regard, the absolute quantity of emissions reductions is secondary to developing an aggressive system that others will want to mimic.

Even those who believe we should reduce emissions at all costs must recognize the political reality of the situation. Perhaps the worst outcome for sensible long-run climate policy is for the first serious national effort to be seen, correctly or incorrectly, as being overly costly or burdensome. The political backlash of such a scenario could set back climate policy for decades. This scenario is more

likely for the Clean Air Act than new legislation because of some of the unnecessary regulatory burden created by the structure of the Clean Air Act.

Principle C: Consider Economics

Sensible climate policy should consider the economics of action and inaction. Climate policy will affect our economy just as economic policy will affect our climate. Economic decisions should therefore be made with consideration of their climatic implications and climate policy decisions should be made with consideration of their economic implications.

Much of the discussion about the costs of climate policy has focused on the costs of taking action but inaction has its own costs. Inaction will lead to more resources spent to adapt to a changing climate, an increased likelihood that large parts of our society will not be able to adapt sufficiently to avoid serious harm, and unavoidable damage to our natural systems. Inaction will also lead to increased security risks for regions of the globe that do not have the infrastructure or institutions to adapt quickly. A sensible climate policy will balance the costs of action with the costs of inaction; focusing on one side of the equation will create a distorted response. Action will save us money by availing ourselves of less expensive opportunities; continued inaction will only increase the costs of emissions mitigation or, if we do not mitigate, of the costs to our society and the globe of inaction.

A balancing of the costs of action with the costs of inaction will require putting a positive price on carbon dioxide and other greenhouse gases, either explicitly and transparently or implicitly and opaquely. Since carbon is embedded in each and every product and service, a price on carbon dioxide will change our economy in fundamental ways.

Characteristics of Greenhouse Gases

Several ways that greenhouse gases differ from other types of air pollution regulated by the EPA explain some of the challenges of using the Clean Air Act to regulate greenhouse gases. Our nation's air pollution program has been one of the

most successful public health government interventions in recent memory. In the past several decades the most dangerous types of air pollution such as lead and fine particles have declined across most of the U.S., allowing Americans to live longer and healthier lives. Reducing air pollution has generally been a very good investment, often producing five to ten dollars in public health benefits for every dollar spent reducing air pollution.

The Clean Air Act has not been used specifically to reduce greenhouse gases and it will take a lot of work for greenhouse gas policy under the Clean Air Act to be nearly as successful as the policies to reduce other forms of air pollution. This is due to several differences between greenhouse gases and the other types of air pollution that the EPA already regulates.

- First, greenhouse gases are inherently long-lived in the atmosphere and therefore global in nature. Protections against pollution hotspots required by the Clean Air Act are unnecessary for greenhouse gases. This unnecessary regulation will lead to increased costs with little to no benefit. The Clean Air Act works for other pollutants in part because those communities who bear the costs usually also reap the benefits. However, the geographical and temporal connection between costs and benefits for greenhouse gases is not as straightforward; actions today in one community will benefit not only current and future generations of Americans but will also benefit other countries.
- Second, greenhouse gases are emitted in much higher volumes than other air pollutants. Small sources of other air pollutants such as large-scale retail stores and apartment buildings may emit enough greenhouse gases to now be classified as large sources. This will increase the number of sources subject to various permitting requirements.
- Third, the methods for reducing greenhouse gas emissions will be significantly different than the methods for reducing other air pollutants. Most other air pollutants can be controlled by devices attached to the

smokestack or tailpipe that work by removing the pollutants from the exhaust stream. These post-combustion controls do not yet work at a commercial scale for carbon dioxide, the most significant greenhouse gas. Instead, at least for the next decade or two, reductions in carbon dioxide emissions will largely depend on changing how we generate and use energy. Only later can we begin to expect post-combustion control technologies to be capable of removing carbon dioxide from the exhaust stream. The Clean Air Act was designed primarily to place regulations at the point of combustion to force post-combustion controls. Since much of the near-term greenhouse gas emissions reductions will not occur through post-combustion controls, the EPA should consider opportunities where the Clean Air Act permits regulation at other stages in the production and use of energy.

