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ACCOMPLISHMENTS OF THE CLEAN AIR ACT, AS AMENDED BY THE CLEAN AIR ACT AMENDMENTS OF 1990

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY AND AIR QUALITY

OF THE

COMMITTEE ON ENERGY AND COMMERCE

HOUSE OF REPRESENTATIVES

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ACCOMPLISHMENTS OF THE CLEAN AIR ACT, AS AMENDED BY THE CLEAN AIR ACT AMENDMENTS OF 1990

WESDNESDAY, MAY 1, 2002

HOUSE OF REPRESENTATIVES,
COMMITTEE ON ENERGY AND COMMERCE,
SUBCOMMITTEE ON ENERGY AND AIR QUALITY,
Washington, DC.

The subcommittee met, pursuant to notice, at 10 a.m., in room 2123, Rayburn House Office Building, Hon. Joe Barton (chairman) presiding.

Members present: Representatives Barton, Burr, Whitfield, Ganske, Shimkus, Pickering, Bryant, Buyer, Radanovich, Tauzin (ex officio), Boucher, Hall, Sawyer, Wynn, Doyle, Waxman, Markey, McCarthy, Barrett, Luther, and Dingell (ex officio).

Staff present: Bob Meyers, majority counsel; Joseph Stanko, majority counsel; Andy Black, policy coordinator; Hollyn Kidd, legislative clerk; and Michael L. Goo, minority counsel.

Mr. BARTON. The subcommittee will come to order. The Chair has been informed that Congressman Boucher is on his way. So we are going to begin. The Chair would recognize himself for an opening statement.

Today we begin the Energy and Air Quality Subcommittee's examination of the Clean Air Act issues with a look at the accomplishments of that important environmental legislation.

I participated in the 1990 amendments, had several amendments added to the bill, and voted for the final package. Today I am chairman of the subcommittee with jurisdiction over the Clean Air Act. I also spent, several years ago, 4 years as chairman of the Oversight and Investigations Subcommittee of this Energy and Commerce Committee. During my tenure as chairman of Oversight and Investigations, we held many hearings on the Clean Air Act—I believe the number was 19—and how it was being implemented at the time. Those hearings clearly showed that the Clean Air Act was working to improve air quality.

That is why I am very surprised when I see recent public opinion polls that show that over 60 percent of Americans think that the Nation's air quality is getting worse, not better. Nothing could be further from the truth. The air quality in our nation is considerably cleaner today than it was in 1990.

Nationally, the year 2000 average air quality levels were the best in the last 20 years for all six criteria of pollutants, lead, nitrogen dioxide, sulfur dioxide, particulate matter, carbon monoxide, and

ozone. In fact, according to the most recent EPA figures, between 1970 and 2000, total emissions of the six criteria for air pollutants decreased 29 percent.

During that same time, gross domestic product increased 150 percent, energy consumption increased 45 percent, vehicle miles traveled increased 143 percent, and the United States population increased 36 percent. This is quite an achievement.

Since 1990, an unprecedented number of cities have met the national ambient air quality standards. More than two-thirds of the areas designated as nonattainment following the 1990 amendments are now in attainment and have air quality that meet or surpass the data that is required for them to meet those standards.

These include: Forty-one of the 43 carbon monoxide areas are now in attainment; 69 of the 85 coarse particulate matter areas are now in attainment; and 71 of the 101 1 hour ozone areas are now in attainment.

As one of the authors of some of the 1990 air quality amendments, I am pleased to see that we achieved the results that we have. I want to congratulate the numerous committee members on both sides of the aisle who participated in the 1990 reauthorization.

I hope that our panel of experts today can help inform the 60 percent of the Americans who think that air quality has decreased just what the facts are.

This is just the first in a series of hearings in what should be a bipartisan examination of the Clean air Act. After we finish looking at where we have come, we can next turn to where we should go. It is my hope that this discussion can be calm, cooperative, and constructive. Just as in H.R. 4, the energy bill that we passed in this committee last August and in other legislation, it is my intent to work with members on both sides of the aisle on a fair review process.

Neither Chairman Tauzin of the full committee nor I have made any firm decision about what this subcommittee will legislate on, on this issue in this Congress. If it is the will of the subcommittee members to roll up our sleeves and work together, legislating remains an option, although time is drawing short. At a minimum, I want to build a fact-based record which can be used at the appropriate time to draft legislation to improve the Clean Air Act Amendments of 1990.

With that, I would recognize my distinguished ranking member, Mr. Boucher, for an opening statement.

Mr. BOUCHER. Thank you very much, Mr. Chairman. I want to commend you for scheduling the hearing this morning for the purpose of examining the benefits that have been realized through application of the Clean Air Act and the amendments to that act in 1990.

As the chairman indicated, this is the first in a series of hearings that the subcommittee will conduct on matters relating to air quality across the nation. In 1990 major changes and additions were made to the Clean Air Act. These amendments included the creation of the acid rain program and significant changes to the control of criteria pollutants.

Since enactment of the Clean Air Act and the 1990 amendments, the Nation has made significant progress in reducing pollutant emissions and in improving air quality, at the same time that the Nation's economy and energy use generally have expanded.

From 1970 to 1999, the gross domestic product of the United States increased by 158 percent. During this same period of time, electricity use increased by 148 percent. Despite the increases in energy consumption, our Nation's air today is much cleaner than it was in 1970.

During the past 30 years, sensible environmental regulations, primarily the environmental standards enacted by the Clean Air Act and the 1990 amendments, along with new technology and voluntary actions by the Nation's industry have led to a significant reduction in emissions. Sulfur dioxide emissions have declined by 39 percent. Particulate matter levels have fallen by 75 percent. Airborne lead levels are down by 98 percent, and volatile organic compound levels have decreased by 42 percent.

During the past 3 decades, coal use has increased by 195 percent, while the total emissions per ton of coal consumed have decreased by almost 70 percent. Particulate matter levels from coal based utilities decreased 84 percent between 1970 and 1998. Our Nation's air has been getting cleaner while coal use by electric utilities has steadily increased. These improvements in air quality have been largely due to the success of the Clean Air Act and the amendments adopted in 1990.

The witnesses testifying before the subcommittee today bring a large amount of knowledge to our discussion of the Nation's air quality needs, of the development of the Clean Air Act and subsequent amendments, and the Act's implementation, and I look forward to hearing from each of them regarding the progress we have made in improving air quality over the last 30 years.

I particularly look forward to hearing about the successes of the market based cap and trade strategy under the Title IV acid rain program and to the overall reduction that has occurred in criteria and hazardous air pollutants.

Mr. Chairman, I commend you for beginning this subcommittee's inquiry into the successes of the Clean Air Act with today's hearings, and I look forward to the subsequent hearings and to working with you as we begin to consider changes that could usefully be made in the Nation's clean air laws. Thank you, Mr. Chairman.

Mr. BARTON. I thank the gentleman from Virginia. I would recognize the gentleman from Illinois, the vice chairman, for a 3-minute opening statement.

Mr. SHIMKUS. Thank you, Mr. Chairman. I am delighted to be here this morning, and thank you for holding this hearing.

What we will hear today is how successful the Clean Air Act has been. We will hear how the Act cut thousands of tons of pollution. We will hear that this has been a net positive for our country. Others will say it has not done enough and that we need to do more.

I wanted to bring a copy of a recent St. Louis Post Dispatch where on the same front page it had on the top of the fold "Individual from EPA quits because of business influence." Then on the bottom of the page, it had "Primcorp refinery closes because of high

sulfur rules" and a picture of workers leaving to be unemployed in the future. That is true for all of central and southern Illinois.

The net has been anything but positive of the Clean Air Act. In an area of the country where unemployment rates generally held around 10 percent, the Clean Air Act caused the loss of over 5,000 mining jobs alone, not to mention the other jobs that were lost as a result of the slow downturn in the mining industry.

Congress has just now begun to realize that we can burn coal using clean coal technologies that will result in less pollution. Utilizing these technologies will be a win-win for all in American, especially in southern Illinois. But if we are really concerned about clean air and want to take steps here in Congress to improve clean air, we have the opportunity to do so next week.

This committee passed by a large bipartisan vote legislation to move forward on sending nuclear waste to Yucca Mountain. This legislation will be on the floor next week and, if signed into law, will keep the nuclear energy as an important part of our Nation's energy portfolio, and a diversified energy portfolio is a key to energy independence and energy stability.

Nuclear energy is the cleanest form of energy we have. For example, nuclear generated electricity in Illinois, which gets almost half of our electricity from nuclear power, avoided the emissions of 26.65 million metric tons of carbon, 488,000 tons of sulfur dioxide, and 226,000 tons of nitrogen oxide in 2000 alone.

If other States were to get only 25 percent of their electricity from nuclear power, we would have met all the goals of the Clean Air Act sooner. It seems odd to me that those who claim to be most concerned about the quality of our air are those that are most opposed to nuclear power.

Congress will also have the opportunity soon to pass an historic energy bill that will increase domestic production of energy sources and also provide for a cleaner environment. The Senate version of the energy bill amends the Clean Air Act by creating a renewable fuel standard for gasoline that will result in the use of 5 billion gallons of renewable fuel. Despite what renewable energy critics may say, this single provision will result in over 5 billion less gallons of imported oil being burned, thereby reducing the amount of carbon and sulfur in our air.

The Clean Air Act has done some good, and yet there is still more we can do, but we must take into account the effect Federal environmental regulations have on jobs. I have said the same thing with regard to trade. I have stood up for workers in my district, if I felt trade laws unfairly hurt them, and I consider myself a free trader. I will stand up for workers in my district who are unfairly hurt because of strict environmental regulations. To be honest, southern Illinois cannot handle another Clean Air Act like the one currently in place.

Thank you, Mr. Chairman. I yield back no time.

Mr. BARTON. We thank the gentleman. We recognize the distinguished gentleman from California, Mr. Waxman, for a 3 minute opening statement.

Mr. WAXMAN. Mr. Chairman, 20 years ago this week the Energy and Commerce Committee met in this room to debate amendments to the Clean Air Act. In reflecting about that time, I realize that

only five members from 1982 are still on the committee, John Dingell, Billy Tauzin, Ed Markey, Ralph Hall, and myself.

A lot has changed in the world, in Congress, and on this committee. This room certainly did not have the fancy technology we have today, and Chairman Tauzin was a junior Democrat then. But no matter how long you follow congress, there are some things that do not change.

Twenty years ago industry was fighting to relax the Clean Air Act and, just like they are today, industry lobbyists argued that relaxing clean air rules was key to jobs and economic growth. At the time, we were debating legislation promoted by President Reagan that would have weakened, some say even gutted, the Clean Air Act, because it would have doubled the pollution allowed from cars and trucks and relaxed requirements for nearly all industrial sources of air pollution.

We defeated those efforts, and guess what happened. None of the dire predictions from industry about economic catastrophe came true. Since then, our gross domestic product has doubled. Our population increased by a third, and vehicles miles traveled have doubled, while air pollution in the United States has decreased by 30 percent.

Twelve years ago, we were debating the Clean Air Act amendments of 1990 in this room. Only nine members of the committee who participated in that debate are still here. Once again, the arguments were familiar. Ford Motor Company testified that "We just do not have the technology to comply with the first tier of new tailpipe standards in the 1990 amendments, not even with technology on the horizon."

Mobil Corporation opposed the new Clean Air Act requirements for reformulated gasoline, writing that "The technology to meet these standards simply does not exist today" and predicting major supply disruptions.

The chemical industry said that achieving the required phaseout of CFCs and other ozone depleting chemicals would cause severe economic and social disruption and the Air Conditioning and Refrigeration Institute testified that it was certain that we would see shutdowns of refrigeration equipment in supermarkets; we would see shutdowns of chiller machines which cool our large office buildings, our hotels, our hospitals. But once again, industry was spectacularly wrong.

Once the 1990 law was enacted, industry showed it could meet the new standards ahead of time and at costs far below industry's previous estimates. Now industry is repeating itself again. Led by Haley Barbour, a lobbyist for Southern Company and the former head of the Republican party, industry is claiming that we need to relax the Clean Air Act to maintain economic growth.

Industry is also making a surreal argument that could only be heard here in Washington, DC. They claim that we must weaken the Clean Air Act in order to reduce air pollution.

Mr. BARTON. Approximately how much longer?

Mr. WAXMAN. I only have another paragraph. And as in 1982, the administration is once again taking its cues from industry. While industry lobbyists are asked what they would do if they were

Il Duce, environmental groups, the States and the public are shut out of the process.

Three months after taking office, the President abandoned his campaign pledge to reduce CO_2 emissions, while others in his administration launched a plan to undermine new source review, one of the most fundamental clean air protections in our law.

As we begin our debate today on these assaults on the Clean Air Act, I urge my colleagues to remember what happened in this room 10 and 20 years ago. Twice before, we stood up to industry claims and fought to provide clean air to all Americans. We were right, and industry was consistently wrong. Now is the time to stand up and fight again. Thank you very much, Mr. Chairman.

Mr. BARTON. I thank the gentleman from California. The gentleman from Kentucky, Mr. Whitfield, is recognized for a 3-minute opening statement.

Mr. WHITFIELD. Mr. Chairman, thank you very much, and as we embark on these hearings on the Clean Air Act and, hopefully, for reauthorization next year, I think it is important that we try to look at facts surrounding the Clean Air Act. It is one of those issues that it is politically charged, and a lot of times very loose statements are made without a basis in fact.

I would also recommend to those people interested in this issue two books: One, Greg Easterbrook who is an environmental reporter for the New York Times wrote a book a few years ago, "A Moment on the Earth" in which he goes into great detail about some of the myths relating to carbon dioxide and global warming and so forth. Then another book written by a scientist, Bjorn Lamborg, from one of the Scandinavian countries who was one of the strongest environmentalist activists, and he is a professor. He wrote a book called "The Skeptical Environmentalist," and the New York Times wrote a detailed analysis of this book.

The thing that he stresses in this book is that it is very important that we approach these issues with an open mind in order to avoid big and costly mistakes. I would just like to emphasize once again that this is one of those issues where it is very easy to make all sorts of statements.

Even the models being used to project global warming by the Environmental Panel on Climate Change, and others, recognize that those models are not really accurate and that it is going to be many years before they are truly accurate. But I would recommend that those people interested in this issue read these two books, because I do think they give a more balanced approach to what you normally read on these issues, because generally you read publications totally biased the other way.

So I look forward to these hearings, Mr. Chairman. I look forward to our panels today as we embark on this important work.

Mr. BARTON. I thank the distinguished gentleman from Kentucky. I would recognize the gentleman from Ohio, Mr. Sawyer, for a 3-minute opening statement.

Mr. SAWYER. Thank you, Mr. Chairman, and thank you for holding this hearing. As a consequence of the 1970 Clean Air Act and the 1990 amendments, this country has made enormous progress in improving the quality of air, and I am sure we will hear about that today.

Sometimes it is difficult to measure the benefits of the work that we do in Congress, but the Clean Air Act is a clear example of the public good that can come from legislation. Overall levels of pollution have dropped some 29 percent since the Act. Cars in the 2004 model year will be 99 percent cleaner than those produced in 1970.

Far from crippling the performance of American cars, electronic engine management systems have multiplied performance, multiplied efficiency in the use of fuel, and multiplied our capacity to achieve a cleaner environment. Quite simply, we benefit from the Clean Air Act with every breath we take.

The Clean Air Act demonstrates that this country can achieve the ambitious environmental objectives that it sets for itself. That is why I am disappointed in the direction that we appear to be heading today. The President wants to reduce the ratio of greenhouse gas emissions to economic growth over the next 10 years by 17.5 percent.

That sounds impressive, but what it really means is that the U.S. would still increase the overall amount of greenhouse gases at the same rate that we are today. The President's 17.5 percent target is the same as the 17.4 percent reduction that the U.S. experienced form 1990 to 2000. The plan almost guarantees that we will have much higher emissions of greenhouse gases in 10 years, and we will have done little to address the serious problem of global warming.

We have the technology to develop practical proposals to reduce greenhouse emissions, and we should develop the political will to do it. It would be a legacy to rival that of the original Clean Air Act that we are celebrating. Given that the U.S. emits almost a quarter of the world's greenhouse gases, we cannot afford to be indifferent to global warming. Ultimately, it would be far cheaper to include greenhouse gas controls as a part of a multi-pollutant bill than to leave carbon dioxide controls until later.

Despite its many achievements, the Clean Air Act can be improved, and I am glad that the President's plan recognizes the benefits of a cap and trade program. The acid rain cap and trade program contained in the 1990 amendments has been remarkably successful. If they are designed correctly, these kinds of programs offer great promise to improve our air quality, even more than existing programs.

Astonishingly, the administration has yet to produce detailed evidence to back up its claim that the Clear Skies Initiative will increase air quality and improve public health. I have a sign on the wall of my office that says "Without data, you are just another opinion." At this point, we are largely without data. I hope that the witnesses today can begin to fill in the gaps left while we await the administration's explanations.

Thank you, Mr. Chairman. I yield back.

Mr. BARTON. Thank the gentleman from Ohio. I would recognize the gentleman from Iowa, Mr. Ganske, for a 3-minute opening statement.

Mr. GANSKE. Thank you, Mr. Chairman. A few year ago, I was on a surgical mission to Lima, Peru, and I experienced the worst air pollution that I have ever seen in my life. During traffic hours, you could barely see four blocks.

I am told that part of the reason is that the cars and buses in California that can no longer meet clean air standards are put on ships and shipped down the coast and end up in cities in South America. Lima, Peru is one of them.

Contrast that with Cedar Rapids, Iowa, where you can follow a city bus. The entire city fleet of buses in Cedar Rapids, Iowa, runs on soy diesel fuel, and the black clouds of smoke which are a standard part of bus transit in most cities are no longer there. You don't see choking and coughing from the motorists that are following those buses or the pedestrians on the sidewalk.

Mr. Chairman, renewable energy, be it from wind turbines, solar panels, or hydroelectric dams, is very kind to our air quality. I would be remiss if I did not take this opportunity again to champion the benefits of renewable sources of energy as part of a comprehensive energy portfolio for our nation.

I also know that our current economy does not run on windmills alone, and I look forward to examination of the achievements and challenges facing the Clean Air Act for the future.

I want to again thank all the witnesses for joining us here today and offering their insights, Mr. Chairman. I yield back.

Mr. BARTON. I thank the gentleman from Iowa. We would recognize the distinguished ranking member of the full committee, Mr. Dingell, for a 5-minute opening statement, if he wishes to give an opening statement.

Mr. DINGELL. Mr. Chairman, I thank you, and I thank you for holding this hearing.

Mr. Chairman, I can think of few matters on which this committee has expended more time and more effort and undergone more misery than we did on the Clean Air Act. It is appropriate to examine whether the fruits of this long period of hard work have been borne out in reality. For that reason, this hearing is important.

I think you will find that the very hard work we did in 1970, 1977, and 1990 has resulted in, and will continue to result in, great strides toward cleaner air, while at the same time providing for economic progress.

The record of this committee with regard to that is a remarkable one of having created balanced legislation, jobs opportunity, a good economy, and also the cleanest air in the industrial world. The record, I think, speaks for itself.

Mr. Chairman, the Clean Air Act has always been in the forefront of environmental laws. It touches the lives of all of our citizens and calls for steep sacrifices from virtually every sector of this economy. The consensus we forged in 1970 and again in 1990 reflects the delicate balance between many competing concerns and interests. It is no way easy to achieve, and anyone who believes that the change in this area will come easily should reflect back carefully on the long hours that we spent in this very room prior to final passage of the 1990 amendments.

I am pleased to hear success stories relative to the Clean Air Act. I am pleased the legislation we passed into law has resulted in cleaner air for all Americans, and that in a time of increasing prosperity.

Since 1990, emissions of sulfur dioxide have fallen by 24 percent. Emissions of lead have fallen by 50 percent. Emissions of volatile organic compounds have fallen by 16 percent, and the emissions of carbon monoxide have fallen by 41 percent. This is a record of which we can be proud, especially in a time of great economic and population growth.

The automobile industry, in particular, has made much progress. Cars today are 96 percent cleaner than the uncontrolled vehicles from 30 years ago, and for some pollutants, more than 99 percent cleaner. Today's cars emit fewer pollutants traveling at 55 miles an hour than a 1970 car emitted engine off, sitting in a driveway, and with implementation of Tier II standards required by the 1990 Act, emissions from cars and light trucks will be reduced by another 80 percent from today's clean vehicles.

Before we decide to amend the Act, we should be certain that change is needed, and we should be absolutely certain that the air will be cleaner than when we began, and we should be sure that the ruinous alteration of our industrial base will not accompany such change.

I cannot support any other result. I think we should know beyond question the solutions that we will undertake will result in a better, simpler policy than already exists under the Clean Air Act, and we should be sure that they will result in forward, not backward, movement toward the cleaner and healthier air that the Nation wants.

To undo these provisions without knowing the ultimate outcome is to risk simultaneously the welfare of our citizens and the strength of our economy.

Despite the distinguished panel of witnesses that will shortly appear, we all know of numerous success stories that will not be heard today. The record on this issue will be thus necessarily incomplete, and before we begin to claim that we have examined the question of what has been accomplished since 1990, we should hear from many others on many other topics that these witnesses are not necessarily going to be able to address today.

The clean air amendments of 1990 nearly doubled the size of the existing Act, and they included three new complete titles addressing important topics, such as acid rain, permitting, and stratospheric ozone. Two out of the three of these titles will necessarily remain relatively unexamined in this proceeding, as will many other 1990 provisions, including those relating to fuels and mobile sources from which important success stories can easily be gleaned by any discerning onlooker.

Moreover, no administrative law experts will appear to tell us how our laws have fared in courts. No witness will appear on behalf of State and local authorities. We will not hear from the automobile industry nor from the petroleum industry, nor from the electrical utility industry.

They and many others each have a story to tell. Each have accomplishments. Each have problems. Each have concerns. Each have worries, and each have many positive aspects. Each has a story of substantial accomplishment under the Clean Air Act. We need to give them all a chance to tell it in appropriate future hearings.

There is much to examine and much to learn as we review the Clean Air Act accomplishments that have occurred over the past decade. I look forward to the testimony of witnesses today and those to come.

I do thank you, Mr. Chairman.

Mr. BARTON. Thank you, the gentleman from Michigan. The Chair would like to welcome back to the committee the distinguished former member from California and of this committee, the Honorable Carlos Morehead. We are glad to have him back. You can tell, he has not been a member the last several years. He came in on the minority side. He doesn't realize that, as a Republican, he can now come in over on the majority side. Mr. Hall and Mr. Boucher say he switched. But we do welcome you, Carlos. We are glad to have you back.

We would now like to welcome Mr. Buyer for a 3-minute opening statement. He passes.

We would go to Mr. Markey of Massachusetts for a 3-minute opening statement.

Mr. MARKEY. Thank you, Mr. Chairman, very much. It is so good to see Carlos back here again, and I have very many memories, happy memories of recognizing him on this side of the aisle.

It is a coincidence today, I know, that this hearing is being held on Asthma Awareness Day, and the same day that the American Lung Association reports that 142 million Americans are breathing unhealthy amounts of ozone.

Mr. BARTON. Would the gentleman yield?

Mr. MARKEY. I would be glad to.

Mr. BARTON. We will start your clock again. I want the record to show that Congressman Joe Barton is the original sponsor of Asthma Awareness Day on the Hill, along with Mr. Kennedy when he finally got into the Congress. You know, I am such an evil guy, but I am the original sponsor of the Asthma Awareness Day up here on the Hill.

Mr. MARKEY. Start that clock again. I am going to start it all over again. Thank you.

No one is more aware than you are, Mr. Chairman, of the necessity of clean air than the almost 25 million asthmatic Americans. Over the past two decades, the number of people with asthma has doubled, and the number of asthma deaths has tripled. In 2000 alone, asthma cost our country $12.7 billion, double the amount in 1990. Eight million children have asthma in the United States. Now over the last couple of months, there is the first scientifically demonstrated link between ozone and the development of asthma in children. However, isn't the only concern.

Another recent study involving 500,000 adults in 156 cities nationwide has linked air pollution with an increased chance of developing lung cancer or cardiopulmonary disease. It is as if the people living in the most polluted cities are constantly exposed to secondhand smoke.

The Centers for Disease Control estimates that outdoor pollution contributes to 50,000 to 120,000 premature deaths and $40-$50 billion worth of health care costs.

Now I know the Bush Administration is an anti-technology administration, and they absolutely do not believe in America's abil-

ity to improve its technology. They don't think we can make automobiles more efficient, and they lobby against that. They don't believe that we can make refrigerators or air conditioners more efficient, and they lobby against that. They say it would be too hard for our country to make progress in those areas.

They say it is too hard to make progress in making utilities burn fuel, fossil fuels, and they know that our country can't make the progress on those technologies, and they don't want to burden our country any longer. We have made all the technological progress that we can, they say. But I believe they are wrong.