- Fourth, the Clean Air Act is designed as an environmental and human health law with somewhat limited attention to the country's financial and economic systems. Such an approach has worked for traditional pollutants because add-on controls have generally been available and affordable to the polluting industries, enabling significant reductions in air pollution without resulting in large-scale economic adjustments. Reductions in greenhouse gases will more fundamentally alter the organization of our economy and the design of our communities. We should work to find ways to align environmental and economic objectives when possible, and to balance the dual objectives when tradeoffs are necessary.

These four differences between greenhouse gases and other air pollutants explain the particular challenges of using the Clean Air Act for greenhouse gases, even though it has worked very well for other air pollutants.

The Clean Air Act: Basic Structure

Sections of the Clean Air Act can be divided into three categories; those designed to regulate mobile sources, those designed to regulate stationary sources, and those designed to regulate both. The interconnections between the stationary

source sections and the mobile source sections come in three forms. First, certain terms such as “air pollutant” need to be defined consistently across programs. This means that if the EPA decides, for purposes of mobile source regulation, to define all greenhouse gases collectively as the “air pollutant” rather than taking each individual gas separately, then it should use the same approach for stationary sources. Second, some choices for how to regulate mobile sources would create additional layers of stationary source regulation above and beyond what is required by the stationary source section alone. For example, some mobile source regulations such as a low-carbon fuel standard and the existing Renewable Fuel Standard are primarily mechanisms to indirectly reduce stationary source emissions. Such interconnections will become even more important as plug-in hybrid vehicles and other similar technologies blur the line between emissions attributable to stationary sources and those attributable to mobile sources. Third, certain policy precedents will be created by the first few federal greenhouse gas regulations. These precedents can be changed over time but will set the general direction for subsequent regulation. For example, the EPA will need to determine what timeframe to consider for Clean Air Act regulations, how the stringency changes over time, and whether to regulate greenhouse gases as they enter the economy or as they enter the atmosphere.

The Clean Air Act: Mobile Sources

Mobile source greenhouse gas regulation is fairly straightforward and will be addressed first. Mobile source regulations typically take the form of performance standards, meaning that the EPA would stipulate what emissions are allowed for particular applications, allowing for some flexibilities through averaging, banking, and trading. Mobile source programs can be designed to encourage the deployment of existing technologies and to allow flexibility in providing adequate lead-time for the development and deployment of new technologies. The Clean Air Act requires regulation of some mobile source sectors; for example, Section 202 covering cars, trucks, and other on-road vehicles specifies that the Administrator “shall” issue regulations. Clean Air Act greenhouse gas regulations for cars and trucks could

mirror in almost all respects the fuel economy standards being issued by the Department of Transportation. One notable exception is that the EPA will eventually grant the California vehicle waiver and should therefore take that vehicle greenhouse gas program into account in designing a similar national program. Although the EPA could mimic the Department of Transportation, it does not need to do so; the Clean Air Act could be used to provide a longer planning horizon for manufacturers and more flexibility in compliance than allowed by Department of Transportation regulations.

The Clean Air Act allows for but does not require regulation of certain other mobile source sectors; for example, Section 211(c) covering fuels specifies that the Administrator “may” issue regulations. The EPA could pursue a low-carbon fuel standard similar to the program being developed in California and use such a standard to rectify some of the limitations of the recently enacted Renewable Fuel Standard. For example, the EPA could provide for additional incentives for next generation biofuels and provide market signals to move industry towards those biofuels that are particularly beneficial from the standpoint of reduced greenhouse gas emissions.

How would mobile source regulations line up against the three principles I laid out above?

Principle A: Act Now and Pick Up Momentum

Mobile source regulation could be issued in short order. The EPA could act very quickly under a new Administration to review, modify, and issue the regulations based on the work the EPA did last year. The existing draft regulations simply rely on an orderly deployment of existing technologies over the next decade. This approach could realistically be done within 18 months of a new Administration taking office.