I think they continue to live in the past. Because of the anti-technology bias of the Bush Administration, I am afraid that our country is looking more to its past than it is to its future, and that is a shame.

A good example is the New Source Review of pollutants. That is when you take an old plant, completely redesign it, like taking old grandma's house, putting on two new wings, putting in a swimming pool, a tennis court, and still wanting to all it the old house. Who does that for a house? They say, come over to my new house. But the utility industry, after putting on the two new wings and the swimming pool, says it's still an old utility. No, don't put us under any new regulations.

In fact, NSR really should stand for "New Source of Respiratory Illness." That is what NSR is in this modern world with all of the new information which we have. Teddy Roosevelt is now being cited by President Bush in his Clear Skies proposal. It makes you wonder what he is thinking, because like the 8 million children suffering from asthma, Teddy Roosevelt——

Mr. BARTON. Can you sum it up in the next 45 seconds?

Mr. MARKEY. Teddy Roosevelt had asthma, and his parents used to take him out into the country where he, in fact, developed his love of the environment and clean air. If Teddy Roosevelt were alive today, he would not be supporting the Clean Skies proposal, because he knows that President Bush's Clean Skies proposal means dirtier lungs for 8 million children, and more in our country who already have asthma.

If it was going to be an updated slogan from Roosevelt for this administration, it would have to be altered to say "Speak softly, and carry a big inhaler" because that is the message that they are sending to 25 million people, including 8 million children who suffer from asthma in our country.

If we continue to allow this to happen, then we are just going to have those Midwestern utilities blowing smoke into the lungs of millions of people, and it is just wrong, and I hope that today's hearing begins to illuminate the real problem that this administration has in dealing with the role that technology can play in making our country healthier. Thank you, Mr. Chairman.

Mr. BARTON. I thank the gentleman from Massachusetts. We recognize the gentleman from Pennsylvania, Mr. Doyle, for a 3-minute opening statement.

Mr. DOYLE. Mr. Chairman, I want to thank you for holding this hearing today so that we can begin to examine this important subject. While we tackle many vital issues here in the committee, there are few as meaningful to all Americans as the air we all

breathe; and while it is certainly as important as any issue we will examine, it is perhaps predictable that it is one of the most complex.

At least one fact seems inarguable. Since the Clean Air Act was established, our air has become significantly cleaner. This seems to be true, regardless of some media reports or conventional witness to the contrary, and I hope that we will today hear some detailed testimony attesting to this fact.

Obviously, this is extremely good news and points out what an important landmark piece of legislation the Clean Air Act was, back when it was first enacted, and how vital it remains today. I think all of us can agree that cleaner air is a laudable goal for many reasons.

It improves everyone's health, both in the short term and the long term. By improving the public's health, we also reduce the cost of health care and health insurance in both the public and private arenas. Clean air also increases our ability to enjoy our natural resources. So, clearly, for the benefit of public health and environment, there is a vested public interest in maintaining and actually improving the quality of our air.

In my district, and in the areas surrounding it through western Pennsylvania, we have struggled with the issues surrounding clean air and the implementation of efforts to achieve it for many years. As someone who has spent his entire life in Pittsburgh, I know that the people there value clean air as much as anyone, and the Clean Air Act has helped us to make great progress in improving our air quality.

Our area was one that labored to create an effective State implementation plan that has now been in place for many years. It has not always been an easy process, by any means, but it was a necessary process that has achieved significant results as we have moved from a moderate nonattainment status to attainment status.

Now, Mr. Chairman, I think we find ourselves at something of a crossroads, not just in Pittsburgh but throughout the Nation, as there are many important questions that need to be answered with regard to the future of our mutual efforts to maintain and increase air quality.

Part of the reason for this has been that it has always been difficult to find effective means for quantifying the progress that has been made. It can also be difficult to adequately demonstrate the problem spots that exist and the actual sources of those problems.

For these reasons and others, there has been substantial controversy in recent years surrounding EPA's effort to promulgate new standards related to clean air, such as those dealing with ozone and particulate matter. I have always been one of those that feels strongly that we should proceed when the science behind the decisions have been effectively demonstrated and adequately verified, and I truly hope that any endeavors we undertake will meet those standards.

As we know, the President has recently begun to outline his Clean Skies initiative, and this is one of the ideas that deserves careful examination. I trust that the administration will work with members of this committee and others as they strive to detail the

finer points of the rather broad framework that has so far been articulated.

In addition, there is an ongoing review being conducted by EPA with regard to New Source Review requirements and their implementation. It is crucial that we determine whether the New Source Review requirements have proven effective, whether they are being enforced in a consistent manner, and how they will affect our Nation's efforts to stabilize our energy supply in the long term.

Mr. BARTON. The gentleman's time——

Mr. DOYLE. Mr. Chairman, thank you for holding this hearing today, and I yield back the balance of my time.

Mr. BARTON. We thank the gentleman. The Chair would now recognize the distinguished gentleman from Rockwall, Texas, Mr. Hall, for a 3-minute opening statement.

Mr. HALL. Mr. Chairman, thank you very much. Of course, today's hearing marks the, I guess, first official act of this committee to reauthorize the Clean Air Act. If the past is any indicator of the future, then this is going to be a long and an arduous endeavor.

Estimates on how long it took to reauthorize the Act the last time which resulted in the 1990 amendments—I'm not sure, but I have heard my friend, John Dingell, say it took 13 years, and I wouldn't attempt to quarrel with the dean of the House, who was then and is now intimately involved in this Act.

I know, as we approached it then, there is only four or five of us, I think, on this committee that were on it at that time, but that was my first year in Congress, and I must say, I was smarter then than I have ever been since. It has gradually gone the other way, but the problems are the same.

I well remember that Mr. Waxman, who was, and still is, a leading member and a very intelligent member and represents his people well—We had problems with Mr. Waxman and Mr. Dingell getting together on a lot of these things. You know, on the tailpipe emissions, for example, we were just logged there and deadlocked and couldn't turn and go either way.

I think we asked these two fine men to go in a room adjacent here and not to come out until they had an answer to the tailpipe emissions. Mr. Dingell had the automobile makers and workers in his district, and Mr. Waxman had the freeways. It just turned out that I had the stationary problems called stripper wells. You can guess which one came out the worst out of that meeting.

Stripper wells were under attack, and I was running from what they called "R to R" then. That is from Reagan to Rostenkowski, to see which one would give me the best deal, and about four or five of us from Texas were working with both of them.

Mr. Chairman, from the standpoint of humor, as I walked into the White House, Mr. Reagan asked me what would it take to get you to vote with my set of rules on clean air, and I said, well, I've got a brother that always wanted to be a Federal judge. He said, well, that should be no problem. He turned to Jim Baker and the Vice President, George Bush then, and said can you get Ralph's brother confirmed? I said, well, wait just a minute, Mr. President, he is not a lawyer.

After that, Reagan and I were friends. He would see me in a crowd and come over to shake hands with me and say how is your

brother. He couldn't think of my name 9 times out of 10, but he knew I had a brother that wasn't a lawyer, and he liked that. But it got to be who could offer me, for my vote on that time, the most exception for stripper wells.

That is not what a lot of you guys hope they are, the type wells you think, but they are small wells by the smallest of all independents that find the energy and then sell it to the majors. But that was very, very important to me.

I know that some of the statistics that these men must remember, and Carlos Morehead remembers that one of the statistics that they argued for passing the Act as it was introduced, and it was a very punishing Act to a lot of industrial thrust at that time——

Mr. BARTON. The gentleman is going to have to tell this story quickly.

Mr. HALL. I will try to be quick with it. One of the statistics was that—I don't know who furnished this statistic, but it always amused me, because they said they had made a national survey, and 82 percent of the people liked clean air. That meant 18 percent didn't care if it stayed dirty. I thought it was a pretty lousy statistic myself.

Mr. BARTON. Those were people in bars in east Texas.

Mr. HALL. I guess so. Didn't know the difference. But in spite of the chairman interrupting me, I want to compliment him on recognizing that this is important for members to be brought up to date, and that long ago we did work together here. There was a lot of give and take. I think we passed the best Act we could pass under the circumstances, but we need to be mindful of the effects of polluted air on human health.

I don't support punishing people with asthma, and I don't think——

Mr. BARTON. You are going to get me in trouble. I have stopped Mr. Markey and Mr. Waxman.

Mr. HALL. And I don't think the President of the United States supports anybody punishing those who have asthma. I think we should support measures to reduce them. However, we need to be mindful of the cost of achieving these reductions and be certain whatever emission reduction regime we implement is the most cost effective available and supported by credible science.

I think there is a line you can hew there and respect both sides. Mr. Chairman, with that, if I can't have another 15 minutes, I will yield back the balance of my time.

Mr. BARTON. We do have a committee rule, though, that all members that were on the committee in 1982 have to stay on the committee until we reauthorize this Act, no matter how long it takes. So that means Mr. Dingell and Mr. Waxman, Mr. Markey and Mr. Tauzin are going to be around, unless you work with us to help reauthorize it very quickly.

Mr. HALL. We are all three willing to stay here 13 years. I know I am.

Mr. BARTON. The Chair would recognize the full committee chairman, Mr. Tauzin, for a 5-minute opening statement.

Chairman TAUZIN. Thank you, Mr. Chairman. I do hope you are all around here for another reauthorization 13 years from now.

Let me first commend you for leading off the Clean Air hearings with an examination of the accomplishments of the existing Clean Air Act and its provisions. I was, obviously, as you pointed out, around in 1990 when we went through an incredible markup process that lasted not only days and weeks and months, but I remember it ended about 4 o'clock in the morning in this very room when we finally came to agreement.

We should all be proud, I think, of what was accomplished in 1990 and thereafter, both Democrats and Republicans, because I think our work helped improve the lives of many Americans, and we will hear about that today.

Regardless of whatever anybody thinks about new or revised Clean Air Act programs or proposals, I think we can all agree that what was done in 1990 has advanced the cause of cleaner air for all Americans very dramatically, and I think the biggest decision that helped us do that was the decision to cap and trade, literally to count on the industry that know best how to run their own systems to figure out how best to achieve the results we wanted, as long as they achieved them and to trade the benefits of their successful programs where it made sense to do so, and to take economic benefit, if you will, from their successes in cleaning the air.

The results have been rather dramatic. I want to mention a couple of them. The acid rain program, for example, is now in its eighth year. The first phase of that program saw annual SO_2 emissions drop by nearly 5 million tons from the 1980 levels. Those reductions were an average of 25 percent below the required emission levels, resulting in a much earlier achievement of human health and environmental benefits that we sought in the program.

The 2001 SO_2 emissions were more than 6.7 million tons below the 1980 levels, and they were achieved at a much lower cost than anybody thought. The early estimates were that it would cost about $5.7 billion per year. We have got the numbers now. It ends up being about a $1 billion to $1.5 billion per year full implementation cost.

Clearly, again the cap and trade system works. It was the combination of the best in our program, saying that you got to achieve good results and, nevertheless, the best in the private sector saying figure out how best to do it; just get there, and get there sooner, if you can, because it is in your economic benefit to do it.

Again, Mr. Chairman, I want to thank you for starting the hearings at this good look at the accomplishments of the Act, because I fully believe that if we understand what went right from the 1990 Act, we can figure out how to make it even better. Thank you, Mr. Chairman.

[The prepared statement of Hon. W.J. "Billy" Tauzin follows:]

PREPARED STATEMENT OF HON. W.J. "BILLY" TAUZIN, CHAIRMAN, COMMITTEE ON ENERGY AND COMMERCE

Let me commend you Chairman Barton for leading off your clean air hearings with this examination of the accomplishments of the Clean Air Act.

Under the Clean Air Act, our nation's air has been getting cleaner, significantly cleaner in many instances—and that is something the Members who participated in the 1990 Amendments, whether Republican or Democrat—should all be equally proud of. Our work has helped to improve the lives of so many Americans, particularly children, as we'll hear today.

Regardless of one's view about new or revised Clean Air Act programs, we all can agree that existing programs have cleaned the air and provided us with implementation information critical to the debate going forward.

Consider, for example, EPA's Acid Rain program. This has been a resounding success, at a much lower cost than first expected. The centerpiece of the program is an innovative, market-based "cap-and-trade" approach to achieve a nearly 50% reduction in SO2 emissions from 1980 levels.

The results of the program have been dramatic—and unprecedented. Compliance with the Acid Rain Program began in 1995 and is now in its eighth year. From 1995-1999, the first phase of the Acid Rain Program, annual SO2 emissions dropped by nearly 5 million tons from 1980 levels. These significant reductions were an average of 25% below required emission levels, resulting in earlier achievement of the human health and environmental benefits we sought with the program. In 2001, the SO2 emissions were more than 6.7 million tons below 1980 levels.

These emissions reductions have been achieved at a much lower cost than anyone expected. In 1990, EPA projected the full cost of the Acid Rain program would be about $5.7 billion per year. Recent estimates of annualized cost of compliance are in the range of $1 to 1.5 billion per year at full implementation. Clearly, emission cap-and-trade programs can achieve cost effective environmental results.

Again, I commend you Chairman Barton for beginning these Clean Air hearings. I know that through such considered examination as we will see today, this Subcommittee's work on this vital issue will add to its history of bipartisan accomplishments, such as the recent H.R. 4 energy bill.

Thank you, and I look forward to hearing from our witness panels.

Mr. BARTON. I thank the gentleman from Louisiana. We would recognize the gentleman from Maryland, Mr. Wynn, for a 3-minute opening statement.

Mr. WYNN. Thank you, Mr. Chairman. I will submit.

Mr. BARTON. Are any of the members present which have not had an opportunity to give an opening statement? Seeing none, the Chair would ask unanimous consent that all members not present have the requisite number of days to put their opening statement in the record in its entirety at the appropriate point in the record. Hearing no objection, so ordered.

[The prepared statement of Hon. Bill Luther follows:]

PREPARED STATEMENT OF HON. BILL LUTHER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MINNESOTA

Thank you Mr. Chairman for holding this hearing today. The Clean Air Act has stood the test of time over the past 30 years and has proven to be one of the most successful and far reaching environmental programs ever enacted by Congress. I believe we should be looking for ways to improve and strengthen public health protections under this historic legislation. I am therefore deeply troubled by reports that the Administration is proposing to eliminate many pollution-control provisions that have been so effective in protecting American families from deadly pollutants linked to lung cancer and heart disease.

The White House proposal calls for an "emissions-trading" plan that, if enacted, would result in the first backward step in the federal government's 30 plus year battle against air pollution. By shifting the focus to total emissions across the nation, the approach avoids individual power plants that are largely responsible for the most serious local pollution problems. Any rational approach to combating air pollution must be able to identify the specific facilities that have contributed to significant declines in regional air quality.

Also, of particular concern to me are reports that the Administration is considering easing standards under the New Source Review Program. This Clean Air Act provision requires power plants to install the most-up-to-date pollution control equipment when they upgrade or expand existing coal-fired facilities. Any relaxation of NSR standards, especially for facilities already "grandfathered" under the Clean Air Act, would almost certainly result in a decline in national air quality.

As this debate continues, I would like to recall the elder President Bush's statement before signing the Clean Air Act Amendments of 1990. He stated, "Every American expects and deserves to breathe clean air. And as, president, it is my mission to guarantee it for this generation and for the generations to come." I think the former President had it right then and I would urge this committee to proceed

extremely cautiously when considering any efforts that would result in weakening this historic legislation that has been so effective in protecting families from harmful pollutants. Thank you.

Mr. BARTON. I would now like to welcome our first witness. We have the Honorable Jeffery Holmstead, who is the Assistant Administrator for Air and Radiation at the Environmental Protection Agency.

You are welcome to the subcommittee. Your statement is in the record in its entirety. We would ask that you elaborate on it in 7 minutes.

STATEMENT OF JEFFERY HOLMSTEAD, ASSISTANT ADMINISTRATOR FOR AIR AND RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY

Mr. HOLMSTEAD. Thank you, Mr. Chairman, and thank you for inviting me to be here this morning. I have to say, I have enjoyed this very much. I would be happy to give some of my time to Mr. Hall. I would have been happy to listen to him.

Mr. BARTON. Don't humor him.

Mr. HOLMSTEAD. I was told that the focus of this morning's hearing would be on the progress that we have made under the Clean Air Act, and that is what I am here to talk about. I couldn't resist, though, just one plug about the Clear Skies Act, and I look forward very much to having the opportunity to talk with you more about that.

I was distressed that Mr. Markey is probably not as well educated by us as he could be, because I know there has been some media reports and a lot of "to-ing and fro-ing" about what that would accomplish, and I think it is fair for all of us to talk about whether that is too stringent or not stringent enough, but the idea that it somehow undercuts the Clean Air Act and fails to protect people is not really credible.

I would invite Mr. Markey or anyone else to talk to any of the hundreds of people in my office who worked on that or the people around the country who implement the Clean Air Act. The one thing we can say with some certainty is it would get substantially greater reductions in air pollution much sooner, much faster, than we will be able to accomplish under the current Clean Air Act.

So with that, I will move along to other thing, but I look forward to telling you more about what we are trying to accomplish with our proposal, and we look forward to working with you on that.

Many of you have already noted the impressive progress we have made and, in fact, you stole some of my statistics. But if I can just show one slide, if we can figure out how to use your new high tech system here. This really tells the story that many of you have tried to tell this morning. All of these lines going up show U.S. growth since 1970, population by more than a third, energy use by about 45 percent, vehicle miles traveled by 145 percent, and the Gross Domestic Product by 160 percent. This growth is really quite dramatic.

While we were experiencing this growth, emissions of the 6 primary pollutants regulated under the Clean Air Act were dropping by nearly 30 percent from 1970 to 2000, and we can say categori-

cally that air quality has improved substantially throughout the country.

This success was made possible by American ingenuity, spurred in large part by legislation that has continued to recognize the importance of healthy air, most recently in 1990 when many of the members in this room worked with others to enact the Clean Air Act amendments of 1990 which gave us important new tools for addressing the major air pollution problems facing the country.

The 1990 amendments grew out of a proposal by President George Herbert Walker Bush that was passed with overwhelming bipartisan support in both the House and the Senate. As many of you have mentioned, some of you were quite involved in that Act and in setting goals for reducing air pollution, goals that we are still striving to meet today.

The current Clean Air Act is, by far, the most comprehensive piece of regulatory legislation that we have in this country, rivaled only by the Internal Revenue Code. It created literally hundreds of State and Federal programs that help us to take aim at air pollution on many fronts.

These programs, as you know, include first and foremost, the national ambient air quality standards to protect public health and the environment from six key pollutants. It also includes national emissions standards for motor vehicles, technology and performance based standards for industry emissions of toxic air pollutants, specialized programs, as many of you have mentioned, to reduce environmental damage such as regional haze and acid rain, and programs as well designed to protect the stratospheric ozone layer.

As we have worked with these programs at the agency over the years, we have learned that it takes a variety of tools to successfully improve air quality, tools ranging from performance standards for motor vehicles to market based programs like the acid rain trading program, and to nonregulatory, voluntary programs that have helped us get substantial reductions in emissions and in energy use.

Our successes are remarkable and, in fact, it would take me hours to go through them all. I promise not to do that, but I do want to highlight just a few. One of our most important accomplishments is helping States to meet the national ambient air quality standards. Although the Clean Air Act gives States the primary responsibility for meeting these health based standards, most can't do it without EPA's help.

EPA assists States both by providing guidance and by issuing the types of regulation that States cannot, such as national motor vehicle emission limits. Under the 1990 amendments, States have made tremendous progress toward cleaning the air in their dirtiest cities. For example, as several of you have mentioned, of the 43 areas designated in 1990 as nonattainment for carbon monoxide, 41 of those 43 have clean air today.

A second important accomplishment and one that has played a key role in our States' clean air success is our progress in reducing motor vehicle pollution. Again, as Mr. Sawyer said, since the 1970's EPA has issued increasingly stringent tailpipe emissions for cars, and by the 2004 model year cars that are sold in that year will be

98 percent cleaner than cars built when the Clean Air Act was passed.

Starting that same model year, 2004, SUVs, minivans and pick-up trucks will have to begin meeting the same stringent emission standards as cars. In addition, in 2007, diesel engine manufacturers must install devices similar to catalytic converters for the first time, and we are also requiring sulfur reductions in fuels.

Combined, these rules will take tremendous steps toward protecting public health, avoiding more than 600,000 asthma attacks every year and nearly 13,000 premature deaths.

The 1990 amendments also called on EPA to make major reductions in the primary pollutants that cause acid rain, including sulfur dioxide or SO_2. We have done that, using a program that has become an environmental showpiece, the acid rain trading program. Under this market based cap and trade program, SO_2 emissions avoided have monetary value, which creates a powerful incentive for emission reduction.

In the program's first 5 years, as Mr. Tauzin mentioned, SO_2 emissions dropped an average of 25 percent further than required by law. As a result, rainfall in the eastern United States is as much as 25 percent less acidic. Some sensitive lakes and streams in New England are showing signs of recovery.

Now again, just a side note, a minor plug for the Clear Skies Act: With the additional reductions in SO_2 and mercury, we would resolve the acid rain problem in the northeast. Our scientists are telling us that the reductions are sufficient enough that the lakes and streams and forests in the northeastern United States would return back to their natural state.

Now I would like to show this other graph that highlights something that Mr. Tauzin mentioned, the kind of efficiency that we get out of a cap and trade program. Compliance with this program is effectively 100 percent. Unlike any other program, we don't have armies of lawyers and inspectors. Each of these plants has a continuous emissions monitor. We know exactly what their emissions are, and we see every year that they are in compliance.

We have not brought a single enforcement action, because of the way it works. It also, as this graph shows, has turned out to be much less expensive than anyone predicted. Estimates in 1990 ranged from $5.5 billion to $7 billion a year. You will see that a few years later GAO did a study suggesting they were more in the neighborhood of $2 billion to $3 billion, based on industry data as well as our own estimates, that it is somewhere between $1 billion and $1.5 billion.

Now one other thing I would like to point out that people don't focus on because it is not nearly as controversial, and that is the success that we have achieved through nonregulatory programs. Let me just show you that even President Bush has gotten involved, posing for a poster encouraging parents to help strike out asthma by pledging to keep their homes smoke free.

The potential environmental and financial benefits of voluntary programs like these is enormous. Take the EnergyStar program, for example. One statistic that I like to use is that Americans spend right now about $1 billion a year just to power televisions and VCRs, but if all of our TVs and VCRs were EnergyStar prod-

ucts, meeting this voluntary standard that we have set would save about half of that total, about $500 million a year.

In the Environmental Protection Agency, we will continue to use our entire suite of tools, and we will look for new ones as we face future air quality challenges. One of the most important challenges on the immediate horizon, and perhaps the most important public health challenge that we deal with in the Air Office, is reducing fine particle emissions.

Last month we cleared the last legal hurdle to implementing new standards for fine particles, often known as $PM_{2.5}$. These are critical standards. The health risks posed by fine particle pollution are the greatest of any air pollutant we regulate today. Fine particles are linked to a number of serious health problems, including chronic bronchitis, heart attacks, and premature death in people with heart and lung diseases.

Based on preliminary data, it appears that approximately 130 U.S. counties did not meet the fine particle standards, and many of these areas will have difficulty meeting the standard without significant regional pollution reductions.

We are just beginning to develop our implementation strategy for $PM_{2.5}$, a strategy that is likely to include a nationwide rule to reduce emissions of SO_2 and NO_X from power plants, one of the largest sources of these pollutants, and we anticipate that yet again we will receive petitions from upwind States seeking additional controls on downwind sources.

We believe the best approach, and the one that will help the most areas meet these standards, is the President's Clear Skies initiative, a market-based cap and trade program patterned after the successful acid rain program. Clear Skies will dramatically reduce power plant emissions of nitrogen oxide, sulfur dioxides, and mercury, protecting public health, improving visibility, and virtually eliminating acid rain.

Over the life of the Clean Air Act, EPA has learned a great deal about how to pick the best tools for addressing our air pollution challenges. Our experience tells us the Clear Skies plan is the single most important step we can take to improve air quality quickly and efficiently.

As I mentioned, I look forward to talking more about that on some future occasion, and I would be delighted to answer any questions that you may have.

[The prepared statement of Jeffery Holmstead follows:]

PREPARED STATEMENT OF JEFFREY HOLMSTEAD, ASSISTANT ADMINISTRATOR, OFFICE OF AIR AND RADIATION, U.S. ENVIRONMENTAL PROTECTION AGENCY

I. INTRODUCTION

Mr. Chairman and Members of the Subcommittee, thank you for the opportunity today to testify on our nation's successes under the Clean Air Act and the work that remains to be done to achieve clean, healthful air throughout America.

More than a dozen years ago, President George Herbert Walker Bush proposed an Administration bill that became the foundation of the Clean Air Act Amendments of 1990. The final legislation passed both the House and Senate with overwhelming bipartisan support, and set challenging goals for reducing air pollution that we are still striving to meet today. The former president, in a Smithsonian exhibit on the presidency, names the 1990 Amendments as one of the three accomplishments of which he is most proud.

And indeed, the 1990 amendments have achieved impressive health and environmental benefits. Since the legislation was enacted, this nation has made great progress in reducing acid rain, meeting health-based air quality standards, protecting the stratospheric ozone layer, and cutting toxic air pollution. Yet we still face major challenges to achieve healthful air, a cleaner environment, and clear skies for all Americans.

In my statement today, I will describe the results we've achieved through Clean Air Act programs enacted to protect public health and environmental quality. I will discuss the tools used to achieve results—what worked and why. One of the most important lessons from the 1990 amendments is how powerful a tool cap-and-trade programs can be for protecting health and the environment. Finally, I will talk about remaining air quality challenges that we face today and our future direction.

II. PROGRESS TOWARD CLEAN AIR

Our progress on cleaning up the air demonstrates that strong economic growth and a cleaner environment can go hand-in-hand. Since the basic structure of today's Clean Air Act was enacted in 1970, we have reduced emissions of six key air pollutants by 30 percent. At the same time, the economy has grown substantially. The Gross Domestic Product increased 160%; vehicle miles traveled increased 145%; energy consumption increased 45%; and the U.S. population increased 35%. This success story was made possible by American ingenuity spurred in large part by legislation that recognized the importance of a clean environment.

Our strong economy has helped us provide cleaner air, which has provided important public health and environmental benefits that far outweigh the costs. For example, lead levels in ambient air are 98% lower than in 1970, greatly reducing the number of children with IQs below 70 as a result of dirty air. The benefits from the programs in the 1990 Amendments alone are impressive. A peer-reviewed EPA study estimates that upon full implementation in 2010, the Clean Air Act programs signed into law by former President Bush will avoid tens of thousands of premature deaths, tens of thousands of cases of acute and chronic bronchitis, tens of thousands of respiratory-related and cardiovascular hospital admissions, and millions of lost work days, among other benefits.

To appreciate how far we have come in reducing air pollution, it is instructive to remember where we were before the 1990 amendments. Acid rain essentially was unchecked, causing damage to aquatic life, forests, buildings and monuments, as well as visibility degradation and health risks from sulfate and nitrate particles. There was growing concern about the increasing damage to the stratospheric ozone layer, which, among other things, protects us from skin cancer and cataracts. In 1990, photochemical smog, which can impair lung function, cause chest pain and coughing, and worsen respiratory diseases and asthma, exceeded healthy levels in 98 metropolitan areas. Many cities did not meet the national air quality standards for the pollutant carbon monoxide, which can aggravate angina (heart pain), and also for particulate matter, which is linked to premature death, aggravation of preexisting respiratory ailments, and reductions in lung capacity. The millions of tons of hazardous air pollutants emitted annually in the United States were largely unregulated at the federal level. Many of these pollutants have the potential to cause cancer or other serious health effects such as nervous system damage.1Since then, the 1990 Amendments have enabled us to substantially reduce each of the major air pollution problems that faced the United States:

- Annual sulfur dioxide emissions, which react to form acid rain and contribute to fine particle formation, have been cut by more than 6.7 million tons, and rainfall in the eastern U.S. is as much as 25 percent less acidic.
- Production of the most harmful ozone-depleting chemicals has ceased in the U.S. and—provided the U.S. and the world community maintain the commitment to planned protection efforts—the stratospheric ozone layer is projected to recover by the mid 21st century.
- Ground-level ozone pollution, particulate matter, and carbon monoxide pollution have all been reduced significantly, producing dramatic decreases in the number of areas in nonattainment.
- Rules issued since 1990 are expected to reduce toxic emissions from industry by nearly 1.5 million tons a year—a dozen times the reductions achieved in the previous 20 years. Other rules for vehicles and fuels will reduce toxics by an additional 500,000 tons a year by 2020.

Reducing Acid Rain

The 1990 Amendments created the Acid Rain Program, calling for major reductions in electric generating facilities' emissions of sulfur dioxide (SO_2) and nitrogen

oxides (NO_X), the primary pollutants that cause acid rain. The Acid Rain Program has been a resounding success, and at a much lower cost than first expected. The centerpiece of the program is an innovative, market-based "cap-and-trade" approach to achieve a nearly 50% reduction in SO_2 emissions from 1980 levels.

The results of the program have been dramatic—and unprecedented. Compliance with the Acid Rain Program began in 1995 and is now in its eighth year. From 1995-1999, the first phase of the Acid Rain Program, annual SO_2 emissions from the largest, highest-emitting sources dropped by nearly 5 million tons from 1980 levels. These significant reductions were an average of 25% below required emission levels, resulting in earlier achievement of human health and environmental benefits.

In 2001, the SO_2 emissions from power generation were more than 6.7 million tons below 1980 levels. NO_X emissions have been reduced by 1.5 million tons from 1990 levels by a more traditional rate-based program (about 3 million tons lower than projected growth). Because the NO_X component of the program is rate-based, however, there is no guarantee that NO_X emissions will stay at these low levels; without a NO_X cap, emissions will increase as power generation increases.

Through the hard work of several federal agencies that maintain interagency environmental monitoring networks (e.g., the National Oceanic and Atmospheric Administration, United States Geological Survey, U.S. Forest Service, National Park Service and EPA)—we know that these emissions reductions are delivering impressive environmental results. Due to the drop in SO_2 emissions, rainfall acidity in the eastern United States has dramatically improved, measuring up to 25% less acidic. As a consequence, some sensitive lakes and stream in New England are showing the first signs of recovery. Further, ambient sulfate concentrations have been reduced, leading to improved air quality and public health, with fewer respiratory illnesses such as asthma and chronic bronchitis. Moreover, the air is clearer, particularly in areas where some of our most scenic vistas are found, such as the Shenandoah National Park.

These emissions reductions and environmental results have been achieved at a much lower cost than anyone expected. In 1990, EPA projected the full cost of implementation of the SO_2 emission reductions would be about $5.7 billion per year (1997 dollars). In 1994, GAO projected the cost at $2.3 billion per year (1997 dollars). Recent estimates of annualized cost of compliance are in the range of $1 to 1.5 billion per year at full implementation.

The cost-effectiveness of the program is tied to the design features of the innovative cap-and-trade approach. The Acid Rain Program was designed to provide certainty that emissions reductions would be achieved and sustained while at the same time allowing unprecedented flexibility in how to achieve the needed emission reductions. This stimulates the use of a variety of emission reduction options, such as fuel switching, installation of control equipment, use of efficiency measures and renewables, and trading among sources. Because the market system places a monetary value on avoided emissions, compliance has stimulated tremendous technological innovation, including efficiency improvements in control technology.

When the Acid Rain Program was designed in the early 1990s, some were concerned about the potential effect of emissions trading on local air quality. Now, in the eighth year of the program, we know that flexibility under the Acid Rain Program has not adversely affected attainment of air quality standards. Independent analyses of the program demonstrate that trading has not created "hotspots," or increases in localized pollution. In fact, the greatest SO_2 emissions reductions were achieved in the highest SO_2-emitting states, acid deposition decreased and, consistent with projections, the environmental benefits were delivered in the areas where they were most critically needed.

The environmental integrity of the Acid Rain Program also can be traced to design features of the approach. The program was developed with unprecedented levels of accountability and transparency. Sources must continuously monitor and report all emissions, ensuring accurate and complete emissions information. All data are publicly available on the internet, providing complete transparency and the public assurance necessary for program legitimacy. Remarkably, sources have registered nearly 100% compliance.

Because of the unprecedented success of the Acid Rain Program, it has served as the model for numerous additional programs to reduce emissions cost-effectively in this country and around the world, including the President's recently proposed Clear Skies Initiative.

Meeting Health-Based Air Quality Standards

Overview

The air in our nation is considerably cleaner than in 1990. Under the Act, EPA has set health-based national ambient air quality standards (NAAQS) for six common pollutants. Nationally, the 2000 average air quality levels were the best in the last 20 years for all six pollutants—lead, nitrogen dioxide, sulfur dioxide, particulate matter, carbon monoxide and ozone.

Since 1990, an unprecedented number of cities have met the health-based national ambient air quality standards. In fact, more than two-thirds of the areas designated as nonattainment following the 1990 amendments now have air quality meeting those standards based on 1998-2000 data, including:

- 41 of the 43 carbon monoxide areas
- 69 of the 85 coarse particulate matter (PM_{10}) areas
- 71 of the 101 ozone areas (one-hour standard)

While air quality improved, the economy showed robust economic growth, increasing 37 percent between 1990 and 2000.

In 1997, based on updated scientific information, EPA set a new standard for fine particles and a revised, 8-hour standard for ozone that is more stringent than the one-hour standard. We have made great progress working with states to get monitoring systems in place for fine particulate matter, or $PM_{2.5}$. Many areas across the eastern U.S. and in California appear to have pollution levels exceeding the 1997 standards.

For the other common pollutants, only a few areas remain in nonattainment. The remaining lead and sulfur dioxide nonattainment areas in the country are the result of localized point sources for which action on an individual basis is being taken. Since 1998, all cities have met the air quality standard for nitrogen dioxide.

Ongoing work to combat ozone pollution

The Clean Air Act gives states the primary responsibility for meeting national air quality standards by developing and implementing state implementation plans (SIPs). EPA assists states by providing guidance, setting national emissions limits for sources such as motor vehicles, and requiring control of upwind sources that contribute to downwind problems in other states.

During the past two years we have reached a major milestone in cleaning up smog in many of our nation's largest cities. In the Northeast, Midwest and South, states have completed plans for attaining the 1-hour ozone standard in all of the metropolitan areas that have pollution levels considered serious or severe under the Act. EPA has fully approved all but one of these plans. The approved plans are for New York City, Springfield, Mass., Greater Connecticut, Baltimore, Philadelphia, Milwaukee, Chicago, Houston and the District of Columbia. EPA has proposed approval of Atlanta's attainment plan. In the near future, we expect to see additional control measures for New York City, Baltimore, Philadelphia and Houston as the states fulfill commitments in their attainment plans.

Houston's ozone attainment plan was developed by the Texas Natural Resources Conservation Commission in partnership with the Mayor of Houston, stakeholders and EPA's Region 6 office. Approved by EPA in October 2001, the plan includes many ambitious and innovative measures. These include a cap-and-trade program setting some of the nation's most stringent limits on NO_X emissions from industry, a fund to accelerate use of cleaner off-road and on-road diesel engines, cleaner diesel fuel, and voluntary measures to reduce transportation emissions. The plan also contains an enforceable commitment to adopt newly emerging strategies needed to cover an estimated shortfall in emissions reductions needed for attainment by the end of 2007. Under a consent decree, the state, in conjunction with industry and academia, is conducting an accelerated review of ozone formation in Houston's skies to consider whether adjustments in the SIP are needed.

Interstate transport of ozone and NO_X, an ozone precursor, is a major contributor to the ozone nonattainment problems across the eastern United States. No state can solve this problem on its own.

As a result, EPA has issued two complementary rules—the NO_X SIP Call and the Section 126 rule—in a combined Federal/state action to reduce interstate ozone transport. The effect of the two rules together is to require NO_X reductions in 19 states and the District of Columbia. EPA anticipates that full implementation of these rules will reduce total ozone-season NO_X emissions from power plants and large industrial sources by approximately one million tons by the 2007 ozone season. This is essential for many of the remaining ozone nonattainment areas to meet the one-hour standard, and will greatly reduce the number of areas exceeding the more-stringent 8-hour standard.

The NO_X SIP Call, which sets emissions budgets for states, and the Section 126 rule, which applies directly to power plants and large industrial sources, both allow for implementation through a market-based cap-and-trade program that allows facilities to choose the most cost-effective means of reducing their pollution. All of the states subject to the NO_X SIP Call plan to use the cap-and-trade approach.

EPA's reliance on existing CAA authorities for addressing ozone transport is working, but three major lawsuits by some states and corporations have delayed implementation. EPA issued the original NO_X SIP call rule in 1998. Both the SIP Call and the subsequent Section 126 Rule set a May 2003 compliance date. However, one court ruling delayed the NO_X SIP call compliance date until May 31, 2004. A second court ruling stopped the compliance clock for electricity generators subject to the Section 126 Rule while EPA responded to concerns the court raised with heat input (fossil-fuel-use) projections for electricity generators, which EPA used in calculating emissions budgets for the two rules. As a result, the two rules were no longer synchronized.

Administrator Whitman on April 23 signed a rule once again harmonizing the compliance dates of the two rules at May 31, 2004. This will facilitate withdrawal of the federal Section 126 program in states that meet the requirements of the SIP Call Rule, and help to avoid potential overlap of the two programs. The Administrator also signed a notice that explains EPA's decision to retain the original heat input projections. In a separate action, EPA recently issued a proposed "phase II" rule responding to other issues from court decisions on the SIP call and Section 126 rules.

Cutting Transportation Emissions

In general, transportation sources contribute roughly half of the overall pollution in our air. The contribution, however, can vary significantly from pollutant to pollutant and from city to city. Note that when I refer to transportation sources I mean all highway motor vehicles as well as diverse types of off-road vehicles and engines. They are major sources of four pollutants, contributing 56 percent of the total U.S. emissions of NO_X, 77 percent of CO, 47 percent of VOCs, and 25 percent of the PM.

Cleaner Vehicles

Cars being built today are well over 90 percent cleaner than cars built in 1970. This is a result of a series of emission control programs implemented by EPA through nationally applicable regulations. Since the first tailpipe standards took effect in the 1970's, there have been increasingly more stringent standards; most recently Tier 1 in the mid-90's; the National Low Emission Vehicle (NLEV) Program, which is in effect today; and Tier 2 standards set to take effect beginning with the 2004 model year. In the Tier 2 standards and most other national vehicles and fuels rules issued since 1990, EPA has provided compliance flexibility through emissions averaging and trading systems.

Tier 2 will take a major step toward reconciling passenger vehicles with clean air. For the first time it holds SUVs, minivans and pick-up trucks to the same emission requirements as autos. Tier 2 is also fuel neutral, which means that gasoline, diesel and alternative fueled vehicles all must meet the same set of standards. Tier 2 is cost effective and its benefits to public health are large—by 2020, over two million tons of NO_X emissions avoided per year, 4,000 premature deaths prevented annually and tens of thousands of respiratory illnesses prevented.

Most large trucks and buses are powered by diesel engines. They can emit high levels of NO_X and PM. Although cars were regulated first, diesel truck and bus manufacturers have had to comply with a series of increasingly more stringent standards beginning in the late 1980's. This Administration has affirmed and is supporting a major new program that has recently been established to protect public health and the environment while ensuring that diesel trucks and buses remain a viable and important part of the Nation's economy. Called the Clean Diesel Program, it begins in 2007, when the makers of diesel engines will for the first time install devices like catalytic converters on new trucks and buses to meet the emission performance standards. The environmental benefits of this program will be substantial. When these cleaner vehicles have replaced the current fleet, 2.6 million tons of NO_X emissions will be avoided every year, 8,000 premature deaths prevented annually, and 23,000 cases of bronchitis and 360,000 asthma attacks. These health benefits far outweigh the cost to produce the cleaner engines and fuels.

The Clean Diesel Program will reduce emissions only from newly produced engines. But there are millions of older diesel trucks, buses and off-road equipment in use today, many of which spew noxious, black soot from their exhaust pipes. EPA has therefore initiated, in cooperation with manufacturers of diesel emission control systems, a major new voluntary initiative to install cost effective emission control

equipment on older diesels. Through this innovative program, the Diesel Retrofit Program, the Agency to date has obtained commitments from businesses and municipalities that own fleets of trucks or buses to retrofit 75,000 vehicles with devices that will reduce exhaust emissions.

Of course, motorists share responsibility to maintain their vehicles properly. Inspection and maintenance (I/M) programs, currently operating in 56 metropolitan areas, are meant to identify polluting vehicles and lead to their repair. Today many states are re-structuring their I/M programs to efficiently incorporate the capabilities of so-called "onboard diagnostic (OBD) systems" that use the vehicle's onboard computer to speed the testing process, provide specific information to the technician to help get repairs done correctly, and maintain or improve the air quality benefits of an I/M program.

Cleaner Fuels

Let me now switch from cleaner vehicles to cleaner fuels. The first effort to address an environmental problem linked to fuel was the multi-year effort to phase down and eventually eliminate lead in gasoline. That successful action was followed by other programs to require oil refiners to produce cleaner gasoline. In the late 1980's refiners began to reduce the evaporation rate of gasoline nationwide during the summer months.

The 1990 amendments to the Clean Air Act established several new clean fuel programs. Much of the nation's progress on carbon monoxide can be attributed to the wintertime oxygenated fuels program, which began in 1992 in 30 cities. The 1990 amendments also established the reformulated gasoline (RFG) program, which was designed to serve several goals, including improving air quality and extending the gasoline supply through the use of oxygenates. Today, roughly 35 percent of this country's gasoline consumption is cleaner-burning RFG. The emission reductions which can be attributed to the RFG program are equivalent to taking 16 million cars off the road.

In two of the programs I mentioned earlier, Tier 2 and the 2007 Clean Diesel Program, EPA recognized the efficiencies of addressing vehicles and fuels as a system when establishing an emissions control program. Thus, in addition to setting strict exhaust emission standards for the vehicles and engines, we also required that cleaner, low sulfur gasoline and diesel fuel be available to enable those emission standards to be achieved. Sulfur is similar to lead in that it degrades the effectiveness of a catalytic converter. This lower sulfur gasoline will reduce emissions from all gasoline-powered highway vehicles, not just those meeting the tighter vehicle emissions standards. The Tier 2 and diesel regulations provide sufficient time for refiners to make the necessary modifications to their facilities before the low sulfur fuel is required. EPA has included a number of provisions that provide additional flexibility to refiners, particularly small refiners.

Off-Road Engines

As emissions from highway vehicles are reduced, the potential for reductions from other sources must be evaluated. Therefore, in 1990 Congress gave EPA new authority to set emission limits for off-road engines and equipment. As a result, EPA has adopted emission control programs for the following off-road equipment: locomotives, marine vessels, outboard recreational boats, and small gasoline engines used in lawn and garden equipment.

The next major category of mobile source emissions to be addressed is large diesel engines used in construction, mining, airport and agricultural equipment. Even though modest emission requirements are in place for this equipment, EPA currently estimates that by 2020 the category will contribute over 10 percent of the total NO_X emissions inventory in a typical metropolitan area and 8 percent of the PM emissions. One of the major issues that needs to be considered is the potential need to lower the sulfur levels in off-road diesel fuel to enable new exhaust control technology to be utilized on future engines. As we found with highway vehicles, this approach of comprehensively looking at the engines and fuel as a system is appropriate here as well. EPA currently is working on a draft proposed rulemaking.

Protecting the Stratospheric Ozone Layer

EPA's Stratospheric Ozone Protection Program has played a landmark role in addressing one of the most pressing environmental issues of our time—the depletion of the ozone layer. We can say with certainty and pride that our effort in the United States to protect the ozone layer is on track toward unqualified success. With the successful worldwide phaseout of ozone depleting substances, EPA estimates that 6.3 million U.S. lives will have been saved from fatal cases of skin cancer between 1990 and 2165, and that up to 300 million cases on non-fatal skin cancer and approximately 30 million incidences of cataracts will have been avoided.

To date, international cooperation to implement the Montreal Protocol on Substances that Deplete the Ozone Layer has led to global reductions in the production and use of ozone depleting substances (ODS), the results of which we can already see. Developed country production of CFCs, methyl chloroform, and carbon tetrachloride essentially ended, except for limited exemptions permitted under the Montreal Protocol, thus avoiding emissions of 400,000 metric tons of ODS. Developing countries as a whole are ahead of schedule in reducing their production, use, and emissions of ODS.

If the world community stays the course, we can expect to see the ozone layer recover in approximately 50 years. The prospect of identifying and solving a global environmental problem of this magnitude, within the span of a single lifetime, is nothing short of amazing. Let me tell you about the success we have had here and abroad.

Here at home, the U.S. is doing its part to ensure the recovery of the ozone layer. Working closely with industry, EPA has used a combination of regulatory, market based (i.e., a cap-and-trade system among manufacturers), and voluntary approaches to phase out the most harmful ozone depleting substances (ODSs). And we're doing so more efficiently than either EPA or industry originally anticipated. The ODS phaseout for Class I substances was implemented 4-6 years faster, included 13 more chemicals, and cost 30 percent less than was predicted at the time the 1990 Clean Air Act Amendments were enacted.

The U.S. has not only "taken care of business" at home but has also played a key leadership role internationally. Through the Multilateral Fund set up under Presidents Reagan and Bush, the U.S. has led the effort toward long term agreements to dismantle more than two-thirds of developing country CFC production capacity and eliminate virtually all of developing country halon production capacity. Sales of US technologies, such as recycling, air conditioning, and refrigeration equipment and about $80 million per year of sales of alternatives to ozone depleting substances have played an important role in this worldwide progress. While the final closing of related facilities depends on continued funding, we are confident that through continued U.S. involvement and investment in this area we will be able to fulfill our international obligations and keep recovery of the ozone layer within our sights.

With continued worldwide vigilance, full recovery of the ozone layer is predicted to occur in 50 years. In the near term, however, exposure to UV radiation and the subsequent health effects of increased incidences of skin cancer and cataracts continues to be a very real problem. One American dies every hour from skin cancer and a mere one to two blistering sunburns can double one's chances of developing melanoma later on in life. With this knowledge, EPA created the SunWise Schools Program to teach children and their caregivers about sun safety. EPA expects to reach children in 17,000 U.S. schools by 2005.

We are proud of these achievements, but the job is not yet done. We have important work ahead of us such as the upcoming domestic phase outs of chemicals like methyl bromide (MBr) and hydrochloroflurocarbons (HCFC) while ensuring that sufficient amounts are available for critical and essential uses. The budget includes $10 million in EPA funding to help replenish the multilateral fund. Without a mechanism for facilitating developing country commitments to phaseout ozone depleting substances, we jeopardize recovery of the ozone layer, investments already made by U.S. industry in alternative technologies, and indeed the lives and health of Americans.

Reducing Risks from Air Toxics

Toxic air pollutants are pollutants known or suspected to present a threat of adverse human health effects such as cancer or birth defects, or adverse environmental effects. In order to control emissions of these pollutants, EPA since 1990 has issued 53 pollution standards affecting 89 industrial categories such as chemical plants, dry cleaners, coke ovens, and petroleum refineries. When fully implemented, these standards will eliminate nearly 1.5 million tons of air toxics and 2.5 million tons of particulate matter and smog-causing volatile organic compounds.

By contrast, in the preceding twenty years only seven hazardous air pollutant standards, eliminating 125,000 tons of toxics, had been put in place. Congress directed EPA to issue technology- and performance-based standards on a source category basis to ensure that major sources of air toxics are well controlled. In essence these standards create a level playing field by requiring all major sources to achieve the level of control already being achieved by the better performing sources in each category.

The result is that we are reducing the large quantities of toxic air pollutants released into our air, in the aggregate and around industrial sources in populated areas. We will achieve additional reductions as we complete standards for more cat-

egories of major pollution sources. This approach is achieving substantial reductions in air toxics, but we recognize that it is not perfect; a drawback is that it focuses on the quantity of emissions while toxic pollutants vary substantially in the risk they pose. Congress gave EPA greater flexibility to target the greatest risks in the second phase of the air toxics program outlined in the 1990 amendments.

We are now in the early stages of implementing this second phase of the air toxics program, targeting particular problems such as elevated risks in urban areas, deposition of air toxics into the Great Lakes, and residual risks from already controlled sources. The underlying goal of this program is to improve air quality at the local, regional, and national levels while minimizing cost and reducing unnecessary burden on states and the regulated community. Achievement of this goal would ultimately result in reduced public risk from exposure to air toxics or other environmental threats.

Virtually all of the transportation-related control programs I discussed earlier reduce toxic emissions as well as emissions of NAAQS pollutants or their precursors. For example, compared to 1990 levels, the programs we have in place today for highway vehicles, including Tier 2 and the 2007 diesel rule, will reduce emissions of four gaseous toxic pollutants by about 350,000 tons by 2020, a 75 percent reduction. Diesel particulate matter (PM) from highway vehicles will be reduced by 220,000 tons over the same time frame, for a 94% reduction.

Improving Visibility in our National Parks and Wilderness Areas

Having lived a good portion of my life within sight of the Front Range, within an hour of Rocky Mountain National Park, I have a personal appreciation for the importance of protecting the beautiful vistas of our great land from visibility degradation.