Using the work that the EPA did last year, however, does not adequately capture the potential of new technology because our work did not account for the fact that manufactures certainly can and likely will comply by developing new

technologies. This limitation came directly from the computer model currently being used by the Department of Transportation and the EPA to develop the stringency of the regulations. By not accounting for technological change, the model only accounts for the reductions that can be achieved in the early years by applying existing technologies, but largely ignores the additional reductions that will be possible in later years as new technologies are developed. The model therefore incorrectly estimates that the only significant improvements in fuel economy will be achieved in the first few years of a program followed by a long period of no additional progress. The Clean Air Act does not require the use of this model: The EPA should improve the model or use a different one. A more sophisticated model would consider the likelihood of new technologies, especially over a longer time period. Such an approach would have a similar phase-in for existing technologies and could require far greater improvements in fuel economy and reductions in greenhouse gases the long-run after allowing for the development of new technologies. The expectation of a robust market for new technologies to meet the more aggressive standards would cause more companies to invest in research and development.

Principle B: Be careful

Regulatory systems typically have three ways of dealing with unforeseen events. Well-designed systems can have sufficient flexibility to weather a storm without active involvement by the regulators. If that doesn't work, some systems allow for temporary interventions by the regulator. And if that doesn't work, systems break and need to be rebuilt or replaced. Clean Air Act mobile source programs have typically fallen into the second category by relying on waivers to address short-term unexpected events. While this system works after a fashion, it creates market uncertainty, encourages political rent-seeking, and allows for the EPA to meddle in the market by adjusting the stringency of a regulation on an ad hoc basis.

For greenhouse gases, any mobile source program should be able to provide sufficient temporal flexibility to obviate or reduce the need to rely on waivers for

short-term unexpected events just as the acid rain program has not typically relied on waivers. Instead it will be the long-run unexpected events that will require careful attention. For example, predicting the rate of technological change is inherently an uncertain business because it involves guessing when someone will have some clever idea about how to do things better. The EPA has tried to predict the rate of technological change by assuming that the future rate of change will reflect the past rate of change, with some adjustments. The EPA has also done engineering calculations to estimate when there has been enough time and money spent on a new technology to bring it to market. Neither approach is very accurate.

The challenge for the EPA will be to design a system with enough long-run flexibilities so that the system works well even though the forecasts for technological change later will be found to be less than perfect. Ideally this will be done without active involvement of the regulators after regulations have been developed and the initial market has been created. The simplest mechanism for accomplishing this is to allow the level of reductions required by the system to self-adjust with the actual development and performance of technologies. This is most easily done by relying on the market signals themselves: if the cost of reducing emissions gets high the market is signaling that technologies are not being developed as planned, and if the cost of reducing emissions gets low the market is signaling that more technologies than expected have been invented and are being deployed. More emissions reductions should be required when the cost of doing so is low, and fewer emissions reductions should be required when the cost is high. This system will create a more stable price and therefore more certain rewards to those developing new technologies. Reducing price volatility will make investing in new technologies less of a gamble and therefore more attractive to businesses. Such an automatic price adjustment mechanism may be possible under the Clean Air Act but it almost certainly will be subject to legal challenge.

Principle C: Consider Economics of Action and Inaction

The mobile source section allows for a consideration of a range of relevant factors such as costs and benefits in developing a regulatory program. The program

can and, in the case of greenhouse gases, should be designed to include various market flexibilities such as averaging, banking, and trading, at least within a sector and between sectors if possible.

The mobile source provisions of the Clean Air Act will work fairly well with no legislative change, although the EPA would benefit from rethinking how it uses the Clean Air Act mobile source authority given the unique challenges posed by greenhouse gas regulation. While I was at the EPA we were not permitted to do so because the EPA's target was predetermined by President Bush. The next President should not put the EPA in this regulatory straightjacket if he wants to achieve larger reductions in greenhouse gases and greater reductions in gasoline consumption at the lowest cost.

The Clean Air Act: Stationary Sources

Relative to mobile sources, stationary source regulation under the Clean Air Act is much more complicated and will take more creative thinking to work well. This added complexity comes from two differences between stationary sources and mobile sources. First, the EPA's mobile source authority applies primarily to new sources while its stationary source authority extends to both new and existing sources. Second, several of the features of the stationary source program are designed to address pollution hotspots, a concern that does not apply to a pollutant like greenhouse gases, yet the unnecessary hotspot protections will make greenhouse gas regulation more expensive.

The EPA has identified three basic options for regulating greenhouse gases from stationary sources under the Clean Air Act:

NAAQS Option: The EPA could list greenhouse gases as a criteria pollutant, leading to National Ambient Air Quality Standards (NAAQS), attainment designations, state implementation plans, and transportation conformity.

Hazardous Air Pollutant Option: The EPA could list greenhouse gases as a Hazardous Air Pollutant, leading to maximum achievable control technology standards and periodic risk reviews.

Section 111 Option: The EPA could find that greenhouse gases are not appropriately listed as either criteria or hazardous air pollutants and instead issue regulations under Section 111.

The NAAQS Option and the Section 111 Option would also need to be combined with the new source review program for greenhouse gases. Other sections of the Clean Air Act can be used in addition to choosing one of the three options above but for sake of simplicity I will focus on these three options and will then explain why the Section 111 option is preferable.

NAAQS for Greenhouse Gases

The NAAQS option would not work very well. The NAAQS system would take years to get up and running but then would set unrealistic deadlines. This “act later and start aggressively” approach is the opposite of the “act now and pick up momentum” principle. The NAAQS sets and locks the U.S. into a goal that can only possibly be met with international cooperation. This would likely be done before we know what level of cooperation we will have from other countries, failing the principle about being careful and not being overly confident. Setting of the NAAQS must be done without consideration of technology, costs or feasibility and so would fail the “economics” principle.

Given all of these downsides, it should not be a surprise that very few individuals or groups support a NAAQS for greenhouse gases. In fact, the only people who have expressed an interest in this option are those who place enormous value in the fact that the NAAQS system would take a long time to establish and therefore would delay action for some number of years and who have great confidence in Congress coming to the rescue before the greenhouse gas NAAQS becomes effective.

Greenhouse Gases as Hazardous Air Pollutants

The Hazardous Air Pollutant option scores a little better when measured against the three principles of sensible climate policy. Greenhouse gases could be listed as a Hazardous Air Pollutant fairly quickly and the standards required by the

program would likely work to deploy *existing* technologies since they are generally based on the best performing *existing* units. However the program would not do a very good job of creating ongoing incentives for the development of new technologies since facilities would not be rewarded for exceeding what existing technology already achieves.

The Hazardous Air Pollutant option, rather than beginning gradually and picking up momentum, would start all at once and then would not be adjusted for another eight years. This risks retiring capital prematurely by requiring all facilities to come up to the same level of greenhouse gas performance simultaneously without regard for individual circumstances. However, the facilities that do make the necessary upgrades would only have incentives to plan for periodic rounds of improvements rather than to remain flexible and continually improve over time. The Hazardous Air Pollutant program can be thought of as a technology stair-step, alternating between periods of rapid change and periods of no change; it would be far preferable to design a ramp or glide path to provide incentives for continuous improvement. By alternating between requiring large improvements and requiring no improvements, the Hazardous Air Pollutant system would waste resources by making some facilities obsolete immediately and causing others to make drastic changes in operations rather than making these same changes in a more organized way over time.

The first phase in the Hazardous Air Pollutant standard setting process is to set the Maximum Available Control Technology for larger emitters. Despite its name, such “technology” standards actually do not allow for consideration of technical feasibility or costs except in certain circumstances. The standards would almost certainly apply at the facility or unit level and not allow flexibilities and associated cost-savings afforded by averaging regulatory burden across facilities. The standards would likely vary substantially between industries based largely on current emission performance rather than future prospects for cost-effective emissions reductions. Finally, standards under this section of the Clean Air Act would apply to exceedingly small facilities. While there is no doubt that small and

large emitters alike can and should reduce their emissions, inflexible facility-by-facility standards would be even more costly if applied to small sources of emissions. For these reasons, the Hazardous Air Pollutant option fails the economics principle.