Haze, created by fine particles and other pollutants, often degrades visibility across broad regions and obscures views in our best known and most treasured natural areas such as the Grand Canyon, Yosemite, Yellowstone, Mount Rainier, Shenandoah, the Great Smokies, Acadia, and the Everglades. Despite improvements in recent years in some areas, visibility remains significantly impaired. In eastern parks, average visual range has decreased from 90 miles (natural conditions) to 15-25 miles, and on some days, visibility is less than 10 miles. In the West, visual range has decreased from 140 miles to 35-90 miles. Visibility for the worst days in the West is similar to days with the best visibility in the East.

In July 1999, EPA published a long awaited regional haze rule that calls for long-term protection of and improvement in visibility in 156 national parks and wilderness areas across the country. Because haze is a regional problem, EPA has encouraged states and tribes to work together in multi-state planning organizations to develop potential regional strategies for the future. Five of these regional planning organizations are now operational. EPA will be working closely with these organizations to provide guidance during this process, just as it did with the many states and tribes involved in the Grand Canyon Visibility Transport Commission.

Over the next several years, states are required to establish goals for improving visibility in each of these 156 areas and adopt emission reduction strategies for the period extending to 2018. States have flexibility to set these goals based upon certain factors, but as part of the process, they must consider the rate of progress needed to reach natural visibility conditions in 60 years. To assist in evaluating regional strategies and tracking progress over time, we have continued to work with the states and federal land managers to expand our visibility and fine particle monitoring network to 110 of these areas. One of these regional planning organizations is the Western Regional Air Partnership, or WRAP. The regional haze rule specifically takes into account the WRAP's efforts to develop and carry out a strategy for improving visibility in 16 scenic areas in the western United States. Currently, EPA is proposing to approve, and to incorporate into the regional haze rule, an element of this strategy that addresses stationary sources of sulfur dioxide. The WRAP's innovative approach establishes regional sulfur dioxide emissions targets, gives Western sources the opportunity to meet these targets through voluntary measures, and provides for an enforceable backstop emissions trading program that will ensure that the targets are met if the voluntary measures do not succeed.

EPA is moving forward to issue process guidelines for states to follow in implementing the Act's requirement for "best available retrofit technology," or BART, at certain older facilities that have been grandfathered from new source requirements under the Act. These older facilities emit large amounts, in the millions of tons, of visibility-impairing pollutants. For many, cost-effective control measures are available. EPA proposed these BART guidelines in July 2001 and we are looking to finalize them later this year. These guidelines will help States identify facilities subject to BART, and available methods for reducing their emissions.

III. TOOLS FOR SUCCESS

This history of clean-air success in concert with strong economic growth has been achieved through extensive stakeholder consultation, partnership with states, and use of a combination of tools that fit the range of air quality problems we face. Among these tools are national health-based standards, emissions limits, information, trading and economic incentives, voluntary programs, and hybrid approaches.

Most of these tools and approaches were regarded as innovative in 1990 when the Clean Air Act Amendments were passed, but today these are part of EPA's normal way of doing business. Today we are continuing to learn from experience and to improve air quality through regulatory and non-regulatory strategies. Three areas of emphasis include stakeholder consultation, market-based approaches and non-regulatory approaches.

Regulatory Tools

Increased Stakeholder Consultation

Perhaps the most visible of the new approaches adopted following the 1990 amendments is the early and continuing use of consultation as we develop regulations. Since then, the Agency has dramatically expanded its interaction with stakeholders. Consensus is not always attainable, of course. But the time and effort we put into communication and consensus-building pays off in better rules, and often in smoother implementation.

One of the first examples of stakeholder involvement was the Acid Rain Advisory Committee, an intensive seven-month effort with stakeholders immediately after the 1990 Amendments that helped shape the rules for the successful acid rain program. This positive experience led to establishment of the Clean Air Act Advisory Committee, a standing group of several dozen experts from industry, the environmental community, states, academia and elsewhere. We seek the advisory committee's insights frequently.

EPA also establishes stakeholder advisory committees to advise us on specific air program issues as they develop. One example is a diverse stakeholder committee currently reviewing questions concerning our recently issued rule to reduce levels of sulfur in diesel fuel.

In addition to these formal processes, we have also engaged stakeholders in substantive, early discussions on many significant rulemakings long before they reach the proposal stage—for example, in developing rules to control emissions from heavy-duty trucks and buses. The National Low Emission Vehicle Program is another example of what can be achieved through consensus building with stakeholders when incentives for agreement exist.

Trading and Market-based Regulatory Programs

The second major reason for clean-air success over the years has been EPA's pioneering use of innovative, market-based regulatory approaches. EPA is proud of our increasing reliance on market-based tools, particularly cap and trade programs, to cut compliance costs, promote technology innovation and achieve early and extra environmental benefits.

Perhaps the most important lesson from implementing the 1990 amendments is how powerful a tool cap and trade programs can be for protecting health and the environment. When the acid rain legislation was under development, the proposal for a cap-and-trade approach was new, untested, and met with much skepticism. Many questioned whether it would deliver the promised environmental protection, whether the trading system would operate as advertised, and whether costs would be reasonable. Today, it is clear that the answer is a resounding "yes."

The acid rain trading program, because it was properly designed, has demonstrated many advantages relative to a command-and-control approach. The acid rain cap and trade program achieved reductions at two-thirds the estimated cost of achieving the same reductions without trading. The cap and automatic penalties for noncompliance ensure that the environmental goal is achieved and maintained. Trading and banking have allowed companies flexibility to choose compliance options and minimize costs. In 1990 EPA estimated that the price of an SO_2 allowance (representing one ton of reduction) would be $625 in 2000 (in 2000 dollars) and some in the utility industry speculated that the price could be much greater, in the range of $1,500. In fact, the actual price of SO_2 allowances in 2000 was $150. The cap-and-trade system has created financial incentives for electricity generators to look for new and low-cost ways to reduce emissions, and to do so earlier than required by law. As mentioned above, reductions in the early years averaged 25 percent below the required cap, resulting in early health and environmental benefits. The program has high accountability and transparency; electricity generators must

have continuous emissions monitors to prove they have sufficient allowances to match their actual emissions. The cap-and-trade system also has other advantages: The acid rain program enjoys nearly 100 percent compliance and only takes 75 EPA employees to run, and avoids lengthy permit reviews.

As I have mentioned, EPA is using this now-proven approach to address other significant problems such as regional ozone transport, and believes this approach should be the cornerstone of an integrated multi-pollutant approach toward future reductions in power plant emissions.

Beyond these flagship programs, EPA also continues to apply market principles more generally to find innovative ways to achieve more environmental protection at less cost. We have had great success with the emission trading program to protect stratospheric ozone, and we have provided averaging, banking, and trading opportunities in many national air rules for such industries as vehicle manufacturers and fuel refiners. Emissions averaging is also incorporated in national air toxics emissions standards for refineries, chemical plants, aluminum production, wood furniture and other sectors that use paints and coatings. We also have used other methods, including multiple compliance options, to help provide flexibility in air toxics rules.

In addition to providing flexibility in national rules through trading and other means, EPA is working with states to promote other flexible approaches to help achieve national air quality standards for smog, particulates and other criteria pollutants. These approaches—including broader use of trading programs and voluntary measures in State Implementation Plans—are becoming valuable alternatives in many areas where conventional approaches are reaching the limits of what can be achieved.

Improvements in Analytical Tools

Since 1990 we also have seen improvements in analytical tools that enhance our ability to analyze the benefits, costs and cost effectiveness of potential strategies to reduce air pollution. These tools help inform our policy and regulatory decisions.

These improvements have been achieved through dramatic increases in the quality and comprehensiveness of data used as inputs to our analyses and the speed and accuracy of the modeling systems used to analyze those data. Specific examples of these improved data sets and modeling tools include a new integrated criteria pollutant and hazardous air pollutant emissions inventory system called the National Emission Inventory (NEI); a significantly expanded fine particle monitoring network; a new, third-generation air quality modeling system called Models-3 which incorporates the new Community Multiscale Air Quality (CMAQ) model capable of integrated assessment of changes in tropospheric ozone, acid deposition, particulate matter, and visibility across the coterminous 48-states; and an integrated health effects and economic valuation modeling system called the Criteria Air Pollutant Modeling System (CAPMS).

EPA analyses have also benefitted greatly from major strides in the public health and economic literatures related to estimating the effects of air quality improvements. Important examples include the Health Effects Institute (HEI) re-analysis of key PM mortality epidemiological studies and the development of dozens of new studies estimating the economic value of reductions in risk of premature mortality. All of these represent just a few examples of the many improvements in relevant literature, information systems, and analytical technologies achieved by EPA and our partners since 1990.

Non-Regulatory Tools

One important lesson we've learned over the last 12 years is how much environmental protection we can accomplish without regulating. We've had great success by giving people the information they need, working with them, and helping them work with each other to address pollution problems in their communities and businesses. EPA has a number of information-based or voluntary programs authorized by the Clean Air Act or funded through Clean Air Act grants.

EPA has developed several partnership programs with industry that were either explicitly laid out in the President's National Energy Policy, or are otherwise consistent with the policy direction therein. These include several new Energy Star efforts, Climate Leaders, the Combined Heat and Power Partnership, the Green Power Partnership, and Commuter Choice Leadership Initiative. Other voluntary partnerships with nonprofit organizations have fueled effective public outreach programs such as Tools for Schools, the Smoke Free Homes Pledge, and the "Fish Out of Water" asthma ad campaign.

Energy Star and Related Partnerships

In many cases, EPA has found that voluntary, information-based approaches are most effective when carried out in partnership with industries. Perhaps the most impressive example of this is the Energy Star program, which offers businesses and consumers energy-efficient solutions that save money while protecting the environment for future generations. The Energy Star program establishes national definitions for efficient products, homes and buildings that qualify to use the widely recognized Energy Star logo. It has succeeded in creating a national platform for efforts by manufacturers, governments and other partners to increase energy efficiency. In 2001 alone, the Energy Star program reduced energy consumption by 80 billion kilowatt hours, offset more than 10,000 megawatts of peak power, prevented 140,000 tons of nitrogen oxides emissions, and reduced greenhouse gas emissions by more than 16 million metric tons of carbon equivalent—the same as eliminating the emissions of 10 million cars. American businesses and consumers, with the help of Energy Star, are saving about $5 billion a year on their energy bills.

Building on our experience with Energy Star, we are now developing a series of additional partnership programs to provide significant energy savings and reduce emissions of NO_X, VOCs, and greenhouse gases. The first of these is the Climate Leaders program, a government-business partnership that helps companies effectively manage their greenhouse gas emissions by providing them with new management tools and recognizing them for their success. In this program, companies pledge to achieve company-wide emission reductions in greenhouse gases over the next 5 to 10 years, and report on their progress. Two other partnership programs, built around energy production, are the Green Power Partnership and the Combined Heat and Power Partnership. These new voluntary programs are designed to reduce the environmental impact of electricity generation by promoting renewable energy and energy-efficient technology through technical assistance and public recognition.

Asthma Education

EPA has also taken a voluntary, information-based approach in helping to combat asthma, a disease which has grown to epidemic proportions in the United States, and one which is often triggered by indoor air pollution. While scientists do not fully understand what has caused the rise in asthma, outdoor air pollution and environmental contaminants commonly found indoors are known to trigger asthma attacks and in some cases, can even lead to the development of new cases of asthma. In response to this epidemic, EPA has joined with other Federal agencies including the Department of Health and Human Services and non-profit health organizations, to step up the national fight against asthma. With pro-bono help from the Advertising Council, in 2001 we launched a multimedia public-service advertising campaign to raise public awareness of the need to reduce exposure to indoor environmental triggers as part of a comprehensive asthma management plan. In the first six months of the campaign, we utilized over $30 million worth of donated media exposure in the form of TV, radio, and print advertising. EPA's program also is supporting other direct asthma education initiatives in schools, day-care centers, primary health care clinics and managed care organizations to promote comprehensive asthma management including preventing exposures to indoor environmental triggers.

Indoor Air: Tools for Schools

Beyond its asthma efforts, EPA also has applied voluntary, information-based approaches to indoor air quality problems more broadly. One especially important site where poor indoor air quality often causes health problems (including asthma) is the schoolroom. To help educators and the public make their schools more healthful for children and faculty, EPA has developed an Indoor Air Quality "Tools for Schools" (TfS) Kit to prevent or correct common indoor air quality problems. More than 9,000 schools across the US have voluntarily adopted the operation and maintenance practices in the TfS, and we are gaining momentum: the Chancellor of the New York City School System (1,200 schools serving 1.1 million children) has declared that all schools in NYC will implement TfS by the 2005-2006 school year. Several states have incorporated the key concepts into requirements for all their schools. EPA is placing special emphasis on promoting implementation of this voluntary guidance in states with large student populations. Texas, Florida, New York and California account for 32% of the students in the US.

Environmental Tobacco Smoke

Another serious indoor air problem is secondhand tobacco smoke, which causes hundreds of thousands of excess lower respiratory tract infections in young children each year, increases their risk of middle ear infections often requiring hospitalization, and worsens the condition of a million children with asthma. EPA is using a

voluntary approach to address this serious issue through a sustained campaign to educate and motivate parents to protect their children by making their homes smoke-free. The initiative includes an award-winning national television, print, and radio media campaign which has resulted in over $15 million of donated air time.

AIRNow Program

In addition to these indoor-focused programs, EPA has also used voluntary, information-based approaches to help address outdoor air quality problems. To help citizens understand and make decisions about their own personal exposure to high ozone levels, EPA has developed the AIRNow program which includes a web site to provide the public with easy access to air quality information, both local and national. Through the web site and national media, AIRNow provides daily air quality forecasts as well as real-time air quality for over 100 cities across the United States. AIRNow is one of the first environmental programs to deliver real-time data to the public in an easily understandable, color-coded, graphical format, similar to the color-coded warning program for homeland security. The animated air quality map and air quality forecasts give the public information they can use to make daily decisions about the air quality in their area. AIRNow also goes beyond the Internet to reach the broader public, with USA Today featuring AIRNow air quality forecasts and TV stations incorporating it into weather forecasts on national programs like the Weather Channel as well as local programs. Over the next several months, the program will be expanded to address particulate matter.

Commuter Choice

A new business-government partnership, called the Commuter Choice Leadership Initiative, focuses on reducing vehicle emissions and improving the way people get to and from work. EPA and DOT assist participating employers by offering technical assistance, public recognition, training, Web-based tools, and forums for information exchange. To participate, employers make a series of commitments, including ensuring a minimum level of employee participation and offering a series of commuter benefits. In return for offering these benefits, employers can reap the important benefits of helping to attract and retain employees, reduce the demand for limited or expensive parking, and exhibit leadership and corporate citizenship. Almost 300 companies, employing over 750,000 people, have joined the program since it was launched last year.

Community-Based Programs

Some of EPA's most innovative work comes by working with people in their communities at the local level. For example, the Ozone Flex program, started last year in Texas, offers increased regulatory flexibility to encourage state, local and tribal governments to make voluntary, early reductions of air emissions that form ground-level ozone. Another community-based program, the Cool Cities initiative, shows local governments how to reduce the polluting effects of heat buildup in cities, and offers them regulatory credit for doing so. This program began in Houston, Texas, and we hope that other cities will follow Houston's lead and also join the Cool Cities program.

Another important new initiative is the Cleveland Air Toxics project, which is setting the stage for a new way to solve the problem of urban air pollution. We have assembled a group of community leaders who are building a sustainable, results-focused project that is a model for the entire nation. And the Cleveland pilot, for the first time, integrates our work across stationary, mobile, and indoor pollution sources. The approach bridges organizational barriers here at EPA and allows the community to address the issues they believe have the most impact on their lives.

IV. TODAY'S CHALLENGES

Reducing Fine Particles and Smog

Two of the greatest air quality challenges facing us today are reducing levels of fine particles and ground-level ozone (smog) to meet the more health protective air quality standards EPA issued in 1997 based on an exhaustive review of new scientific evidence on effects of these pollutants. Fine particles and 8-hour ozone levels appear to be of concern in many areas of California and across broad regions of the eastern United States.

On March 26, after years of litigation and a favorable Supreme Court decision, the U.S. Court of Appeals for the D.C. Circuit rejected all remaining legal challenges to both standards. The Administration vigorously defended the standards before the court.

As Administrator Whitman said last month, the court decision "is a significant victory in EPA's ongoing efforts to protect the health of millions of Americans from

the dangers of air pollution. EPA now has a clear path to move forward to ensure that all Americans can breathe cleaner air." Now EPA will work in partnership with state, tribal and local governments to implement those standards.

We believe that fine particles pose the greatest public health risks of any regulated air pollutant. Fine particles are associated with tens of thousands of premature deaths per year in people with heart and lung diseases. Fine particles aggravate heart and lung disease, leading to increased hospitalizations, emergency room and doctor visits, use of medication, and many days of missed school and work. Fine particles have also been associated with respiratory symptoms such as coughing and wheezing and chronic bronchitis, as well as heart beat irregularities and heart attacks. And fine particles are a year-round problem.

Ozone smog also is a significant health concern, particularly for children and people with asthma and other respiratory diseases who are active outdoors in the summertime. Ozone can cause increased transient respiratory symptoms, such as coughing and pain when breathing deeply, as well as transient reductions in lung function and inflammation of the lung. Ozone has also been associated with increased hospitalizations and emergency room visits for respiratory causes. Repeated exposure over time may permanently damage lung tissue.

We are determined to move expeditiously to achieve the health benefits of the standards. However, there is some preliminary work that must be completed before we can designate areas under the new standards, which starts the clock on many implementation requirements.

Before the $PM_{2.5}$ nonattainment areas can be designated, three years of data are needed to determine whether an area is not attaining the standard. We will have 3 years of quality-assured data beginning in the summer of 2002. It is difficult to project a precise schedule for designating $PM_{2.5}$ nonattainment areas, but I have asked my staff to determine how we can move forward expeditiously in light of the public health threat posed by fine particles. The Transportation Equity Act of 1998 requires states and EPA complete the process within two years after three years of monitoring data are available, or no later than December 31, 2005. Based on a preliminary two-year data set from 250 counties, more than 130 areas are expected to violate the annual standard. About 100 of these areas also appear to be not attaining the 8-hour ozone standard, and it will make sense for states to consider both ozone and PM in devising attainment strategies.

As we work with the states on fine PM designations, we also will be working with our governmental partners and stakeholders to develop an implementation strategy. In the East, high $PM_{2.5}$ levels are attributed to regionally high sulfate and nitrate concentrations (primarily from power plants and motor vehicles) combined with local urban emissions of other pollutants. President Bush's Clear Skies Initiative to cut emissions from power generators through a cap-and-trade program can substantially reduce the number of areas with unhealthy levels of fine particles. Regional strategies and/or national rules should be the first step toward addressing sulfates and nitrates, particularly in the East. A number of already-adopted mobile source programs, such as Tier II standards for cars and light trucks, reduced sulfur in fuel, and standards for new heavy duty diesel engines, will also help reduce local emissions. However, additional local strategies will need to be developed for certain cities to address their particular mix of emissions sources also contributing to the problem. For example, a diesel engine retrofit program (e.g. for buses) appears to be one obvious local action that cities can take to protect the public from $PM_{2.5}$ health effects now.

8-Hour Ozone

We are actively working on several fronts to prepare the way for implementation of the 8-hour ozone standard. Because the Supreme Court ruled that EPA's original implementation strategy was unlawful, EPA is working with state and stakeholders to develop a new approach that will be adopted through rulemaking. The new approach will be proposed this summer and finalized a year after its proposal. We also are working to complete our response to the May 1999 remand from DC Circuit court concerning UVB radiation, and anticipate a final rule this year. EPA plans to designate areas for the 8-hour ozone standard no earlier than the end of 2003.

There are over 300 counties measuring exceedances of the 8-hr ozone standard. Existing EPA programs, including national motor vehicle programs and the NO_X SIP call, are projected to help many of the new nonattainment areas meet the standard over the next few years. States and localities also will need to do their part to reduce emissions from local pollution sources.

Cost-effective strategies and technology advances

Under the Clean Air Act, both EPA and the States have responsibilities for developing regulations requiring pollution sources to reduce their emissions to help attain air quality standards. In both cases, cost is a key consideration, helping determine which pollution sources should reduce emissions, by how much, and on what timetable. As mentioned above, EPA develops national emission standards for large sources such as automobiles, powerplants, and factories. These rulemakings consider costs in a number of ways, from broad economic-impact studies to more specific analyses of impacts on states, localities, and small businesses. Costs are also a central consideration to states and localities as they design their state implementation plans to achieve the additional reductions needed beyond those provided by EPA's rules. EPA works closely with regulated communities to obtain information on currently available and emerging control technologies and their estimated costs. EPA uses this information in developing its Federal rules, and it also makes such information available to states, localities, and industries to assist them in their planning.

A word should be said here about technological innovation and its role in projecting future costs of pollution control. As is the case for technology generally, air pollution control technology is developing so rapidly that it is difficult to predict very far into the future. We know based on experience that technological advances over the longer term will provide substantial help in meeting clean-air goals. But it is inherently difficult to estimate the amount of emissions reductions and cost savings that will be available five, 10, or 15 years from now through technological advances in numerous industries—including advances that are entirely unforeseen today.

Our experience over the past 30 years, and the promise of cleaner technologies emerging today, strongly suggest that technological innovation will continue to produce new, cleaner processes and performance improvements that reduce air pollution at reasonable cost. The Clean Air Act itself has spurred such advances, as innovative companies have responded to the challenges of the Act with great success, producing breakthroughs such as alternatives to ozone-depleting chemicals and new super-performing catalysts for automobile emissions. We are continuing to promote such innovation through emission-reduction strategies that set clear emissions goals and then provide flexibility on the means of achieving them—for example, through the kind of market-based approach in the President's Clear Skies proposal.

Protecting Our Environment and Resources

The same emissions that form fine particles and ozone, causing public health risks, also contribute to environmental and resource damage. One example is visibility degradation, which I already have discussed.

In addition, modeling results and recent studies of ecological response to emissions reductions under the Acid Rain Program indicate that Title IV is moving us in the right direction, but not far enough. For example, scientists in the Shenandoah National Park discovered the first observed disappearance of a fish population due to acidification. Researchers in that region claim that reductions of sulfate deposition of 70 percent or greater from 1991 levels are necessary to prevent further acidification of Virginia brook trout streams.

A recent assessment of acid deposition and its effects in the northeast by the Hubbard Brook Research Foundation reflects a similar finding. Researchers found no significant improvement in lake and stream water quality in the Adirondack and Catskill Mountains, even following recent decreases in acid rain. The study concluded that full implementation of the 1990 Amendments will not result in substantial recovery in acid-sensitive ecosystems in the northeast. Instead, it concluded that further reductions of SO_2 emissions from power generation are necessary to achieve recovery of aquatic ecosystems in this region.

Recent studies also demonstrate that nitrogen deposition is an increasing concern in many regions of the country. For example, EPA's recently released national coastal condition report found deteriorating water quality in many areas of the eastern U.S. and Gulf Coasts, much of it due to increasing nitrogen pollution. Other researchers have found symptoms of "nitrogen saturation" in forest ecosystems in diverse areas of the country, including the Front Range of the Colorado Rockies, forests in southern California, and forests along the Appalachian Mountain chain of the eastern U.S. As a result, forest soils lose nutrients, forests are less productive, and streams and lakes continue to get more acidic.

Taking into consideration the ongoing concern about acid deposition, President Bush's Clear Skies Initiative would address these problems by cutting emissions of SO_2 and NO_X from power generators through a cap-and-trade program.

Air Toxics Challenges

Two important air toxics challenges are elevated risks from the multiple toxic pollutants emitted into urban airsheds, and health risks from mercury, a persistent toxic substance that accumulates in the food chain.

Urban Air Toxics Strategy

Air toxics can pose special threats in urban areas because of the large number of people and the variety of sources of toxic air pollutants. Individually, some of these sources may not emit large amounts of toxic pollutants. However, all of these pollution sources combined can potentially pose significant health threats. Under the Clean Air Act, EPA is required to develop an Integrated Urban Air Toxics Strategy that addresses air toxics in urban areas, looking collectively at emissions from large and small industrial and commercial operations, on-road and off-road vehicles, as well as indoor air sources. We are also concerned about the impact of the toxic emissions on minority and low income communities, which are often located close to industrial and commercial urbanized areas.

We will also assist State, local, and tribal agencies in making their own assessments and decisions on risk strategies by providing them tools, guidance, and training, while continuing to develop national standards. We are also exploring new approaches for identifying flexible, less expensive methods for reducing emissions. In addition, to better understand local risk, we will collect and analyze data from ongoing community projects to provide a centralized information database. We will also continue to participate in projects such as in Cleveland, Ohio. This integrated approach will allow EPA and state, local, and tribal governments the ability to cooperatively address specific risks and administer direct and cost efficient controls in specific "hot spots" or target areas.