Some have advocated the Hazardous Air Pollutant option because it would preclude the application of new source review (NSR) to greenhouse gases. This may reduce the regulatory complexity and provide more certainty for large industrial sources because the Hazardous Air Pollutant program generally is only updated every eight years while the new source review program can potentially provide an ongoing set of regulatory requirements for relatively minor changes in operations. While larger sources may prefer the Hazardous Air Pollutant option to the new source review option, smaller sources likely would not because the Hazardous Air Pollutant option applies to sources one-tenth the size as would be subject to new source review.

Section 111 Regulation for Greenhouse Gases

The final option for stationary sources is to reject both a NAAQS and a Hazardous Air Pollutant listing for greenhouse gases and channel regulation into Section 111, the New Source Performance Standard. Despite “new source” being in its name, the Section 111 applies to both new sources and existing sources through a combination of EPA and state regulations. The primary advantage of Section 111 is its flexibility, allowing for a wide range of regulatory systems. Unlike the stair-step of the Hazardous Air Pollutant program, the program under Section 111 could create a phased glide path, creating ongoing incentives for technological improvements.

In order to design a program under Section 111, a set of initial questions would need to be answered:

- How would sources be categorized? Broad categories might include, for example, all combustion sources over a certain size. Since it is easier to allow for trading within a category, broad categories would

be more flexible and therefore probably most cost-effective. On the other hand, narrow categories would allow for a more targeted and tailored approach to accommodate particular circumstances.

- What types of sources should be included? Should the focus be only on the largest sources such as power plants, industrial boilers, cement kilns, and petroleum refineries or should the EPA set standards for smaller sources? The EPA has historically used a range of factors to determine what sources should be regulated under Section 111 for particular types of air pollution. The EPA could exercise similar discretion for greenhouse gases.
- How much emphasis should be placed on the new sources versus the existing sources? It is possible to create a program under Section 111 that places most of the emphasis on new sources being built cleaner and designed to be more efficient but doing so can retard the natural turnover of capital stock by increasing the cost of a new facility relative to continued operations of an existing facility. Alternatively, a Section 111 program can set a relatively modest new source standard and use the existing source standard to drive the emissions reductions.
- Finally, the existing source standards are developed jointly by EPA and state regulators. How much guidance would the EPA want to provide to states? The Clean Air Act does not allow the EPA to restrict states from designing their own systems but the EPA could attempt to design a system that many states would want to adopt outright. Alternatively, the EPA could leave much of that design to individual states working alone or in groups like the Regional Greenhouse Gas Initiative and Western Climate Initiative.

The flexibility of Section 111 allows a suitably designed system to align more favorably with the unique characteristics of greenhouse gases. Although Congress

did not specifically design the Clean Air Act for greenhouse gases, the EPA can use the Clean Air Act to design a Section 111 program to work fairly well.

Principle A: Act Now and Pick Up Momentum: Section 111 can be used immediately – likely within the first year or two of a new Administration – to issue regulations applicable to most of the stationary source emissions. During the policy debate in the fall of 2007, the EPA had developed a plan to draft and finalize regulations under Section 111 covering the largest sources and well over half of U.S. stationary source emissions by the end of 2008. This plan would have required moderate improvements in the greenhouse gas profile of four of the largest stationary source sectors. Because the improvements were modest and largely would be in the form of efficiency improvements which have the additional benefit of reducing fuel costs, the economic impact of the program would have been minimal. However, since the sectors were the largest in the country, even small improvements would have translated into large reductions in greenhouse gas emissions. While the White House did not allow EPA Administrator Johnson to move forward with this plan, it does demonstrate how quickly a new Administration could act.

Section 111 could be used to regulate over half of the stationary source emissions, but it would not be well-suited for comprehensive coverage because the number and diversity of sources emitting greenhouse gases is too large. The European Union Emissions Trading Scheme has encountered a similar problem of creating reasonably complete coverage of greenhouse gas emissions; the European Union Emissions Trading Scheme has more limited coverage because that system generally applies where greenhouse gases enter the atmosphere rather than where they enter the economy. The EPA might consider whether Section 111 can be used to regulate upstream from the emissions source (the smoke stack) and nearer to the entry point in the economy (the coal mine, gas head, or oil well). If it cannot, then using Section 111 as a bridge to new legislation could force that legislation to regulate downstream, therefore making the legislation less efficient and more complex than necessary.

Although Section 111 provides flexibility, it also comes with legal risk. The Department of Justice and the EPA have taken the view that Section 111 allows for a variety of mechanisms for reducing emissions – including cap-and-trade – but this particular legal position has not yet been the subject of a court ruling. The next Administration could move forward with a strategy under Section 111 but may find it difficult to provide the certainty, especially over the long run that the market needs to invest in developing and deploying new technologies. Even if courts agree with the EPA that Section 111 can be flexible, the EPA will likely find it difficult to provide the necessary long-term market signal because of the realistic expectation that either the regulations would be modified by subsequent Administrations or that Congress would eliminate or modify the program when it passes a new law.

Principle B: Be Careful: The traditional way in which the EPA has issued regulations under Section 111 has required the EPA to estimate when particular technologies will be commercially available and when they can be deployed at scale. As described above, such estimates are highly uncertain, leading to two possible errors. The first error is the problem that the European Union Emissions Trading Scheme and the Regional Greenhouse Gas Initiative faced: regulators are cautious about the quantity of emissions reductions to require and require less than the market could actually produce. This is also the same error that Congress made in developing the acid rain program. Initial estimates were that reducing sulfur dioxide would cost about \$750 to \$1000 per ton, a price that Congress thought the nation should be willing to pay. The actual price is currently less than \$150 per ton. The federal government now estimates that the benefit of reducing a ton of sulfur dioxide is ten to a hundred times higher than the current cost of doing so. In other words, the acid rain program erred by not allowing for the possibility that emissions reductions would be less expensive and further reductions would have been affordable. This error harms the environment and human health by reducing emissions too slowly.

The second error is less common: Regulators overestimate what is possible and require more than the market can produce at reasonable cost. Many observers fear this has happened with the current Renewable Fuels Standard.

Both of these errors are inherent in a system that specifies a level of emissions reduction based on *projected* cost and technology without making adjustments depending on *actual* cost and technology. Environmental groups often argue that actual costs will be lower than the EPA projects so they should welcome a move towards using actual costs. Similarly industry groups often argue that actual costs will be higher so they too should favor a move towards using actual costs. Unfortunately the EPA may find it difficult to develop the legal theories to support regulations under Section 111 that self-adjust according to actual cost and technology.

Another adjustment that should be considered for greenhouse gases is that of increasing the stringency of the program as our major international trading partners take action. One of the concerns with taking aggressive action today before many of our trading partners do so is the risk of putting certain U.S. industries at a competitive disadvantage. If U.S. firms face the added costs of reducing greenhouse gases before their competitors abroad do, some firms may move some operations overseas. This phenomenon, called emissions leakage, is likely much smaller than most fear but it does increase if there is a large disparity between U.S. climate policies and the policies of our major trading partners. The U.S. could take moderate action without causing concern about emissions leakage and only take additional action when other countries also take action. By keeping the disparity between climate regimes at a low level, this system of acting now but adjusting our actions based on the actions of others avoids a significant leakage concern. This type of mechanism helps to address competitiveness concerns and rewards other countries for taking action. It is far from clear whether the EPA can consider such factors or develop such a system using Section 111.

Principle C: Consider economics of action and inaction: Regulations under Section 111 could be reasonably efficient within a sector by allowing trading,

but would not likely be efficient between sectors unless the EPA developed a novel legal approach to allow for trading across sectors. The efficiency of regulations under Section 111 would also depend on how states handled their role in the regulation of existing sources. For example, if the EPA developed a model-trading rule for states to consider, as it has done in the past, states could choose to auction or give away the rights to emit. Fortunately more and more states appear to now recognize the wisdom of such auctions; auctions avoid granting windfall profits to industry and help states raise money to reduce taxes or for other budget priorities. The EPA itself may have difficulty designing and implementing an auction because Congress has not authorized it to raise money in this circumstance. Since the EPA likely cannot get involved in state-run auctions, the EPA may be forced to allow states the option of giving windfall profits to industry.