Mercury

Mercury is a potent toxin that causes permanent damage to the brain and nervous system, particularly in developing fetuses, depending on the level of ingestion. Most exposure comes through eating contaminated fish. Currently 42 states have advisories warning people to limit or avoid intake of recreationally caught fish due to mercury contamination. Even so, almost 400,000 children are born each year to mothers whose blood mercury levels exceed the reference dose established by EPA, which builds in a margin of safety.

Recent actions to reduce mercury emissions from medical waste incinerators and municipal waste combustors are significantly reducing emissions of mercury. In fact, full implementation and compliance with medical waste incinerator and municipal waste combustor regulations will result in significant mercury emission reductions from these important sources. Power generation is now the largest uncontrolled source of mercury emissions, contributing approximately 35% of the total anthropogenic mercury emissions in this country. President Bush's Clear Skies Initiative would put a cap on mercury emissions from power generators.

V. THE FUTURE

Although the focus of this hearing is Clean Air Act successes, not new legislation, I would like to take a brief moment to describe President Bush's Clear Skies Initiative. The President believes Clear Skies is the best way to address the most serious of the challenges I have just described. The initiative builds on the tremendous success of the Acid Rain Program, using its cap-and-trade model as its foundation. The President's proposal sets mandatory caps on emissions from power generators, and gives facilities the opportunity to comply through trading, which provides compliance flexibility, cost savings, and incentives for technology innovation.

Under the Clear Skies Initiative, all Americans will benefit from cleaner air as emissions of the major pollutants from power generation (SO_2, NO_X and mercury) are reduced by roughly 70 percent. The President's proposal will dramatically reduce the number of areas with unhealthy levels of fine particles, and provide health benefits to tens of millions of people. An integrated approach, Clear Skies will reduce all the concerns associated with regulated pollutants from power plants across the nation, including fine particles, ozone, mercury contamination, acid rain, nitrogen deposition and visibility impairment. As a result, we will see thousands fewer premature deaths, millions fewer incidences of aggravated asthma and respiratory symptoms, and reduced risk of childhood illness. Clear Skies is a clear winner for the American people.

Thank you. I would be happy to answer any questions that you may have.

Mr. BARTON. Thank you, Mr. Holmstead.

We have a few housekeeping things. Then I have got a question for you.

We are going to do a fair number of hearings on the Clean Air Act, and the EPA is going to be asked to testify probably at almost every one of those hearings. We like to have the testimony so that the staffs on both sides can look at it. What is our minimum requirement for testimony? Two days.

Your testimony got here last night at 9 o'clock. So the minority got mad at us, because we were hiding the testimony, when the fact is we didn't get it until 9 o'clock. So in the future, if you would ask Governor Whitman, encourage her and all the other folks like you that come up to represent your agency to try to comply with us in getting us your testimony so that those that agree with it can study it and ask you softball questions, and those that disagree with it can ask you very smart, tough, pointed questions; and between those two, we will get a good hearing record. Could you try to help us out a little bit on that?

Mr. HOLMSTEAD. I will do my best, and I can tell you, I would have rather been doing something else at 9 o'clock last night than trying to finish up that.

Mr. BARTON. Well, I know it is a fairly tortuous thing to get testimony cleared through the White House and OMB and all that, but if you start the process sooner, it gets finished sooner, and we get it on time, and it just helps us.

Mr. HOLMSTEAD. I will give you the name of Laurie Schmidt here, so you can call her if the testimony is——

Mr. BARTON. Is that the young lady there in the red blouse?

Mr. HOLMSTEAD. Thank you. We will do that. Yes.

Mr. BARTON. All right. Now start the clock.

This subcommittee, as Mr. Dingell pointed out and Mr. Waxman and Mr. Markey and Mr. Hall—they have worked with various administrations throughout the years as we get into these issues on the Clean Air Act.

A lot of the information that is required to make an informed decision on legislation is technical in nature, and the EPA staff has that information. Now I have talked to you on the phone several times. I met you in person several times. I have talked to Governor Whitman several times, and at every one of the meetings I have asked that your staffs work with our staffs on both sides of the aisle to get us the information so that we can have an informed debate.

That has yet to happen. Now this Clear Skies initiative that the Bush Administration is putting forward, I think, has a lot of merit, but none of the staffers on the Hill have any idea what the technical basis is for that. What can you do to tell the subcommittee today that the EPA staffs are going to work with our staffs and help provide information so that both sides of the aisle can actually analyze what is going on and try to come to some joint understandings?

Mr. HOLMSTEAD. I do understand that we have a lot of detailed analysis that really only we can produce, and you as well as members on the Senate have been asking for that, and I again apologize that we have been slow in getting that up, and I promise you that we will be remedying that beginning this week.

I do want to just give you a sense of just how complex this is in terms of the kind of information that I think you are interested in, and I won't take up a lot of time. The computer modeling runs that we do to analyze this are the kinds that—there are actually two different runs, and we have to take the output from one and use it in another. I am happy to talk with your staff more about all of the technical details.

The bottom line is it actually takes several months to complete and to QA these computer runs, and during the development of the Clear Skies proposal we, obviously, did a number of different runs that we are preparing now to turn over to you, beginning this week.

Just so you know what we are sending up, which I think will satisfy everyone who has been asking us for this information, we have air quality modeling analysis, the kind of state-of-the-art analysis that really only EPA can do, on four, and we are working on a fifth. What we plan to give you, I hope by the end of this week or by the beginning of the following week at the latest, is all of those modeling runs.

There are some that are less stringent, there are some that are more stringent than the Clear Skies proposal. Those were really used to bound the——

Mr. BARTON. We are going to get that information in the next 2 weeks?

Mr. HOLMSTEAD. Yes, sir, and we will provide all of the air quality modeling information as well as all of the—We have a linear programming model that actually goes through and predicts impacts on different facilities. That is extremely comprehensive, and we also plan to give you, in addition to the air quality modeling runs, the underlying modeling runs that shows the various impacts on fuel supply, price, many other things, and you will have all of that within 2 weeks.

Mr. BARTON. In the charts that you put up earlier that you showed the Gross Domestic Product going up and almost all the other trend lines on emissions going down, is there one underlying issue or one underlying technique that has most caused the trend lines for air emissions to go down, which means the air quality would go up? Is there some lesson that we have learned from the 1990 amendments that we can apply to any future reauthorizations in a general sense?

Mr. HOLMSTEAD. I think the single most important thing that we collectively have learned, members of this committee, people at EPA, people in the academic arena who have looked at these issues, is the use of market based tools that actually create incentives for companies to look for better and cheaper ways to control pollution.

You know, 20 years ago, I think a lot of people thought that the best way to do it was just tell people what kind of technology to put on. We have learned, for instance, in the acid rain—The acid rain program is probably the most visible example, but we use it in many other cases—that if we set a standard and then allow people the flexibility to meet that standard in the most cost effective way, we tend to get reductions faster and cheaper.

More importantly, if we actually give people a financial incentive to overcomply, as was the case with the acid rain program where, if they did more than they were required to, they would create what we call allowances that have value, then it spurs a lot of technological innovation. We have tried to use those same sorts of programs, for instance, with our automobile standards and even fuel standards where we allowed that sort of banking and trading of allowances that have been achieved through overcompliance.

So I think, if I had to mention one lesson, that would be the most important thing that we have learned over the last—and particularly over the last probably 10 or 15 years as we do this.

Mr. BARTON. My time has expired. I would recognize the gentleman from Virginia for 5 minutes for questions.

Mr. BOUCHER. Well, thank you, Mr. Chairman, and Mr. Holmstead, thank you for your testimony this morning.

Many of the statements that have been made here, both by members and by you, have celebrated the successes that we have achieved under the 1990 amendments and the underlying Clean Air Act. The air is clearer today than it was 30 years ago. We have had dramatic increases in the economy and large increases in fossil fuel use, and yet we have cleaner air now than we did three decades ago.

Given that reality, do you see any overwhelming reason why we should open the Clean Air Act in some substantial way? Have we not already, through the law, given EPA the tools that it needs in order to conduct even further proceedings and through those further proceedings assure a continuing increase in air quality?

Mr. HOLMSTEAD. There is no question that the Clean Air Act has been remarkably successful in cleaning up the air. We have learned a lot over the last 30 years, and there are some things that we, quite frankly, would do differently.

One of the things that I would mention specifically is, as I think you all know, the basic theory underlying the Clean Air Act is that EPA sets these national ambient air quality standards, and then States have the primary responsibility and the discretion to figure out the best way of coming into attainment with those standards.

One of the things that we now know, and especially as we look at the problem of ozone and fine particles, is that oftentimes high levels of those particles don't come from sources nearby, but can actually travel hundreds of miles from several States away. The current mechanism that we have to deal with that is something called Section 126 that is actually sort of a cumbersome process whereby one State petitions EPA to regulate a source in another State.

This is really what we are trying to accomplish with the President's Clear Skies initiative. Rather than having this cumbersome petitioning process which can take years and years and years by the time you include the litigation, we would very much like to convince you all and your colleagues in the Senate that we can accomplish a great deal more a great deal faster and at less cost using a cap and trade program.

So I know that there are some people who are reluctant to fix something that has worked so well, but we do believe that there are ways that the Clean Air Act can be improved.

Mr. BOUCHER. So Section 126 would be among the recommendations that you will make to the Congress. When the President announced his Clear Skies initiative, he said that it was designed to replace existing clean air programs. Did he mean that literally? Are you preparing comprehensive legislative recommendations that will replace existing clean air laws and, if so, can you at this point give us a summary of what specific programs you would propose to replace beyond Section 126?

Mr. HOLMSTEAD. Our goal all along in the Environmental Protection Agency has been to create the most efficient and most effective program that we can to achieve the environmental benefits. Part of that, in our view, means replacing programs that are really no longer necessary in light of the stringent caps that we have on the utility sector.

Right now, depending on how you count them up, there are between sort of 8 and 12 different regulatory programs that will have an impact on the power sector over the next 15 years. We believe that some of those are completely redundant and actually could be counterproductive.

Let me just be clear that we are not talking about replacing 126. That is an important tool that States have used to identify upwind sources. Now we are looking at how that might work in the context of Clear Skies and whether there would be some unique role that 126 would play in dealing with power plants, but it would still remain in place for every other type of source, and probably in some respects for power plants as well.

So I don't want to leave you with the impression that we are talking about eliminating Section 126, because I think that would be a mistake. We do believe that the NSR program would actually be counterproductive with this sort of a cap and trade system, and I know that there is a lot of controversy about that. I would be happy to talk more about it.

I honestly can't figure out why, because right now the NSR program gets us no additional reductions of SO_2. It may get us some modest reductions in NO_X emissions, but nothing compared to what we would get under the President's proposal. Having that sort of a program that just adds delay to the way that facilities would achieve these new caps, we think, would be a mistake.

There is another rule that is coming up that we refer to as the BART rule. It stands for best available retrofit technology. That would really be entirely redundant in light of the caps that the President has proposed. We are looking at other things, and we hope within the next few weeks to work with members of both sides of the aisle, both in the House and in the Senate, to develop a more detailed legislative package that deals with the interaction of Clear Skies.

Mr. BOUCHER. Mr. Holmstead, let me just ask you one additional question, with your indulgence, Mr. Chairman. Do you have a schedule for bringing up to Capitol Hill legislative recommendations?

Mr. HOLMSTEAD. At this point, we do not.

Mr. BOUCHER. You do not? All right. Thank you, Mr. Chairman

Mr. BARTON. I thank the gentleman from Virginia. We would recognize the gentleman from Illinois for 5 minutes for questions.

Mr. SHIMKUS. Thank you, Mr. Chairman. I work as an Army Reservist to help train some future generals to deal with Members of Congress in this type of setting, and it is a lot of fun. What we kind of warn them about is be prepared for any question, even though you might be here to discuss a certain subject. So here is your chance to excel.

Mr. HOLMSTEAD. I appreciate the warning.

Mr. SHIMKUS. That is right. My concern deals with a lot of issues that have brought up to me in my Congressional district, and it deals with methyl bromide, which is a fumigant used to control insects in weeds, pathogens in more than 100 crops and forests. Of course, on January 1, 2003, the amount of methyl bromide will be reduced by 70 percent.

Can you assure current users of the product that by January 1 effective and commercially viable alternatives will be available to substitute for 70 percent of the use?

Mr. HOLMSTEAD. I think this is a good example of the sort of thing that this committee has done in the past to actually amend the Clean Air Act. Originally, when the Clean Air Act was passed in 1990, methyl bromide would have been completely phased out, 100 percent phased out by the year 2001.

Back in 1998 this committee, led by this committee actually, that schedule was pushed back to be consistent with the Montreal Protocol. So that was, I think, an important change so that we wouldn't be disadvantaging our farmers compared to farmers around the world.

The way that statute worked that amended the Clean Air Act in 1998, there are actually three steps in the phasedown. So I don't think it is quite right to look at this as a 70 percent reduction in 2003. There was already a 25 percent reduction, then a 50 percent reduction which I think went into place last year or the year before, and then we go from 50 percent to 70 percent. So it is that additional increment.

We are certainly working very hard with our colleagues at EPA who deal with agricultural issues, and also our colleagues at the USDA who look at all these issues. My sense right now is that, given the kind of creativity and innovation that we have seen in the agricultural sector, that when this next phase goes into place that there will be sufficient quantities of other alternatives to allow farmers to continue to have the kind of crop protection tools that they need.

I can't say that it is going to be painless, but we have worked as hard as we can with our colleagues at EPA to get other things approved. We have worked with our colleagues at Agriculture, and I think at this point that we believe that that will be achievable, given the kinds of things that we are seeing that are coming on the market right now.

Mr. SHIMKUS. Well, I would follow up then, and ask for you to work closely with the USDA, who has spent over $100 million for research alternatives, and I am not sure they are as optimistic as you might be of the ability to replace this. If you can do that, if we are getting contradictory signals, then that would be helpful for me to know. But I think there is a big concern out there, because there has been reduction, but the next phase could be at such great

cost that it will be economically unfeasible and cause great harm in central and southern Illinois, for sure, and anyone. It is not just our commodity products but also in the storage of grains. It is a critically important ingredient.

So I just throw that out. If you work with me on that, it would be helpful.

Mr. HOLMSTEAD. I would be delighted to do that, and we can make sure that our staff is in contact with someone that you would designate.

Mr. SHIMKUS. And I think from your opening testimony, from what I hear, and now going back to the issue at hand, that this cap and trade issue is something that is receiving great optimism in the future.

Can you just briefly talk about the whole issue of "hot spots" and how the cap and trade issue deals with the whole debate on "hot spots"?

Mr. HOLMSTEAD. Back in 1990 there was a fair amount of concern about that issue, because trading would be allowed—Some were concerned that we would create "hot spots." Let me just say two important things that I think everyone needs to be aware of.

First of all, everyone would still be required to meet the Federal standards for clean air. So the NAAQ standards remain in place, and under any sort of a trading program every area of the country is required to meet those. It is not as though this trading program can overrule that. So essentially, people are guaranteed that the existing mechanisms of the Clean Air Act will protect against that.

In addition, what we can say—Again, this is one of these areas where I have been a little bit annoyed. There was a report that came out from one of the environmental groups that picked out a couple of areas where they said emissions had increased between 1995 and 2000.

Well, again, you can prove almost anything if you manipulate the baseline years. Given that the acid rain trading program actually started in 1990, if you look from 1990 to today, everywhere in the country has cleaned up. There is no part of the country that has air that is—Well, let me say that in a slightly different way. There is nowhere in the country where utility emissions are higher as a result of the cap and trade program.

So it is true that some facilities may reduce more than others, but facilities across the board reduce every where, and especially when we are talking about the kinds of reductions that the President has proposed. More than 70 percent, or basically 70 percent of all three pollutants, there is simply no possible way for there to be "hot spots" that would cause levels of concern.

Mr. BARTON. The gentleman's time has expired. The gentleman from Michigan.

Mr. DINGELL. Mr. Chairman, thank you. Mr. Holmstead, welcome to the committee. I note that Administrator Whitman has reaffirmed EPA's commitment to lower the level of sulfur diesel fuel to 15 parts per million by mid-2006 as a part of the heavy duty diesel engine rule. Removing sulfur from diesel fuel will have substantial benefits to air quality, including reductions in particulate matter, oxides and nitrogen, and SO_2, some of this on the order of 90 to 95 percent.

Clean burning diesel technology is accepted widely in Europe. Forty-eight percent of the passenger vehicles sold there last year, including 75 percent of luxury vehicles, will have clean burning diesel engines that are made possible by removal of sulfur from fuel. The fuel economy of these vehicles is phenomenal.

Audi's A2 gets 78 miles per gallon. This is in a full size vehicle. In Europe, the sulfur standards range from zero parts per million in Sweden to 10 parts per million in the rest of Europe. By 2010 diesel fuel must be sulfur free throughout Europe.

Now is there any technical reason why EPA did not set the standard to be consistent with the European standard, thereby allowing widespread introduction of clean burning diesel and clean burning diesel engines of extraordinary fuel efficiency? Is there a technical reason why they didn't?

Mr. HOLMSTEAD. The issue, I think, that you are raising is why the difference between our standard, which is 15 parts per million——

Mr. DINGELL. No. The question, sir—I have a special reason for wanting the answer to the question in the particular form in which I gave it to you. I will repeat. Is there any technical reason why EPA did not set the standard to be consistent with the European standard, thereby allowing widespread introduction of clean burning diesel and clean burning diesel engines? Yes or no?

Mr. HOLMSTEAD. I think there may be a technical reason, and I would be happy to——

Mr. DINGELL. Are you aware of it now?

Mr. HOLMSTEAD. Here is what I think the issue is.

Mr. DINGELL. Is there any technical reason why we couldn't do it?

Mr. HOLMSTEAD. I think there is, yes. I believe it has to do with the way fuel is transported. In our country, given how much we use pipelines to transport the fuel, even if you eliminate sulfur entirely at the refinery, by the time it actually gets to the place where you put it in the cars, it tends to pick up—We are talking about parts per million levels here, and my understanding is that actually, given the kinds of—and again very small amounts of sulfur that can be introduced in the transportation system. That is the issue.

Mr. DINGELL. Sir, Europe has the same transportation problems we do, do they not?

Mr. HOLMSTEAD. I am not sure of that, but I do want to assure you of this, that we believe, and all of our technical people strongly believe, that with 15 ppm diesel fuel that that will facilitate the widespread use of clean, very fuel efficient cars in this country. So we don't expect that the small—Remember that right now much of the fuel is 5,000 or 3,000 ppm. So by going from that, from the 5,000 or 3,000 or even 500 ppm down to 15, we will facilitate the use of that.

Mr. DINGELL. You just said something there, and you said that the levels that you have fixed it at are going to permit us to go to clean burning diesels and clean burning fuel. I want you to make that as a flat statement, not as a statement in which you say "I think" and "maybe," because I want this record to reflect what EPA did, and I want you to give us a good, hard answer and not a toad answer.

Now is this going to facilitate the use of clean burning diesel engines like the A2, or is it not?

Mr. HOLMSTEAD. Yes, it will.

Mr. DINGELL. It will?

Mr. HOLMSTEAD. Yes.

Mr. DINGELL. And what will be the fuel efficiency of those engines?

Mr. HOLMSTEAD. That will depend on many things. I honestly don't know, but we do know that on average you will get better fuel efficiency from diesel engines.

Mr. DINGELL. Let me ask you this question. The standard is an average. So if one refiner or one refiner run is at zero and another refiner run is at 30, you are going to have somebody getting runs which are going to be high in sulfur. This high level of sulfur in the fuel is going to create significant problems in terms of the operation of the catalyst, and the end result is the catalysts are going to get skunked up, as they do with lead.

The end result is you are going to have a lot of unworkable catalysts. EPA is not going to allow the shift to an A2 or something like that, simply because the fuel does not clear the catalyst in proper fashion, reacts in a way inside the catalyst that makes the catalyst not work. Isn't that so?

Mr. HOLMSTEAD. I don't think we—It is certainly true that excessive sulfur levels can clog what is referred to as the catalyst. We don't believe that that will happen with the fuel standards that we have set, and I would be happy to provide much more detailed technical information, but we have——

Mr. DINGELL. I am going to send you a letter so that you can give us a much more definitive response to these matters, because I know you——

Mr. HOLMSTEAD. I have seen some of your letters before. We will look forward to the opportunity.

Mr. DINGELL. I know you want that assistance, and I know you want to give us an answer which is helpful to the concerns which I have expressed today. For that reason, Mr. Chairman, noting my time is getting close to expiration, I would ask unanimous consent that the record be kept open both for the letter, which I will send to you, dear sir, and also to the Department of Energy, asking certain questions.

Of course, I know you are going to make all effort to get that letter response back so that our chairman will not be distressed about the fact that you have——

Mr. BARTON. You know, I would not want to be distressed, and I am distressed when Mr. Dingell is distressed. So we want to keep us both undistressed. I think that is fair to say.

The gentleman's time has expired, and we will have a second round of questions for this witness if the panel wants to. I want the members to know that.

The Chair would recognize the gentleman from Kentucky for 5 minutes for questions.

Mr. WHITFIELD. Thanks, Mr. chairman.

Mr. BARTON. Will the gentleman suspend? The gentleman from Michigan had a unanimous consent request. Would the gentleman from Michigan—Could we have the gentleman from Michigan's at-

tention, please? Would you restate your unanimous consent request? I know you asked.

Mr. DINGELL. I asked to have the record kept open so that the letter could be in this record, if you please.

Mr. BARTON. Hearing no objection, so ordered.

Mr. DINGELL. Thank you for your kindness, Mr. Chairman.

Mr. BARTON. The gentleman from Kentucky is now recognized for 5 minutes for questions.

Mr. WHITFIELD. Mr. Holmstead, the 1990 amendments relating to Title III included a list of 189 substances to be regulated by the Environmental Protection Agency. I was reading Dean Goldstein's testimony, and he was talking about how the fact that we have gone to this precautionary principle in changing the burden of proof basically on listing an item, that that presented real problems in determining the impact on health. He specifically stated, "Simply put, you cannot know what harm has been averted if you regulate pollutants without sufficient degree of what their harm is."

Would you comment on the concern about this precautionary principle?

Mr. HOLMSTEAD. I think Mr. Goldstein actually raises a legitimate concern that we have also been looking at. The theory behind Title III was that we would—It is a technology based program. So that what we would do is look at the technology that is currently being used in an industry sector. There is sort of a complex formula for doing that, but then making sure that that same technology is used in the rest of the sector.

So the theory is this was just a program to make sure that we are sort of leveling the playing field by requiring good technology across the whole sector. One of the things that I think we have learned over the last 10 years or 12 years is that, because we are regulating individual compounds and so you are only subject to regulation if you use or emit one of those 188, in at least some cases what that has encouraged companies to do is to simply switch from a listed compound to an unlisted compound.

We know relatively little about the relative toxicity of those different things. So I think it is something of a concern. On the whole, I think we are confident that, viewed as a whole, the program has been successful in reducing hazardous air pollution and reducing risk. Because it is not a risk based program, we know relatively little about exactly what those risks have been, and that is one of the things that we are struggling with right now.

I will tell you that we are nearing the end of this program. We are almost through with the Title III program and are entering a phase now that we refer to as the residual risk phase where we actually do look specifically at the risks. Technically and scientifically, it is much more challenging, but I think it is a more effective way than the technology based standards have been, although I think, viewed as a whole, they have been quite successful, but I think there are some legitimate concerns that all of us have about those.

Mr. WHITFIELD. And the EPA cannot remove a compound from the list unless there is proof that there is no harm. Is that correct?

Mr. HOLMSTEAD. That is correct, yes.

Mr. WHITFIELD. Now methyl bromide, that is on the list. Is that correct? That is one of the 189?

Mr. HOLMSTEAD. I believe that it is.

Mr. WHITFIELD. Now it is my understanding that on January 1, 2003, the amount of methyl bromide will be reduced by 70 percent. Can you ensure current users of the product that by January 1, effective and commercial viable alternatives will be available to substitute for that 70 percent?

Mr. HOLMSTEAD. Let me come back before I answer and just correct something I just said. My staff reminded me that methyl bromide is not actually one of the 188 substances listed under Title III.

Mr. SHIMKUS [presiding]. If the gentleman would suspend, we are looking through the legislation right now, and I think we have methyl bromide. For the record, it is on the list, 74839.

Mr. HOLMSTEAD. Okay. So methyl bromide is on the list of HAPs.

Mr. SHIMKUS. Right. So I just wanted to interject.

Mr. HOLMSTEAD. Let me amend my amendment. I think the real issue you are getting at, as I understand your question, really doesn't deal with the fact that it is listed as a hazardous air pollutant. That only applies to major stationary sources. I think the big concern that the agricultural community has had, and they are not regulated under Title III, is under Title VI. Methyl bromide is also listed as an ozone depleting substance and, therefore, under the Montreal Protocol.