New Source Review for Greenhouse Gases

Unless greenhouse gases are listed as a hazardous air pollutants, the EPA will need to develop a New Source Review program for greenhouse gases immediately so that the program can be operational by the time greenhouse gases become regulated pollutants. The Prevention of Significant Deterioration part of the New Source Review program will apply and require the application of what is called Best Available Control Technology for all new or modified sources over fixed size thresholds. Two basic problems could arise from this program. First, the maximum size thresholds for Prevention of Significant Deterioration program are the same regardless of whether the air pollutant is emitted in low volumes like fine particles and sulfur dioxide or high volumes like carbon dioxide. This means that many sources previously designated as small because they emitted a low volume of non-greenhouse gas air pollutants will now be classified as large due to their carbon dioxide emissions. This will increase the number of Prevention of Significant Deterioration permits required. In the recent Advanced Notice of Proposed Rulemaking the EPA has outlined several options for keeping this increase to a minimum at least in the next few years and for streamlining any additional permits that are required.

The second challenge with the Prevention of Significant Deterioration program is that it attempts to differentiate between existing sources and newly modified sources by looking at changes that increase emissions. Companies generally try to avoid making modifications that would be major enough to trigger the Prevention of Significant Deterioration program, while the EPA should be on the lookout for companies that have crossed the line. How and where this line is drawn has been the subject of multiple lawsuits in recent years. Counterintuitively and counterproductively, companies' efforts to avoid making major modifications that would trigger the Prevention of Significant Deterioration program has caused some very old industrial facilities and power plants to remain operational without undergoing regular upgrades. Adding carbon dioxide to the mix will only exacerbate an already bad situation. The EPA had been working on New Source Review reforms designed to reduce the scope of the program, but most of the reforms have been invalidated.

The Clean Air Act: Possible Amendments

Amending the Clean Air Act has never been easy given the complexity of the law and the issues and interests at stake. However there are two amendments that may be able to garner widespread support and could be done in a way that would not open up the Clean Air Act to amendments directed at other pollutants. For a Clean Air Act amendment to get enough support, industry needs to come to understand that the Clean Air Act inevitably will be used to regulate greenhouse gases. It does no good to continue denying this reality or to suggest that Congress would consider a whole-scale preemption of the Clean Air Act without replacing it with new legislation. Environmental groups need to recognize that long-term damage can be done to the public's appetite for climate change policy with only a few well-publicized examples of burdensome or unnecessarily costly regulations. The current Clean Air Act risks providing such an example if the following two amendments are not made.

Increase Thresholds for greenhouse gases

The first amendment would be to increase the Prevention of Significant Deterioration thresholds for greenhouse gases but not for other air pollutants. A reasonable starting point to determine a suitable increase would be to look at how other governments have defined large sources of greenhouse gases. Another approach would be to look at the greenhouse gas emissions of sources that meet the current thresholds for other air pollutants. This would likely lead to greenhouse gas thresholds being increased one-hundred fold although any increase from the current low levels would help the program function better.

Clarify that Greenhouse Gases Are Not Criteria Pollutants

Most observers recognize that a NAAQS for greenhouse gases would not work well. Assuming the next Administration agrees, the EPA can develop legal arguments for why it should not be forced to list greenhouse gases as criteria pollutants under the NAAQS program even if petitioned to do so. However these arguments would be subject to challenge, similar to a legal challenge involving airborne lead that the EPA lost in the 1970s. Since there is no guarantee that the EPA would prevail in declining to list greenhouse gases as criteria pollutants, Congress could simply clarify that greenhouse gases are not to be listed.

The Clean Air Act: Summary

We are fortunate that the EPA can design a regulatory system that will function for greenhouse gases since the Clean Air Act will be used unless Congress acts first. EPA regulations, properly constructed, can be a solid step forward but they alone will not get us where we need to go. The structure of the Clean Air Act is such that greenhouse gas regulations will not be nearly as cost-effective as they could be under new legislation. This will not be a major problem for the first few years of the program because the EPA can pursue greenhouse gas reductions that are inherently very inexpensive or even free. If the use of the Clean Air Act conveys a price premium, realizing these inexpensive reductions will still be well-worth the cost. Any cheap or free greenhouse gas reductions achieved today will offset more expensive reductions in the future for the same cumulative reduction in emissions.

Using the Clean Air Act meets the first principle of acting now and benefiting from our ability to reduce emissions very cost effectively while also setting the market expectation for greater reductions later.

As EPA begins pursuing greenhouse gas reductions that require greater investment, the problems of the Clean Air Act will become more apparent. The EPA must be careful to avoid being overly prescriptive in its regulations, especially as the EPA increasingly relies on technologies that have not yet been commercially deployed or even developed. Clean Air Act regulations should not, and likely will not, rely solely on existing technologies but will also rely on new technologies coming to market. The EPA will need to balance having strong, credible regulations to create the expectation for a future market with the need to remain flexible if certain technologies do not become available in the timeframe originally predicted. The traditional approach to regulations focuses too much on achieving a specified quantity of emissions reductions and will therefore either be too modest or too aggressive. The EPA will likely err in the side of being too modest because the market will likely invent ways of reducing emissions that regulators can not foresee. The Clean Air Act will therefore produce fewer reductions in emissions than would be possible. This error can be addressed with a system of automatically updating the emissions reductions targets based on actual prices and technology development. In the simplest form, this would entail a very aggressive target coupled with a safety valve. Unfortunately it is not clear to what degree the EPA has authority to include such mechanisms in Clean Air Act regulations.

The U.S. currently places no national value on greenhouse gas reductions in most sectors and in almost all regulatory decisions. While we do not know with any precision the value to the globe or even to the U.S. of reducing greenhouse gases, we are virtually certain that it is worth a lot more than the zero dollar price we currently assign. Therefore, the cost of inaction is clearly greater than the cost of action; we are almost certainly doing too little. Moving forward with regulation under the Clean Air Act will reduce this error for many sectors but will likely introduce other deviations from optimal policy. The most obvious way of using the

Clean Air Act is to issue sector-by-sector regulations. Unless the EPA can provide trading or other ways of equilibrating the stringency across sectors, the resulting incentives will likely be greater for some sectors than others.

New Climate Legislation

New climate legislation can be better for the environment and for the economy than the Clean Air Act. This does not mean that the Clean Air Act should not be used; it should and it must be used until Congress acts. When Congress does pass new legislation, it needs, at a minimum, to amend the Clean Air Act in the ways described. More wholesale amendments are likely justified depending on the form of the comprehensive climate legislation. For example, the New Source Performance Standards may become a regulatory backstop and possibly superfluous if new legislation provides a reasonably aggressive national price signal for reducing greenhouse gases. Alternatively, New Source Performance Standards could be used more directly to create incentives for the developers and early adopters of new technologies. It may also be appropriate for Congress to leave in place parts of the mobile source program for similar reasons.

New legislation can achieve goals that will be difficult to provide under the Clean Air Act. New legislation can provide certainty over a much longer timeframe and therefore provide the market signals for technology development. It can also be more responsibly aggressive about promoting and relying on new technology because it can provide safeguards in case technology does not develop as rapidly as predicted. Such a system will create a useful political dynamic of aligning the interests of industry and environmental groups. Both will have an interest in promoting new technology: for industry, because doing so will reduce costs; and for environmental groups, because doing so will generate greater emissions reductions. A simple cap on emissions does not align these interests and is a recipe for ongoing battles over new technologies. New legislation can provide a more uniform price signal with less risk of creating the perception or reality of unnecessary regulatory burden. Legislation can be simpler because it can be economy-wide or at least cover multiple sectors with the same program. It can also be simpler by moving upstream

from the point where the greenhouse gases enter the atmosphere to the point where they enter the economy.

Conclusion

The next President should immediately work with Congress to pass new climate change legislation. At the same time he should authorize the EPA to reengage on regulations under the Clean Air Act. With careful thought, greenhouse gas regulations under Clean Air Act can be made to work. These regulations, properly designed, can build a bridge to new legislation.