As I mentioned just a few minutes ago, Congress actually went back in 1998 and made our regulatory structure here less stringent to give U.S. businesses more time to phaseout of methyl bromide. So under the original Act, methyl bromide would have been phased out 100 percent with no exceptions by 2001. In 1998 Congress actually adjusted that and adopted the same phaseout schedule that is required under the Montreal Protocol.

Now that Protocol, I think, required an initial reduction of 25 percent, then 50 percent, then, as you say, 70 percent.

Mr. WHITFIELD. But I notice that developing nations have until about the year 2015. Now the Department of Agriculture has spent $100 million trying to come up with alternatives for methyl bromide, and I know that all have Fast Track registration process for any alternative. Are you aware of any alternatives that they are seeking to register as a substitute at this time?

Mr. HOLMSTEAD. Yes, actually. There are several. At this point there is no single alternative that can substitute for methyl bromide in all applications. Methyl bromide has been a very effective and useful product, but there have been a number of—In fact, right now moving through the process there are alternatives that will really, I think, take the place of methyl bromide in all of the major applications that I am aware of.

Now this is something that we are looking at very closely, and we will be happy to work with you more on it, but it is a significant issue.

Mr. WHITFIELD. Mr. Chairman, I have some additional questions that I would just submit, and would appreciate if you all could get back with me.

Mr. SHIMKUS. There has already been a unanimous consent request open, and they will comply, and I would—The extra time was because of the brilliance of his last question. I wanted to make sure that he had full opportunity to respond. I will now turn to my colleague from California, Mr. Waxman, for 5 minutes.

Mr. WAXMAN. Thank you very much, Mr. Chairman. Mr. Holmstead, the Bush Administration has increasingly been criticized for withholding important information from the Congress and the public, and I want to say that I was pleased that Chairman Barton raised this issue with you with regard to the Environmental Protection Agency, because it seems like your office appears to be participating in these efforts to keep Congress and the public in the dark.

Last September I requested certain data that EPA had in its possession. That was over 7 months ago. I renewed that request on March 7, almost 2 months ago, and most recently on April 18, I and 17 colleagues on the Government Reform Committee had to invoke our rights under the 7 member rule to seek this information. Yet today EPA has neither produced the data, indicated when the agency will provide it, nor provided any reason for the delay, and that is completely unacceptable.

What, of course, we are asking for is technical data, not State secrets, and all we are seeking is data that EPA has modeled on the air quality effects and costs of requiring power plants to meet various levels and timing of pollution limits. This is data that is essential to us to evaluate the proposal that may be presented to us from the President on clean air, and I am pleased you said to Chairman Barton that you are going to finally release the data generated by EPA.

Can you tell me today that EPA will fully comply with my April 18 information request?

Mr. HOLMSTEAD. As I mentioned in response to the chairman, we are turning over all of the air quality modeling which—I don't have your request in front of me, but we are turning over all of the air quality modeling data that we have developed over the last number of months that is really relevant to the issue of controlling emissions in the power sector.

Along with that, we are giving you the underlying, what we call the IPM model runs, which are really the—It is a linear programming model that we use to look at the effects of different policies on power generators. So you will have all of that data, and we will begin to provide that with you by the end of the week. We should be able to collate it and get it all to you, and I must warn you, it's quite extensive.

Mr. WAXMAN. Well, I accept the warning, and also I want to advise you that we sent in several requests to you for information, and we would want our requests complied with. It is our way to be able to know the real facts about the President's air pollution proposal, and some of these facts have apparently been obtained by the New York Times. So technical data ought to be available to the Members of the Congress. So I hope you will look at that April 18 letter and fully comply with it.

Under the Clinton Administration, EPA sued nine power companies for violating the Clean Air Act by expanding their facilities

and increasing emissions, but failing to install pollution controls. Those nine companies are responsible for about a quarter of the total emissions of NO_X and SO_2 from the power sector, and according to a recent report, these emissions contribute to roughly 5,000 to 10,000 premature deaths per year. They also cause other harm to health and the environment.

Some people estimate that pursuing just the pending enforcement actions could reduce emissions of NO_X and SO_2 by roughly 5 million tons per year. Power companies are refusing to settle these lawsuits, because they figure EPA will change the rules to let them off the hook directly or to weaken the government's case.

In your former job, you represented industry fighting EPA on air regulations. So you know that even a proposed rule can be used in litigation to support industry's interpretation of the law. Will you commit to complete the enforcement cases before proposing any changes to the NSR rules?

Mr. HOLMSTEAD. First of all, just to clarify a misperception that you may have left with some people, I never represented anyone in the power industry, and certainly not anyone who was the subject of any of these enforcement actions, just lest anyone have that misperception. I also want to assure you, as I know Government Whitman has, as well as Attorney General Ashcroft, that we are pursuing all of those enforcement cases.

As a legal matter, as you know, nothing that we could do in terms of administrative reforms to the NSR program would have any impact on those cases as a legal matter, because——

Mr. WAXMAN. Let me ask you this, because I see my yellow light, and the time is going to be finished: The Attorney Generals is concerned EPA is undermining these cases, but the real concern a lot of us have is whether there is going to be a change in any regulation without the opportunity for public comment. Will you be able to assure us that before finalizing any rule change, you will comply with the request that you allow public comment?

Mr. HOLMSTEAD. We will certainly satisfy all of our obligations under the Administrative Procedures Act to have full public participation for all of the things that we are considering, and again I must point out that most of the things that we are considering as possible administrative changes are things that were proposed by the Clinton Administration back in 1996.

Mr. WAXMAN. Will you accept public comment on your specific proposal before it is finalized?

Mr. HOLMSTEAD. Where we need to do that under the Administrative Procedures Act, yes, we will.

Mr. WAXMAN. How about where you need to do it for public participation and good government and to make a better regulation by hearing what the other side, other views, might tell you?

Mr. HOLMSTEAD. Again just to be completely clear here, there are a few proposals that we are considering that were proposed in 1996 by the Clinton Administration. They were the subject of extensive public comment, including a number of public hearings. Since I have been at EPA, we have had numerous public meetings about those very same issues, those very same proposals.

Where there has already been a comprehensive public process, including literally thousands of public comments, at this point our

current intention is to go ahead and finalize some of those reforms. Now none of those reforms, just so you know, really have any relevance to the power sector. They tend to be things that I know your staff is aware of, things like the plantwide applicability limit, some ideas for reforms that have been around for many, many years.

The issues that seem to be of greatest concern to people are things that we are planning to go through a new public notice and comment process on. So we anticipate at this point proposing a series of possible changes and taking full public comment on those.

Mr. WAXMAN. Thank you very much.

Mr. BARTON. The gentleman's time has expired. I think the gentleman from Ohio is actually next, Mr. Hall. I think it is Mr. Sawyer's turn, but if he wants to yield to you, I would be happy to let him yield to you.

Mr. SAWYER. Thank you, Mr. Chairman. Just out of curiosity, the 90 day review on New Source Review has been going on for 9 months. Can you give us a sense of when we are likely to see the results of that work?

Mr. HOLMSTEAD. I hope it will be fairly soon.

Mr. SAWYER. I suspect we will keep asking those questions as these hearings go on.

Can I ask you what we can expect? Will it include a clarification of what we mean by routine maintenance or will it simply remove the program altogether?

Mr. HOLMSTEAD. Well, we have no ability administratively to remove the program. One of the things that we are looking at, and one of the things that many, many people have asked us to do, is to provide a more clearcut definition of routine maintenance, repair, and replacement. That is one of the reforms that at this point we are planning on doing.

Mr. SAWYER. Regulatory certainty would be of enormous value.

Mr. HOLMSTEAD. Yes, I think that is a fair point, and that is one of the things that we are planning to do.

Mr. SAWYER. Let me ask you another question. Under the 1990 amendments, how did the EPA select the total number of sulfur dioxide emission allowances to distribute, and were the allowances distributed equally among power plants? How did the power plants obtain them, and how much trading actually took place? A series of questions to let you talk about the whole trading program.

Mr. HOLMSTEAD. The issue of allowances was debated extensively, both in the House and in the Senate. In the end, as I recall, Congress actually assigned allowances in the legislation. I believe that the Title IV of the Clean Air Act actually lists all of the then existing plants along with the allowances that they were entitled to under that.

Mr. SAWYER. I couldn't remember.

Mr. HOLMSTEAD. Yes. I believe that is the case. One of the big issues always tends to be, if you allocate based on emissions, then you penalize people who are already cleaner. So the way that I think we have dealt with that in other circumstances is to do it based on heat input, which is sort of a fairer way of doing it.

What I can tell you is, yes, a fair amount of trading has gone on. As I mentioned before, the program has been just sort of amazing

for people, because there was this theory back in 1990. A lot of people were very concerned about it, but in fact, the supporters, including Joe Goffman from Environmental Defense, were correct, that when you actually give them an economic reward for overcomplying, a lot of people figured out how to do that and generated excess allowances that they could sell to other people who were not able to be as efficient in reducing those.

I actually would guess that Mr. Goffman can perhaps tell you more about the number of trades that were made, but a full market has actually been developed. You can go on the Chicago Board of Trade and actually purchase SO_2 allowances, if you would like to, and some people have done that.

Mr. SAWYER. Did Enron do that? No. Thank you very much, Mr. Chairman. I yield back.

Mr. BARTON. Probably Enron did, actually, yes. Mr. Markey is recognized for 5 minutes for questions.

Mr. MARKEY. Thank you, Mr. Chairman, very much. The first question: Have you submitted yet, Mr. Holmstead, legislative language for your Clear Skies proposal?

Mr. HOLMSTEAD. No, we have not.

Mr. MARKEY. You have not. Have the States endorsed Clear Skies?

Mr. HOLMSTEAD. I am not sure that, in terms of—Oh, I am sorry. There are some. The Western Governors Association has endorsed Clear Skies. I believe that I saw something from the Southern Governors who have issued a statement saying that they endorse a national cap and trade program at least as stringent as Clear Skies.

Mr. MARKEY. Has the Sierra Club or the League of Conservation Voters or Natural Resource Defense Council—have they endorsed the plan?

Mr. HOLMSTEAD. Not that I am aware of. I do know that the Adirondack Council, which is primarily concerned with the acid rain issue, has endorsed the program, because they understand——

Mr. MARKEY. Which group is that?

Mr. HOLMSTEAD. The Adirondack Council. This is the group that has been concerned primarily about acid rain deposition in New England, and they have endorsed it because it actually goes beyond legislation that Senator Moynihan introduced for a number years, actually gets substantially greater reductions than that bill. I think they now understand that this would really solve the acid rain problem in the northeastern United States.

Mr. MARKEY. Has any utility group endorsed it?

Mr. HOLMSTEAD. I am not sure. Not that I am aware of.

Mr. MARKEY. So the Edison Electric Institute has yet to endorse it?

Mr. HOLMSTEAD. I have seen statements saying that they are generally supportive of the idea of a multi-pollutant approach. I think they are also interested in seeing some of the additional details, in particular how allowances would be distributed.

Mr. MARKEY. Well, my problem with the whole debate is that there is no bill to read. There is no language to endorse. There is no basis for us to have a discussion. I think that I heard you say earlier to Mr. Boucher in answer to his question that you think there are 8 to 12 regulatory proposals affecting the utility industry

that you considered to be counterproductive or redundant and that, while you aren't going to propose repealing Section 126 of the Act, you did seem to suggest that you wanted to rewrite it, at least as it applies to utility power plants.

Have you given us that language yet?

Mr. HOLMSTEAD. No, and let me just clarify. I didn't say that we had identified 8 to 12 programs that would be counterproductive and that would be replaced. I said I believe there are 8 to 12 programs that would affect this sector over the next 12 years or so. There are some of those that we do think would be counterproductive, and I mentioned two of those that we have identified.

Mr. MARKEY. Which are those?

Mr. HOLMSTEAD. It is the so called NSR program and the BART program. So those are two things from the very beginning we have said that we would replace by the President's bill.

Mr. MARKEY. You think the NSR program, the New Source of respiratory illness program, is too stringent in protecting against new respiratory?

Mr. HOLMSTEAD. No, no. It has nothing to do with whether they are stringent or not. It just doesn't work very well. If you look at the utility sector, there were emissions—The New Source Review program has been in place since 1977. Emissions from that sector continued to grow all the way through 1990. In 1990 emissions were over 18 million tons a year of SO_2, and those have now been cut almost—well, not quite in half, but all of those reductions are because of the cap and trade program. It has nothing to do with New Source Review.

So we just believe that NSR is a program that hasn't worked very well, and a much better way to get those reductions is through a cap program similar to what we have achieved under Title IV.

Mr. MARKEY. Well, let me understand this. In 1999 the Clinton EPA filed lawsuits against the electric utilities in violation of the New Source Review.

Mr. HOLMSTEAD. Right.

Mr. MARKEY. Now many of the utilities were faced with being fined and forced to reduce emissions. The Bush Administration responds to utility complaints by asking the Justice Department to review the legality of the Clinton lawsuits.

Now when the Bush Department of Justice concludes that the Clinton lawsuits against these polluting utilities is legal under the Clean Air Act, then the Bush Administration announces plans to amend the Clean Air Act. So it seems to me that the Clinton Administration had put in place a tough program to reduce the new sources of respiratory illnesses in the country, these things that the American Lung Association and other health associations are very concerned about, and then as the utilities continue to drag their feet, hoping for relief, the Bush Administration gets elected. They find out that what Clinton was doing was legal in reducing the amount of pollutants. So then they say we are going to amend the Clean Air Act to take care of what the utilities want.

I think the problem is that the reason I can't read your recommendations and be educated as to what you are going to propose is that the utility industry wrote them, and that is why the Edison——

Mr. HOLMSTEAD. Mr. Markey, just to assure you that that——

Mr. MARKEY. Let me just finish my point. The Edison Electric Institute wrote the provisions, and we can't read them here on this body, even as you testify, because we are not going to be given access until all of the pieces are put in place that you can roll back the protections that were put in place in order to protect those 25 million Americans with asthma.

Mr. BARTON. The gentleman's time has expired. The Chair wants to let all members know, the purpose of this hearing is to look at what has actually happened or not happened in the Clean Air Act. Now, obviously, all members, as we all do, are free to ask questions about anything, and that is appropriate, but we are hoping to focus before we look into future legislation initiatives what has happened in the Clean Air Act amendments that we passed in 1990.

I would point out that the purpose of this hearing is not to review a Clear Skies initiative legislative proposal, which has yet to be developed. So when it is developed, we will hold a hearing on it, and perhaps at some point in time even go to markup on that legislation or something similar to it.

Mr. MARKEY. Well, I appreciate that, Mr. Chairman, but I think understanding the history of how we got to the point—that is, what the Clinton Administration was trying to do—helps us to understand why they are about to redraft the Clean Air Act.

Mr. HOLMSTEAD. Nothing that we are doing under——

Mr. BARTON. Again, the purpose of this hearing is simply to look at what has worked and perhaps what hasn't worked under the Clean Air Act as it is currently enacted. There will be lots of opportunity, and the gentleman from Massachusetts will be welcomed at hearings when we begin to be prospective, and he knows that. He is a veteran of this committee and a smart guy, and very knowledgeable on these subjects.

The Chair would recognize Mr. Hall for 5 minutes for questions.

Mr. HALL. Mr. Chairman, thank you. My questions would be basically on the effect of some of the things that have not worked, and maybe to inquire as to how they could be corrected.

Mr. Shimkus hit on methyl bromide. That is of great import to me for a lot of reasons, but for one reason, Marshall Milling Company is in my district, is in Denton, Texas, and they are affected by it. You gave some answers a few moments ago that I think you alluded to the use of methyl bromide, as to whether or not that was on the list, and then upon reading to you that you were right in the first place, it was on the list. You were thinking about the impact on the recovery of ozone layer, and they are two different things.

Now what I want to ask you about is the impact on people like Marshall Milling that have to store and process foods, and they need methyl bromide to treat pests that could infect the stored food. Now that is a goal that none of us can oppose, but since the Act—and in 1998 actually, the Congress amended the Clean Air Act to move the U.S. phaseout date from 2001 to 2005. I think I am correct on that, and that is the phaseout date for developing nations. It was at that time. However, at the same time Congress included language, it made it clear that such uses would be available.

I didn't really understand why the agency would go on to the next meeting of the Montreal Protocol and negotiate narrower language that attempted—it seems to me, that would negate the Congressional statute. That is one thing that I am concerned about.

My question is why did your agency agree to allow so called developing nations that compete with us for the business, for the sales and with our economy, to use methyl bromide until 2015, and yet you are going to phase these people out?

My last question is: They need a little more time to phaseout. Even 2 years would help them. I don't see any real opposition to that. Is that possible?

Mr. HOLMSTEAD. Let me try to answer all those questions. I think that you raise some very legitimate issues. Just to clarify, I think it is important for everyone to understand that after what Congress did in 1998 which established this phaseout schedule, the schedule in the United States is the same as the schedule for all of the other countries in the developed world.

So we are bound not only by the Clean Air Act but by the Montreal Protocol. So in order to accomplish what you suggest, which would be an additional 2 years, we would have to amend the Clean Air Act, but we would also have to seek an amendment of the Montreal Protocol or we would be out of compliance with our international obligations.

So just to put it in context, it is not anything that EPA—and I am not saying that we support that or don't support that. Just as a practical matter, it is nothing that EPA can do administratively. It would have to be both negotiated internationally with all the other parties and then it would have to adopted by Congress to give that additional 2 years.

Now we are doing a number of things to address the concerns that have been raised, and I just want to assure you of that. One of them, and I am not familiar with the specific company that you mentioned, but it sounds like they would benefit from something that we have done fairly recently, which is to have an exclusion for containment and preshipment, people who are storing food and grains.

So again, I don't know about that specific——

Mr. HALL. Is that a possibility?

Mr. HOLMSTEAD. We would have to find out for that specific company whether they are covered or not, but that is a possibility. I think we need to follow up and find out a little bit more about what specific company this is.

The other thing that we are looking at, and we are spending a lot of time with USDA right now, is developing a package—We are allowed to seek what is called a critical use exemption, and at this point we are working to put together a packet that will explain to the other members of the international community the specific circumstances we have here in this country that make it necessary for us to have some critical use exemptions to continue to allow us to use methyl bromide for a longer period of time than they might.

So we are very much involved in that process. We have regular meetings with USDA as well as members of the agricultural community. So that is another thing that we are committed to, and we hope that that, in combination with the newer alternatives that are

being approved right now, that are in the approval process, will take care of the concerns that I know a number of people in the agricultural community have raised.

Mr. HALL. If our competitors are allowed to go to 2015, surely we can afford two more years, and EPA's Registration Division has a policy that any methyl bromide alternative might be "fast tracked," whatever that means. That would be helpful. But if it would help in treating pests that can infest stored food and processed food and didn't have any significant impact on the recovery of the ozone layer as contemplated under the Clean Air Act, there is not any real reason why you all couldn't do that, if you can find the authority for it.

Mr. HOLMSTEAD. Right.

Mr. HALL. All right. I appreciate that. I yield back my time. Thank you, Mr. Chairman.

Mr. BARTON. The gentleman from North Carolina, Mr. Burr, is recognized for 5 minutes.

Mr. BURR. Thank you, Mr. Chairman. I feel compelled to follow up on Mr. Hall's line of questioning for some of it. Heaven forbid that we tick off the international community because something is beneficial to our farmers, but I hope you heard the message that he said.

I would be very curious as to what USDA's suggestions to you are relative to whether we should seek some type of critical use provision.

Mr. HOLMSTEAD. We are definitely planning to seek——

Mr. BURR. It was their suggestion that we need more time?

Mr. HOLMSTEAD. Yes, and the way we can accomplish that is through the critical use exemption process. Just so you know, EPA as an agency is just is committed to that as USDA is.

Mr. BURR. I hope that, in fact, what you are saying is, in fact, correct and that we will see that type of action.

I would be remiss, and I apologize for my tardiness in getting here late—this may have already been covered, but let me assure you, if the EPA testifies in front of this subcommittee or full committee again and brings testimony in at 9 o'clock the night before, this is one member that will vote that you not have the opportunity to testify.

That message was sent loud and clear to the last administration. I would hope, with changes in the administration, we would see changes in agencies, and it is unfair to every member of this committee. It is unfair to the American people that it would take you that long to clear your testimony through whoever needed to clear it. This committee should have ample opportunity to read your testimony, to ask you questions that are valid to your testimony, and not have to spend all night sitting up reading your testimony. Please pass that message on to the Administrator, if you will.

Mr. HOLMSTEAD. I will be happy to.

Mr. BURR. Mr. Holmstead, public opinion shows that people believe that air is getting dirtier, not cleaner, as EPA's emission trends report constantly show. Why do you think that that is the case?

Mr. HOLMSTEAD. I had better be careful, lest I be too provocative, but I think that there may be some groups that have an interest

in creating that misperception, because otherwise it makes it harder for them to attract support for their groups. I don't want to mention anybody by name.

Mr. BURR. What challenges does that present to the EPA as it relates to explaining the gains that you have made?

Mr. HOLMSTEAD. Well, we have a number of communications challenges. I think all of us recognize that we are in a political environment that is very difficult, and our mission is to clean up the air and to do it in the most efficient and cost effective way possible.

We have actually done some things to try to get out the message that the air is cleaner, is actually much cleaner, and we are getting many improvements. So from a communications perspective, it has been a challenge, and that is one of the reasons we appreciate the chance to be here today and to try to help set the record straight, that notwithstanding this misperception, the air is dramatically cleaner than it was 30 years ago, and it will continue to improve over time.

Mr. BURR. Several places in your testimony, you reference to stakeholder involvement and public-private partnerships such as the EnergyStar program and Commuter Choice program. Do you believe that the agency's experiences in these areas justify continued such efforts in the future?

Mr. HOLMSTEAD. Absolutely. One of the things that has been surprising and gratifying to me in the year that I have been at the Agency is to see the kinds of environmental benefits that we get from these sorts of nonregulatory programs where we work—and stakeholder is a word I don't particularly like. It was coined, I don't know, some years ago—with people who have a real interest in our issues from the industry sector, from public groups, community groups.

If you look at something like the EnergyStar program, if you look at all of the programs we have, for instance, focused on asthma and improving indoor air in homes and in schools, we get enormous benefits from those programs, and we do it through nonregulatory programs. I think in many ways, that is an opportunity that we are looking to expand, to continue to achieve those sorts of benefits.

Mr. BURR. North Carolina is within the reach of an agreement between the State and our generators of electricity on an agreement that will have a substantial impact on cleaning the air in our State. Does the EPA have any comment or observations on this agreement that was reached outside of the realm of the EPA and the Federal Government?

Mr. HOLMSTEAD. We support those sorts of programs, which I think have been successful not only in North Carolina but in other areas as well where, through this sort of a stakeholder process, without legislation or regulation, industry and governments and community groups have been able to come together on approaches which will necessarily involve significant expenditures of money, but people have been willing to step up to the plate and do that, and we really applaud those sorts of efforts.

Mr. BURR. Does the EPA envision that State regulators could potentially play a larger role in the future with flexibility to bring others to the table at reaching agreements that may not be nec-

essarily structured by the EPA, but do reach agreements that clean up the air and clean up the water?

Mr. HOLMSTEAD. Absolutely. I think that the culture at EPA has evolved over a number of years, and I wish I could take credit for this, but I think it is not new with this administration. I simply think that over time as the agency has become aware of the successes of these programs, has developed more confidence in State regulators and seeing the caliber of people that we have in many States, as well as the honest commitment of industry, I think that we have become increasingly supportive, and we are firmly committed to those sorts of programs and that sort of flexibility.

Mr. BURR. I thank you for being here. I thank the chair.

Mr. BARTON. Thank the gentleman from North Carolina. Would recognize the gentleman from Pennsylvania for 5 minutes of questions.

Mr. DOYLE. Thank you, Mr. Chairman. Administrator Holmstead, thank you for your testimony today and for being here.

I just have one question, because many of my questions have already been answered. You made it very clear that EPA believes that this market based cap and trade program such as is utilized in the acid rain program is going to be, in your opinion, the most effective way of addressing other pollutants. Especially in my neck of the woods, in western Pennsylvania, we have seen how we have involved State and local governments in the SIPs, the State Implementation Plans, as we were trying to achieve our emission reductions.

If this cap and trade approach is utilized on a wider basis, what do you see as the involvement of State and local governments in the process?

Mr. HOLMSTEAD. Well, let me start by saying this, and there were some maps that we were able to release, I think, last week. With the President's proposal, most areas of the country that are out of attainment with either ozone or fine particles will come into attainment with no further action by State and local governments.

One of the reasons why we are so supportive of this sort of a cap and trade system on a national basis is it really gets—It saves enormous resources at the State and the local level, because by getting this national and regional reduction in pollutants, there is no longer a need to go through the SIP process in many parts of the country.

I don't know specifically about your district. I would be happy to look at that. But it may be that those sorts of programs will continue to be effective to look at local problems, to look at priorities within your community and within your area, but they will no longer be necessary to address the Federal standards, because that will be taken care of by the cap and trade program for utilities.

Mr. DOYLE. Thank you. Mr. Chairman, I yield back, in the interest of time.

Mr. BARTON. The gentleman yields back the balance of his time. The Chair would recognize Mr. Barrett for 5 minutes for questions.

Mr. BARRETT. Thank you, Mr. Chairman, and thank you for your testimony, Mr. Holmstead. I appreciate it.

May 1 is a big day in Wisconsin, because this is the day when gasoline terminals all over the State have to transition from winter

to summer reformulated gas. This has been an issue in Wisconsin the last several years as we have seen unbelievable gas spikes as a result of this transition.

I am concerned, because I am worried that EPA, although it certainly has indicated its interest in clean air, does not seem to be at all sensitive to the issue of price spikes or price stability that accompany this program. Earlier this year I wrote a letter to Administrator Whitman back in March proposing a government-industry partnership to prevent retail gasoline price spikes in the midwest this summer.

I sent a similar letter to the president of the American Petroleum Institute and to Energy Secretary Abraham. I was very pleased to get a prompt response from the president of the American Petroleum Institute, but I am disappointed that he is the only one so far who seems to have any specific interest in this problem.

As I noted to Ms. Whitman in my letter to her, the EPA's recent initiatives on blendstock accounting may well help the problem, but I don't think that these measures alone are enough to have a quiet summer in Wisconsin as it pertains to this issue.

I would like you to respond to my concern and to relay my concerns to the Administrator, because simply saying, well, price is not our issue leaves the people in the State of Wisconsin befuddled and leaves them at a loss as to what to do.

I understand what the EPA's role is, but I can't fathom a situation where, if prices go to $2, $3, $3.50 a gallon, that there is no concern there from the EPA.

Mr. HOLMSTEAD. If I can just tell you the extent to which we are concerned about this issue, I get every day an update on wholesale and retail prices of reformulated gasoline, and there are a number of people who watch this very carefully, because we are extremely concerned about the price spikes that we have seen over the last couple of years during this transition period.

We engaged in a very comprehensive process. We met with State officials. We also met numerous times with folks in the industry to try to figure out if there was a better way for us to have our regulatory program that meets the requirements of the Clean Air Act, but also makes this transition program work better.

We have adopted three reforms. We had proposed a fourth reform, and then were convinced by the industry that it could actually make things worse. It was not only the blendstock accounting rules that you mentioned. We have granted additional discretion in what we call the first tank turnover to alleviate and to make that whole transition from winter to summer go more quickly.

I am sorry that you haven't received a response yet. I will check into that, but I can assure you that this is something that we take very seriously, because we don't like the perception or the misperception that our program is creating a hardship on drivers in the midwest. That is not what we are about. We have done everything we can to try to improve that, and we are happy to sit down again and think more creatively with State officials and with industry officials to see if there is a better way for this program to work.

Mr. BARRETT. If you could tell me the extent to which you have worked with industry. I just want the prices not to go through the

ceiling. That is perception or misperception. I just remember coming out of a stall in a men's room and having a constituent waiting for me, because gas prices were so high in the midwest and in Wisconsin, in particular.

To me, I need to know specifically what you are doing with industry. I saw the testimony of the president of Marathon—I think it was Marathon—yesterday before the Senate committee, saying that there was no withholding of supply. I can't accept the notion that, well, that is not our bailiwick. So I need to know what you are doing to make sure that the supply is adequate. The issue is adequate supply.

Mr. HOLMSTEAD. I want to be careful how I say this, because I want to make sure that I am saying it precisely. We have looked at this issue every year since before I got there. The first thing that almost was on my plate when I arrived last April was this very issue.

In our conversations with many of the industry groups, what they tell us is that there are many other explanations for these price spikes, and I can't go through them all. I am not a refinery expert or a supply expert. They think that actually very little, if any, of these price spikes have to do with EPA regulations.

Now everyone likes to point their finger at us, and we have tried to look at everything we can. I can tell you, we have had numerous meetings with not only the trade associations, API and NPRA, but we have also met with a number of the refineries that supply those areas to talk about ways in which we can make our program work better.

There are many other market forces at work that have little or nothing to do with EPA, and those we can't control. But what I can tell you is anything that we can do, we are doing, and anybody that has any additional ideas, we are happy to sit down and talk with them about that, because that is a very serious issue.

Mr. BARTON. The gentleman's time has expired.

Mr. BARRETT. One second, if I may. Again, my request specifically is to follow up with the Administrator and ask her for a response. If you can let us know what you are doing, we are in the dark. We don't know what you are doing.

Mr. HOLMSTEAD. I will make sure that we follow up on that and get you a response.

Mr. BARRETT. Thank you very much.

Mr. BARTON. Before we recognize Mr. Radanovich, the Chair has participated in the last 6 years in at least two, and I think three, investigations of alleged price gouging, supply withholdings. In every case, we found out that there are acts of God and market forces that are predominantly, if not totally, the cause of the increase in prices.

I mean, the fact is we have got a very tight refinery situation in this country. World economy is coming back, and if you get a little bit of discontinuity in the pipeline somewhere, there is going to be some regional price spikes. I mean, I don't know in this case, but that is the case—That is what is happening in every other look-at we have had at these issues.

Mr. BARRETT. Mr. Chairman, if I could respond just for 10 seconds.

Mr. BARTON. Sure.

Mr. BARRETT. Certainly, acts of God—I am not messing with the big guy or the big gal, but the refinery issue—There certainly, I think, is a correlation in the size of the refineries and the fact that we have fewer and fewer refineries.

Yes, I understand your comment alleged this or that. The reality in Wisconsin is people feel they are being gouged, and it is Republicans. It is Democrats. It is Independents. Everybody feels they are being gouged. So there is probably a different perspective in Texas where some of this comes from, but in Wisconsin——

Mr. BARTON. Well, our people feel gouged. There is no regional gouging implication.

Mr. BARRETT. Come to Wisconsin.

Mr. BARTON. I mean, they feel just as gouged in Texas. The fact is, when gasoline goes above $1 or $1.25, everybody——

Mr. BARRETT. I am talking $2. I'm talking $2.

Mr. BARTON. Well, I would encourage them to vacation in Texas this summer. You can still get it for $1.26.

Mr. BARRETT. That is why there is all those rich people in Texas and not that many rich people in Wisconsin.

Mr. BARTON. The gentleman from California is recognized for 5 minutes.

Mr. RADANOVICH. Thank you very much, Mr. Chairman. Thank you. I am going to bring up a subject that certainly has come up, I understand, and that is methyl bromide. I need to way in. I come from one of the top agriculture producing counties in the Nation, Fresno, California. I am dismayed at the agencies—No. 1, their insincerity. I think, on the 2001 deadline for providing a suitable replacement when guarantees were made that suitable replacements would be fast tracked for Federal approval by the time that methyl bromide was phased out. And by an appearance of the administration not to move the phaseout period from 2001 to 2005, as was expressed by Congress. Especially when, as I understand, during the Montreal Protocols the negotiators' narrow language did not include the extension of the phaseout period from 2001 to 2005 in their negotiations, even when Congress had already spoken to that issue.

What is the intent of the administration? No. 1, are we going to fast track some reasonable alternatives, those that are acceptable to the farming community in the United States? Are we also going to extend that deadline to 2005?

Mr. HOLMSTEAD. We already did that.

Mr. RADANOVICH. You took care of it?

Mr. HOLMSTEAD. Yes. That was effectively done by Congress in 1998. The deadline for the phaseout of methyl bromide was originally 2001. With the encouragement of then the Clinton Administration, the Congress actually did move that back to adjust our statute. So the phaseout date for methyl bromide is 2005.

Mr. RADANOVICH. Was that included in the Montreal Protocols?

Mr. HOLMSTEAD. Yes. The situation before then was that in the 1990 amendments Congress actually put the United States on a more aggressive, more stringent schedule.

Mr. RADANOVICH. Right.

Mr. HOLMSTEAD. Then in 1998 Congress then adjusted that schedule to push it back from 2001 to 2005. So that is the case right now. I think the big concern—A legitimate concern that people in the agricultural community have is that there is a gradual phasedown. The first two phases have already occurred. There was a 25 percent reduction a couple of years ago, and then a 50 percent reduction.

In January of 2003, it goes from 50 percent to 70 percent, and I think there is legitimate concern by people who have used methyl bromide for many years—they know how it works—about what they are going to do. We are working very closely not only with the ag community but with our colleagues at USDA to make sure that there are adequate alternatives.

Now we, obviously, don't do the R&D work to develop those, but we have fast tracked them. I need to check with my colleague in the Pesticide Office, but there is at least two and maybe more alternatives that are under review right now that we expect to have approval on very soon.

Mr. RADANOVICH. Would you call that under fast track?

Mr. HOLMSTEAD. Yes. Oh, yes. Those approvals—Let me just assure you that we listen to the agricultural sector.

Mr. RADANOVICH. Good.

Mr. HOLMSTEAD. And those are being fast tracked right now to get those done.

Mr. RADANOVICH. Thank you. I appreciate the clarification. Thanks.

Mr. BARTON. Does the gentleman yield back his time?

Mr. RADANOVICH. Yes.

Mr. BARTON. The gentleman from Tennessee, Mr. Bryant, is recognized for 5 minutes.

Mr. BRYANT. Thank you, Mr. Chairman. I apologize. We have a number of commitments, as the speaker understands, that keep us from this hearing, but I wasn't sure I was going to be able to get here and had submitted some questions, or will be in the process—I didn't bring them with me—of submitting some questions for the speaker to answer and just add as, I assume, a late filed exhibit to your testimony.

I would like to ask, if I could, though, in just sort of a follow-up to that: During the rulemaking process regarding diesel fuel for over-the-road trucks, and particularly on behalf of the marketers of that fuel, we ask that, and tried to pass some guidance to the EPA on the phase-in period of that new, cleaner burning diesel fuel.

Initially, we were able to get that passed, I think, through the subcommittee, but in the full committee it was rejected, and a number of very powerful groups were out there working against us on that.

Quite simply, the whole issue to the marketers was the expense involved in maintaining separate tanks during the phase-in period, and they were willing to go ahead and move forward quickly and go to the cleaner fuel immediately at the initial starting point rather than have to incur the additional cost and risk the complications of mixing up the fuels and putting them in the wrong trucks or not being able to afford a second tank and having to send customers

down the road to their competitor, things that just don't really work in the real commercial world out there.

We weren't successful in doing this. It was thought that the concept of maybe bringing in the cleaner fuel four or 5 years earlier might result in some cleaner air four or 5 years earlier, and that many of the groups out there that like clean air would support that. To the contrary, they were suspicious of this and were afraid to support it in fear, perhaps legitimately, that if you open it up in one spot that other people would open up in other ways, and maybe just defeat the whole program in the end.

It did not work, but one of the discussions we had in the negotiations about that was that the EPA would consult with those marketers. Even though we weren't going to be able to eliminate the phase-in, they would consult with the marketers over this and perhaps work out with them something that would be more equitable in terms of the economics of it. That has not occurred.

I have heard from the marketers, and they are not—They are waiting. They are sitting there anxiously by the phone every Friday night waiting for that call, so they could go out with you and talk about this, but they are not getting the call. So I would encourage you to go back and see if we couldn't move that along, and perhaps open up some discussions with them. I would appreciate that.

Let me also—Oh, I would ask also for unanimous consent, Mr. Chairman, for my late filed questions to be answered and be made part of this record.

Mr. BARTON. Without objection, so ordered.

Mr. BRYANT. I would yield.

Mr. BARTON. The gentleman yields back the balance of his time. Does the gentleman from Mississippi wish to ask questions?

Mr. PICKERING. Mr. Chairman, not at this moment, if I could yield back to you.

Mr. BARTON. Does any other member of the panel wish to ask a follow-up question before we release the witness? Mr. Doyle, Mr. Sawyer, Mr. Boucher, Mr. Whitfield? Mr. Whitfield, do you have a second question or two for Mr. Holmstead? Okay.

We will release you. Thank you for your testimony. We will have some written questions for you. I would ask that you be expeditious in replying, and also some of the pending material that you talked about in your opening statement and questions to me and answers to myself and Mr. Waxman. We would appreciate that. But we look forward to working with you.

One of your predecessors in the Clinton Administration, Mary Nichols, got to be on a first name basis with most of the subcommittee and the staff in our series of hearings, and we look forward to getting to know you just as well.

Mr. HOLMSTEAD. Thank you very much.

Mr. BARTON. Thank you, sir.

We would like to now call forward our second panel. We would like to have Dr. Bernard Goldstein who is the Dean of the School of Public Health from University of Pittsburgh come forward; Dr. James Lents who is with the Environmental Policy, Atmospheric Processes and Modeling Laboratory at the University of California at Riverside; Mr. Joseph Goffman who is an attorney for the Global and Regional Air Program for the Environmental Defense Fund;

Mr. Alan Krupnick who is a Senior Fellow and Director, Quality for the Environment Division at the Resources for the Future; Mr. David Driesen who is an Associate Professor at the Syracuse University College of Law. I think I got everybody.

Before we begin, Mr. Doyle of Pennsylvania wishes to make one of his special introductions to a constituent. So the Chair would recognize Mr. Doyle for an introduction.

Mr. DOYLE. Mr. Chairman, thank you very much for allowing me the opportunity to introduce Dr. Bernard Goldstein. Since I joined the subcommittee at the beginning of last year, I have had the pleasure of introducing a number of distinguished individuals from Pennsylvania, including many from my hometown of Pittsburgh, as they have come before this subcommittee.

Mr. BARTON. I think you have introduced everybody from your hometown.

Mr. DOYLE. Well, today I am pleased that we are going to hear from Dr. Bernard Goldstein. Dr. Goldstein currently serves as the Dean of the University of Pittsburgh's graduate School of Public Health. He comes to the University of Pittsburgh as the next step in a distinguished career in academia and government.

Most recently, Dr. Goldstein was the director of the Environmental and Occupational Health Science Institute, which is a joint program of Rutgers, the State University of New Jersey, and the University of Medicine and Dentistry of New Jersey Robert Wood Johnson Medical School.

In the early and mid-eighties he served as Assistant Administrator for Research and Development for the EPA, and he has also served as a member or chairman of a number of committees that were part of NIH, EPA and the World Health Organization. He is also the author of over 200 articles and book chapters relating to his primary field of expertise in environmental health sciences and public policy.

I am confident that Dr. Goldstein's testimony will prove invaluable to us as we begin to examine the multitude of issues surrounding the history and future of the Clean Air Act. Welcome to the subcommittee, Dr. Goldstein, and thank you for being here today. And, Mr. Chairman, thank you.

Mr. BARTON. We thank you for the introduction, and we welcome you, Dr. Goldstein. Before we allow each of you to testify, we will stipulate that all of you have glowing resumes, and we will put those in the record and stipulate there is some Member of Congress that would love to come introduce you just as well as Mr. Doyle did Dr. Goldstein.

I will say that, when I saw you, Dr. Goldstein, the First Lady's Chief of Staff is a woman that used to work for me, Andrea Ball, and her husband is Lonnie Ball. He is a water well contractor, a drilling contractor, and heat pump equipment rep in Austin, Texas, and you and he are twins. I actually thought what is Lonnie Ball doing in this hearing room, when I saw you.

So at some point in time, we will try to get you invited to one of the White House soirees, and you can meet Lonnie and Andy, because you and Lonnie look unbelievably alike, unbelievable, and he is a handsome man, just like you. So I don't mean that in a negative way.

Each of your testimony is in the record in its entirety.

Mr. BARTON. We are going to start with Dr. Goldstein. I will give each of you 5 minutes to summarize your testimony orally, and then we will have questions for this panel. So, welcome, all of you, and we start with Dr. Goldstein.

STATEMENTS OF BERNARD D. GOLDSTEIN, DEAN, SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF PITTSBURGH; JOSEPH GOFFMAN, ATTORNEY, GLOBAL AND REGIONAL AIR PROGRAM, ENVIRONMENTAL DEFENSE; JAMES LENTS, ENVIRONMENTAL POLICY, ATMOSPHERIC PROCESSES AND MODELING LABORATORY, UNIVERSITY OF CALIFORNIA AT RIVERSIDE; ALAN KRUPNICK, SENIOR FELLOW AND DIRECTOR, QUALITY FOR THE ENVIRONMENT DIVISION, RESOURCES FOR THE FUTURE; AND DAVID M. DRIESEN, ASSOCIATE PROFESSOR, SYRACUSE UNIVERSITY COLLEGE OF LAW

Mr. GOLDSTEIN. Thank you, Mr. Chairman. Just another delightful reason to move to Pittsburgh.

Let me begin by stating that from a public health viewpoint, the Clean Air Act has been highly successful. At your invitation, I am limiting my remarks to the hazardous air pollutant provisions. For this section, Section 112, it is still unclear whether the public health benefits have kept pace with the rest of the Clean Air Act.

I believe the question of benefits from Section 112 exemplifies an issue related to actions taken under the precautionary principle. That is a principle that you will be hearing much more about in your coming debates. One of the many definitions, an early one from the Rio, is that, where there are threats of serious or irreversible damage, scientific uncertainty shall not be used to postpone cost effective measures to prevent environmental degradation.

The precaution principle is evident, even though it wasn't discussed at the time, in the hazardous air pollutant amendments in 1990 in that the amendments came about largely because of frustration with the slowness of the previous risk based, science based approach.

It is evident in that the burden of proof was shifted away from the requirement that EPA find an agent was harmful at ambient levels and shifted to the requirement that 189 compounds should be controlled unless they were proven harmless. Third, the maximum available control technology was required, relegating the previous selective risk and science based approach to secondary importance.

The claim that the new approach would be faster and cheaper is difficult in retrospect to support, in view of the delays and the cost in establishing the regulations. The complexities of MACT regulations were simply not anticipated, but most importantly, has it worked in terms of improving public health?

The good news is that we can certainly expect a decrease in total tonnage of chemicals released into air. However, inherent in the precautionary approach is that we really do not know to what extent these chemicals will have had an impact on public health. By requiring maximum available control technology, we probably will reduce the emissions of known human cancer causing chemicals

such as benzine, which causes leukemia, but these were already regulated under the previous risk based approach.

For almost all of the newly regulated chemicals, there is really no evidence that they produce harm at outdoor levels, and in some cases, such as toluene, there is sufficient data to suggest that there is really no reason for concern.

Certainly, reducing exposure to these compounds can be justified on prudent public health grounds, but by definition one cannot do a cost-benefit analysis when there is no evidence on which to claim benefit, and this is in contrast to the NAAQS pollutants for which there is a rich data base on which documentation can occur.

Other problems related to the precautionary approach to hazardous air pollutants includes the lack of an incentive to improve control technology, once we have established maximum available control technology. It is sort of establishing what we call CATNIP. CATNIP is a technical term. It stands for the cheapest available technology not involving prosecution.

How do you get better technology, once you are into MACT, and that is a question which perhaps can be dealt with, but right now it is difficult, considering the fact that we have traditionally built our new control technology on advances on basic science and technology. Why would one invest once the MACT had been established?

There are other problems. We have the same level of control for compounds that we know are problems, such as benzine, as we do for toluene. That can be a potential problem. But perhaps the most important long term public health problem is the disincentive to invest in research to find out the truth about the chemicals we are regulating.

EPA's budget in this area has plummeted, its research and development budget, and we really need to do a lot more to accomplish our public health goals by finding out exposure and effect indicators that are far simply superior to simply measuring pounds of pollutants. So I urge additional support to this type of research.

The 1990 Clean Air Act HAP amendments also raise two public health issues unrelated to the precautionary principle. On a public health basis, purely looking at this from public health, it is hard to justify an emphasis on outdoor air, when the highest human exposure levels to most of these compounds occurs indoors. EPA is approaching indoor air pollution, but certainly not at a level commensurate to the expense, to the force that's been put in the exposure to outdoor pollutants.

Second, the residual risk provisions of the Clean Air Act are based solely on risk to the maximally exposed individual rather than incorporating standard public health population based approaches. One can get gross underestimates of the actual public health impact. One can get such silliness as regulating in a situation in which literally there will be one adverse effect every 17.5 million years. That is a situation which is about 10 times longer than people have been on the planet.

Let me conclude by being sure that my critique of the public health impact of the HAP provisions is not misunderstood. The inability to prove a benefit is a common problem in public health. We all agree that prevention is valuable.

Sometimes we have to fall back on the well known 16 to 1 benefit cost ratio for primary prevention. That is based upon an ounce of prevention is worth a pound of cure. We have learned in public health that to extract that sixteenfold benefit requires highly efficiency approaches focused on the major threats, using the best available science. In that regard, our approach to the 1990 hazardous air pollutant amendments has some unfortunate shortcomings.

Thank you, Mr. Chairman.

[The prepared statement of Bernard D. Goldstein follows:]

PREPARED STATEMENT OF BERNARD D. GOLDSTEIN, DEAN, GRADUATE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF PITTSBURGH

INTRODUCTION

Mr. Chairman, Members of the Committee. Thank you for inviting me to give a public health viewpoint on the impact of the hazardous air pollutant provisions of the 1990 Clean Air Act Amendments. With your permission, I would like to submit written remarks for the record and to summarize them in my oral testimony.

My name is Bernard Goldstein. I am a physician and an environmental health scientist, and am currently Dean of the University of Pittsburgh Graduate School of Public Health, one of the nation's largest schools of public health. I have had more than thirty years of experience in studying and commenting on the health effects of air pollutants, including serving as Assistant Administrator for Research and Development of the US Environmental Protection Agency under William Ruckelshaus and Lee Thomas, and chairing the Congressionally mandated Clean Air Scientific Advisory Committee.

ISSUES RELATED TO THE PRECAUTIONARY PRINCIPLE

In discussing the public health impact, I believe it helpful to frame the 1990 HAP amendments in terms of the Precautionary Principle. This is a relatively new term, embodying an evolving and as yet not well-defined set of concepts that is increasing in prominence among environmental and public health advocates. One definition, provided in the 1989 Rio Declaration, is:

> "Nations shall use the precautionary approach to protect the environment. Where there are threats of serious or irreversible damage, scientific uncertainty shall not be used to postpone cost-effective measures to prevent environmental degradation"

The more recent formulations have tended to extend the precautionary principle to public health. In some cases there has been a weakening of the emphasis on cost effectiveness and on the extent of adverse impact needed to invoke the precautionary principle.

You will hear much more about the Precautionary Principle, not the least because it is being heavily advocated by the European Community, perhaps as a rationale for trade barriers on US products. Although not discussed as such at the time, the 1990 amendments to Section 112 of the Clean Air Act governing the control of hazardous air pollutants contain a classic use of the precautionary principle. First, the amendments are derived from a sense of frustration with the slowness of a risk based scientific approach—relatively few of HAPs had been regulated. Second, the burden of proof is shifted as is evident from Congress listing 189 pollutants and limiting EPA's role to one of removal of a pollutant from the list based upon proof of no harm, which replaced the previous dependence upon a finding of harm to be listed for regulation. Third, there is a requirement of maximum available control technology for pollutant control of all sources, relegating the previous selective risk-based approach to secondary importance.

But has it worked? In 1990 advocates of this new approach claimed it would be "faster, better, cheaper". It is hard to argue that it has been faster or cheaper, given how long it has taken to write the regulations and how much it has cost to do so, as well as the toll that uncertainty always has on the market place. However, the key question is whether the 1990 CAA HAP Amendments have improved public health.

Let me start with the positive. We do know that many tons of HAPs have been or will be removed from the air. However, we know little about how much of a health difference this has made. One of the guiding concerns in the control of HAPs is that of human cancer. Almost all of the pollutants that were known or reasonably

anticipated to cause cancer or to have other adverse effects at ambient air levels had been regulated before the 1990 CAA amendments. These amendments have led to more stringent contol on at least some of these pollutants through requiring maximum available control technology. To the extent that these controls can be quantified (e.g., reduction in the emissions of benzene, a known cause of human leukemia), some estimate can be made of the additional benefit of the MACT provision. However, this will not be possible for almost all of the newly regulated pollutants on this list.

The reason there is so much uncertainty about health benefit for almost all of the pollutants listed by name as HAPs in the 1990 CAA Amendments is inherent in the precautionary principle. Simply put, you can not know what harm has been averted if you regulate pollutants without some degree of proof that they are harmful. As a corollary, the congressional requirement in the Clean Air Act that EPA perform cost-benefit analysis, which can be done for NAAQS pollutants, can not be achieved for those HAPs for which there is no evidence of benefit, despite the substantial cost in controlling these pollutants. And almost all of the HAPs for which there is sufficient evidence of harm to provide the basis for a benefit analysis were regulated under the pre-1990 Section 112 rules.

If we really want to know the public health benefits of regulating this broad list of agents, we must develop benefit indicators that go beyond the simple measure of tons of pollutants. Using pollutant weight, as does our HAP regulations, rather than pollutant effect, can be problematic, particularly where there is a clear differential among these pollutants in their potential for toxicity. Removing a ton of toluene from air emissions is probably meaningless in terms of public health, while removing a ton of benzene is very likely to be of direct health benefit. The current approach to HAPs focuses the same attention on both. Better indicators of the potential for adverse health effects are needed if we are to develop cost-effective approaches to hazardous air pollutants, particularly as for many of these pollutants the outdoor exposures regulated by the CAA are relatively trivial compared to indoor exposures.

Another area of concern about the precautionary principle is often is antithetical to scientific research that gets to a true understanding of cause and effect relationships. The central principles of toxicology are that chemicals have very specific actions within the human body and that they vary greatly in the dose that causes the action. They are the basis for two of the components of risk assessmen—hazard identification and dose response assessment. These principles are no more complicated than saying that aspirin works for a headache but not for constipation, and that a very tiny grain of aspirin will have no effect while too much can kill. By treating all of the 189 chemicals on the list as exactly the same in terms of specificity of action and dose responsiveness, the CAA Amendments simply ignore these toxicological principles. There is no question that avoidance of any possible effect of any of these agents could be preventive—there is also no question that this shotgun approach inherent in the precautionary principle is less than a fully efficient means of dealing with the potential public health consequences of HAPs.

There is work under way attempting to develop better indicators of air pollutant health effects. In fact, EPA Administrator Whitman provided major leadership in this area while governor of New Jersey and now at EPA. I wish to particularly commend the research activities supported by various government agencies including the National Institute of Environmental Health Sciences, the CDC Center for Environmental Health and by the EPA's Office of Research and Development, and to encourage Congress to enhance support for these approaches.

There is another problem inherent in the precautionary principle approach to HAPs. This is a paradox built into the MACT approach. The goal is to achieve the lowest possible levels of pollution control by specifying the best available control technology today (actually defined as the "best performing 12% of existing sources"). But once having done so, once having spent better than a decade writing the regulations guiding the use of the specific technology, how do you get better control technology? Pollution control technology is an applied field, usually borrowing from advances in basic technology that are then utilized to meet the demand for pollution control. But what demand will be left after the regulations are completed? Thus a potential negative of the MACT approach is that it leaves little likelihood that there will be continued improvement in control technology.

One other aspect of the potential public health impact of a precautionary principle approach is also difficult to quantify. This is the extent to which the misplaced emphasis on unnecessary public health actions limit the availability of resources for needed public health activities. Our national public health infrastructure is under tremendous pressure. We have taken for granted many of the advances in public health. These advances have been sustained by a highly efficient workforce that had

been stretched to the limit even before September 11th. This workforce needs reinforcement, it needs to have a greater level of support for its activities and our nation needs more focus on how we will replace those already in the field. In making your judgments as to where to place needed public health resources, I urge you to give high priority to the workforce infrastructure.

ISSUES NOT DIRECTLY RELATED TO THE PRECAUTIONARY PRINCIPLE

There are two issues concerning the HAP provisions of the 1990 CAA Amendments that are directly related to public health but do not clearly fall under the heading of the Precautionary Principle: the relative lack of emphasis on the major public health threat of these chemicals, that of indoor air pollution; and in calculating residual risk, the inappropriate sole focus on the Maximally Exposed Individual rather than also on the total population.

Public health principles for hazardous chemicals require us to focus on the highest levels of exposure to the most toxic agents. In general, for HAPs this is exposure in the home to HAP compounds that were already regulated before 1990. Thus, there is a disconnect between the major public health concern about these chemicals and the emphasis that the CAA puts on their control.

Risk assessment remains a part of the regulation of HAPs in the form of a residual risk estimation. Unfortunately, the risk assessment approach specified is not in keeping with public health practice in that the risk estimate is driven by the Maximally Exposed Individual rather than the population at risk. This is both an inappropriate and an inefficient way to protect public health. Population based approaches should be the primary driver in risk based approaches with risk to the Maximally Exposed Individual also being calculated to be sure that no one individual is particularly at risk. Just one of the many problems in using the MEI as opposed to the population based approach is that we in essence assume that the MEI lives at the fence line of the source 24 hours a day, 7 days a week, for 70 years. This simplifying approach is true if we assume that someone is at that location as part of a population based risk estimate, but it is a gross and highly variable overestimate to assume that a single individual gets that full 70 years.

Moreover, one can readily demonstrate the silliness of the reliance on the MEI with a paper experiment. Assume that there is a plant at the edge of a rural area such that only one family of four lives immediately downwind and that it has a life time cancer risk of one in one million due to these emissions. Assume further that this plant goes on emitting the same level of pollutants ad infinitum, and this family of four is replaced every 70 years by another family of four. The time period during which one cancer case is expected to occur is 17.5 million years, or roughly one case during a period about ten times longer than humans have existed on this planet. This needs to be changed.

So as to be sure that my critique of the public health impact of the HAP provisions is not misunderstood, let me emphasize that the inability to prove a benefit is a common issue in public health. We all agree that prevention is valuable, and that sometimes we have to fall back on the well-known 16:1 cost benefit ratio for primary prevention. This is based on an ounce of prevention is worth a pound of cure. We have learned in public health that to extract that sixteen-fold benefit requires highly efficient approaches focused on the major threats using the best available science. In that regard, the 1990 HAP amendments have unfortunate shortcomings.

Mr. BARTON. Thank you.

We would now like to welcome Mr. Joseph Goffman, who is an attorney for the Global and Regional Air Program for the Environmental Defense Fund in New York. Your testimony is in the record. We ask that you summarize it in 5 minutes. Welcome to the subcommittee.

STATEMENT OF JOSEPH GOFFMAN

Mr. GOFFMAN. Thank you, Mr. Chairman. I am very grateful to you and the subcommittee for your invitation to testify today about the Clean Air Act amendments of 1990, in particular, Title IV, the provisions that established the national cap and trade program for power plant SO_2 emissions as a key precursor of acid rain.

President George Herbert Walker Bush first introduced the cap and trade model when he introduced this proposal, and this model has been enthusiastically embraced by both of his successors as they have moved forward to address a variety of pollution control challenges. It is a very interesting coincidence that three different administrations have now stepped forward to support this proposal.

I think that the results of the SO_2 program so far explain perhaps that this is more than a coincidence. First, the SO_2 program passes the "greener, faster, cheaper" test that long has been the Holy Grail of just about everybody in the environmental policy community. The SO_2 program passes the "keep it simple" test, defying critics' claim that only complex, intrusive environmental laws and regulations can deal with pressing environmental challenges.

The SO_2 program passes the "right tool for the job" test in the case of acid rain and, by extension, the case of other environmental problems that involve long range transport of pollution. Indeed, the SO_2 program has proven to be a perfect complement, not a replacement but a complement, to the fundamental structure of the Clean Air Act as embodied in the various authorities of Title I.

Cap and trade, in short, is a vitally important, even indispensable tool in the toolbox of pollution problem solving. Even so, the success of any air pollution program, including one based on cap and trade, depends both on setting the emissions reduction targets at levels low enough to solve the environmental problem and on ensuring that the cap and trade tool works in harmony with other tools in a fully complementary fashion.

The virtue of cap and trade is not as an end in itself, but is that it simply makes it easier to reach the right pollution reduction levels, assuming those are established by law, and to harmonize multiple pollution control programs and strategies.

I think that the single most important reason that cap and trade has achieved the current level of credibility that it has in the last 10 years is reflected in the fact that, in formulating his initial proposal in 1989, President George Herbert Walker Bush harvested part of the cost savings expected to result from the acid rain emissions trading program to create an environmental dividend.

That is, when he put forward his proposal, he explicitly supported an emission reduction target of 10 million annual tons of reductions, not just 8 million tons. That is, he went to a target that was 25 percent more ambitious and more in line with contemporary scientific understanding at the time of what was needed to address acid rain than the targets proposed in alternative legislation then pending in Congress.

His proposal also included for the first time an explicit cap on emissions, again something that was made uniquely possible by the flexibility built into the emissions trading approach. This fundamental insight of the first President Bush is the most important reason—I think it is the reason—that we are still talking about cap and trade 13 years later. The insight was that cap and trade programs can and must deliver more environmental bang for the buck.

What that means is that, as you move forward to consider other proposals, not the least of which is the current President Bush's

Clean Skies initiative, this historical fact is going to be in the background of every proposal you evaluate.

The Clean Skies proposal legislation pending in the Senate seem, in both cases, to be based on a classic cap and trade model, which means that the polluting sources will have a full opportunity to take advantage of market based emissions trading to yield significant cost savings.

In contrast with the first Bush Administration's decision to share some of those cost savings, dividends, with the environment, the current administration's ultimate reduction goals seem to feel—in fact, they do fall noticeably short and late of delivering on the promise of attaining the health based standards for fine particles and ozone.

Nevertheless, thanks to the first President Bush's fundamental decision, the public is going to be asking where is the environmental and public health dividend that should be yielded by the expected cost savings of the cap and trade approach.

Mr. BARTON. Could you summarize?

Mr. GOFFMAN. Yes. The last three sentences.

The historical precedent set by the President's father of yoking the cost savings of emissions trading with an environmentally relevant reduction target presents the permanent foil against which all future proposals are going to be evaluated. The power of cap and trade programs inheres in their ability to link synergistically through emissions trading markets cost savings and superior environmental performance, but that link, that synergy, cannot be achieved unless such programs are based on emissions reduction targets that are truly capable of addressing the needs of public health and the environment.

In this case, we are probably talking about a 2 million ton SO_2 cap and a 1.1 million to 1.25 million ton NO_X cap in the case of those two pollutants by the end of this decade.

Thank you.

[The prepared statement of Joseph Goffman follows:]

PREPARED STATEMENT OF JOSEPH GOFFMAN, SENIOR ATTORNEY, ENVIRONMENTAL DEFENSE

INTRODUCTION

My name is Joseph Goffman. I am a senior attorney with Environmental Defense. I am most grateful to the Subcommittee for its invitation to testify today and am most appreciative of the careful and deliberate approach it is taking in reviewing the development of the Clean Air Act.

The focus of my testimony today will be Title IV of the Clean Air Act Amendments of 1990, in particular those provisions that established the national cap and trade program for power plant sulfur dioxide (SO_2) emissions, a key precursor of acid deposition.

Some would find it a challenge if asked to name an important public policy approach on which President George H.W. Bush, President Bill Clinton and President George W. Bush all shared an identical position. Students of environmental policy, however, would have no trouble. As President, each of these leaders put forward in major presidential addresses, and then pressed ahead with, high-profile environmental proposals that were centered on a cap and trade system.

While cap and trade embodies certain principles that many see as reflecting a distinctively American philosophy, the international community has begun to embrace this approach in its effort to reduce greenhouse gas emissions. Perhaps even more striking is the fact that national and provincial environmental policy-makers in the Peoples Republic of China are in the process of fashioning a regional SO_2 emissions trading program modeled on the US cap and trade approach.

Looming on the horizon in this country are a series of potentially daunting new public health and environmental challenges posed by current levels of air pollution. Despite the evident emissions reduction success of the 1990 SO_2 program, acid rain continues to plague sensitive ecosystems from the Rockies to the East, and visibility-marring haze blights our national parks and monuments. Tens of millions of Americans breathe air made unhealthful by ozone smog and particulate matter—and, even in the wake of his rejection of the Kyoto Protocol, President Bush pledged to continue to focus on the issue of climate change, including consideration of more broad-based policies within the next ten years.

As it turns out, electric power plants are a chief source of the range of pollutants and gases directly implicated in all of these problems. In February, when he put forward his Clear Skies Initiative (CSI), President Bush ensured that both power plants and the cap and trade model would be at the center of any future debate about how to address this suite of air pollution challenges.

If that is the case, then it is vital for this subcommittee, as one of the prime movers in such a debate, to evaluate the US experience, so far, with the use of the cap and trade tool to curb power plant pollution.

Fortunately, we are now 12 years on in what, during the '90's many referred to as the world's largest public policy "experiment" with market-based regulation. Thanks to its own work in 1990, this Committee can examine the results and apply the lessons of the SO_2 cap and trade program to its efforts going forward to combat air pollution.

Let me sum up my views on those results:

1. The SO_2 program passes the better-faster-cheaper test that long has been the Holy Grail of just about everybody in the environmental policy community.
2. The SO_2 program passes the "keep-it-simple-stupid" test.
3. The SO_2 program passes the right-tool-for-the job test; indeed, it has proven to be the perfect complement—as opposed to replacement—to the fundamental structure of the Clean Air Act, as embodied by Title I of the Act.
4. Cap and trade is a vitally important tool in the toolbox of pollution problem-solving. Even so the success of any air pollution program, including one based on cap and trade, depends both on setting the emissions reduction targets at low enough levels to solve the problem and on ensuring that the cap and trade tool works in harmony with other vital tools. The virtue of cap and trade is simply that it makes it easier to reach the right pollution reduction levels and to harmonize multiple pollution control programs and strategies.

I. Faster, Cheaper and Greener: Performance Results

From 1995 to 1999, or the period known as "Phase I," the acid rain program yielded impressive environmental and economic results. Phase I power plants reduced their SO_2 emissions far below the level that was legally allowable under all of the provisions of the program. Furthermore, in response to the economic dynamics created by the "cap and trade" design of the program, these plants released substantially less pollution relative to the more stringent level of "base" allowable emissions established by Congress. At the same time, the SO_2 emissions trading market has done what markets do best: drive down costs.

- While achieving *100% program compliance* during Phase I, power plants reduced SO_2 emissions 22% more than the restricted number of "base allocations" initially allotted to them by Congress, equal to 7.3 million tons of *extra emissions reductions.*
- When factoring all types of emissions allowances included in the program, including those for auction and performance incentives, actual emissions were 30% lower than the amount that was legally allowed, equal to 11.6 million tons of unused allowances.
- The *extra reductions* in emissions were distributed across 22 of the 24 states whose power plants have participated in Phase I, and many of the highest-emitting sources—such as those in Ohio, Indiana, Georgia, Pennsylvania, West Virginia, and Missouri—made the greatest number of cuts in emissions.
- The extra reductions, which represent a concrete economic asset because of the banking and trading provisions of the program, have occurred in the absence of any federal or state action to restrict the saving or transfer of allowances.
- The cost of SO_2 reductions, as reflected indirectly in the price of traded SO_2 emissions allowances, is far below the cost predicted during the initial debates on the program.
- Despite the rapid fall in SO_2 emissions over the past five years, both electricity generation and the United States economy experienced strong growth during the same period. Thus the results of the program offer more evidence to disprove the supposed link between economic growth and emissions growth.

- Reductions in sulfate deposition have been observed in geographic areas affected by atmospheric transport of sulfur.

The superior environmental and economic results of Phase I of the SO_2 program are precisely what should have been expected of a program that matched an explicit emissions limit with a market that turned pollution reductions into marketable assets.

Year 2000, the first year of Phase II, continued these trends for the most part. One significant feature of compliance in 2000 was that some utilities drew from the "bank" of extra Phase I reductions to offset emissions above their nominal target levels. Overall, however, SO_2 emission in the highest-emitting regions continued to fall.

II. Faster, Cheaper and Greener: Acid Rain Politics of '89-'90

The notion of using emissions trading as part of the implementation of national SO_2 emissions reductions was formally unveiled in June 1989 in a speech by President George Bush, when he introduced his administration's overall proposals for amending the Clean Air Act. At the time, emissions trading was highly controversial among both environmental advocates and the public at large.

The controversy was sparked because the initial focus of the ensuing debate revolved around emissions trading as a "market mechanism" and as a method for reducing compliance costs. To many, these were but shorthand for "industry loophole."

In 1989 and 1990, the issue of cost remained the pivotal point of the political debate. In the end, however, the link between emissions trading and cost savings played to the environment's advantage. Initially, the Bush administration's economic analysts were leaning toward supporting a reduction target of only 8 million tons. Moreover, legislation introduced in early 1989 and in previous Congresses had mandated an annual reduction in SO_2 emissions of only 8 million tons. It was the promise of cost savings through emissions trading that persuaded the Bush administration to propose in its Clean Air legislation that the SO_2 program stipulate an annual reduction of *10 million tons*.[1] President Bush's insight was that the country could afford a greater level of environmental protection, given that the use of emissions trading would yield the lowest compliance costs possible. The shift from an 8-million-ton annual reduction target to a 10-million-ton target was especially important. The 10-million-ton target was much closer to the reduction level first suggested by the National Academy of Sciences as that required to curb acid deposition. With a Republican president sending a 10 million-ton bill to a Democrat-led Congress, the enactment of the more stringent target was all but ensured. Thanks to the anticipated cost savings of emissions trading, the final legislation required the additional 2 million tons of annual SO_2 reductions.

Perhaps even more important, the inclusion of emissions trading led to another environmental victory. Throughout the 1980s, the environmental community and some of its congressional champions had sought to craft acid rain legislation that both reduced SO_2 emissions and *capped* total emissions at the reduced levels. None of these efforts succeeded. In legislation sent to Capitol Hill in July 1989, however, the Bush administration included the critical elements of just such a cap, which was made possible only by the operational flexibility offered to companies by emissions trading. In the ensuing legislative process, the Senate Committee on Environmental and Public Works (and subsequently the full Senate and the House of Representatives) used the allowance allocation system to construct a truly comprehensive emissions cap.

III. The Clear Skies Initiative: What Happened to Faster, Cheaper, Greener?

Against this historical background, some of the criticism of the President's Clean Skies Initiative may seem more understandable. The CSI proposal seems to be structured in a way that will allow power plants to take full advantage of the cost-savings opportunities afforded by an emissions trading market. In contrast with the first Bush administration's decision to share some of the cost-savings dividend with the environment in the form of an additional 2 million tons of reductions, the current administration's ultimate reduction goals fall noticeably short—and late—of delivering on the promise of attaining the health-based standards for ozone smog and fine particles. Where, critics are asking, is the environmental and public health dividend that should be yielded by the expected cost-savings?

This question is more than rhetorical, as the "environmental dividend" is likely to mean the difference between success in attaining the national ambient air quality standards (NAAQS) for ozone and fine particles and failure. As in the case of the 10-million-ton target for acid rain, the level and timing of reductions required under

[1] Tom Wicker, "Who'll Stop the Rain?" *New York Times,* 16 June 1989, A27.

any national cap and trade program for power plant SO_2 and NO_X emissions will have a *direct bearing* on the capacity of metropolitan areas across the country to attain the health-based standard for ozone and fine particles. To be sure, by itself a national cap and trade program for power plant SO_2 and NO_X reductions will not ensure attainment of the fine particle and ozone NAAQS in every area. At the same time, unless such a program achieves the full measure of cost effective reductions from this sector, the prospects of attaining the NAAQS will be extremely remote in many high-population communities.

Recent press reports, such as that in last Sunday's *New York Times* indicate, for example, that EPA analysis points to the necessity of achieving SO_2 and NO_X reduction levels and timetables beyond those included in the CSI if the NAAQS are going to be attained as required under current law. It is widely believed that the EPA analysis referred to in the *Times* story demonstrated that an SO_2 emissions cap in the 2.0 to 2.25 million ton range and a NO_X cap in the 1.25 million ton range were essential both to addressing acid rain and to attaining the fine particle and ozone NAAQS. In addition, current law appears to impose a deadline for attaining the fine particle and ozone NAAQS in 2009-10 time period.

These targets and this timetable contrast unfavorably with those in the President's CSI. In addition, the historical precedent "set by the President's father—of yoking the cost-savings of emissions trading with an environmentally relevant reduction target presents yet another unfavorable contrast as well. The power of cap and trade programs inheres in their ability to link synergistically—through emissions trading markets—cost-savings and superior environmental performance. That synergistic link cannot be achieved unless such programs are based on emissions reduction targets that are truly capable of addressing the needs of public health and environmental protection. It would seem that EPA's analytic focus on a 2—2.5 million ton SO_2 cap and a 1.25 million-ton NO_X cap points to the target levels needed for a successful multi-pollutant cap and trade program.

Keeping It Simple: A New Regulatory Paradigm

The SO_2 program is first and foremost an emissions reduction program. What set the program apart from other Clean Air Act programs is that the reduction was implemented as an annual SO_2 emissions budget—literally a "cap" on total SO_2 emissions from power plants—at levels substantially lower than those of the 1980s. This approach was unprecedented, as existing air pollution regulation at the time relied on specific technical or operational requirements on sources, usually resulting in a restriction on the *rate* of emissions discharge, not on *total* discharges. Although such requirements were based on projections of actual emissions reductions, fixed levels of total reductions were never explicitly mandated. Consequently, as long as sources met their operational requirements, they were not held responsible if the projected levels of emissions reductions were not met.

Under the SO_2 program, however, the Environmental Protection Agency (EPA) distributes to each power plant a fixed number of emissions "allowances," each of which gives the owner the authorization to emit one ton of SO_2 at any time. A plant may then sell the allowances to another plant (or to any interested buyer, including environmental groups and speculators) provided that at the end of the year it surrenders to the EPA enough allowances to cover its emissions for that year. Allowances that are not used to cover emissions in one year may be saved for use in later years, which is known as "banking." Because the number of emissions allowances the EPA distributes every year is fixed, then, by definition, an allowance remaining in excess of a plant's emissions represents an "extra" reduction that may be transferred to another plant to cover its incremental emissions. No matter how many or how few allowances are transferred total emissions *always* remain at or below the cap. The law requires each power plant to install continuous emissions monitors and to report the results on a quarterly basis to the EPA. The EPA is required, in turn, to operate an emissions and allowance tracking system, which has ensured the transparency and sound record-keeping needed to make the program successful.

Phase I of the acid rain program mandated participation by the largest emitters of SO_2—specifically, 263 sources at mostly coal-burning electricity plants (located primarily in eastern and midwestern states). They were joined by additional sources that voluntarily chose to participate in Phase I rather than wait until Phase II, as allowed under certain provisions of the legislation. The total program budget, or cap, for 1995 included 8.7 million tons worth of allowances. By 1999, the budget gradually decreased to roughly 7 million tons as a result of the phase-out of provisions designed to promote certain control options and investments.

Phase II, which began in January 2000, imposed more stringent emissions limits on the units participating in Phase I. In addition, Phase II also established caps on SO_2 emissions for virtually every other power plant in the continental United States

(any with output capacity of greater than 25 megawatts) as well as all new utility units, thus bringing the total universe of regulated units to more than 2,000. The annual budget for these sources was set at 9.2 million tons. It will continue at that level until 2010 when the cap drops to a permanent level of 8.95 million tons, a level roughly equal to 50% of electric utility emissions in 1980.

In 1989, the rhetoric surrounding SO_2 emissions trading emphasized "market mechanisms," "economic incentives," and "cost-savings." Less apparent, but equally significant, is that in the process of establishing the SO_2 program, Congress ended up creating a new paradigm for pollution policy. That paradigm managed to overthrow the traditional discretionary powers of environmental regulators even while making it more certain that the full measure of promised emissions reductions would be delivered to the public and the environment.

Between 1970, when the "modern" Clean Air Act was first adopted, and 1990, programs to control air pollution were characterized by requirements focusing on *how* sources of emissions operated. State and federal regulators were empowered and called on to assess the cost, feasibility, and effectiveness of various technologies, methods, and processes for reducing emissions from the operations of various classes of sources.

On the basis of those assessments, regulators would impose either specific technology requirements or operational parameters such as emissions rates. Compliance was defined in terms of meeting those operational parameters, not in terms of meeting specified emissions reduction targets. Often, plants were subject to detailed operating permits, and enforcement resources went toward ensuring that plants developed and submitted compliance plans and met the operational milestones delineated in the plans, rather than focusing on actual emissions performance. To a significant extent the approach worked. According to many key indicators, air quality in the United States improved substantially.

By 1990, however, the performance of the traditional approach was often burdened by a broad range of flaws. In many cases, the full increment of pollution reductions that had been promised, predicted, or assumed when operational requirements were adopted had not been achieved. Because compliance was defined simply in terms of technologies or operating parameters, however, nobody, including the polluters themselves, was legally accountable for the failure to achieve the expected levels of total reductions. With fewer than the expected and needed pollution reductions achieved, key ambient air-quality standards were often not attained. Specifying technologies or operating parameters was not enough to limit total emissions discharges.

At the same time, the costs of these programs were high. The regulatory community's resources often were inadequate for collecting and processing the range of information needed to formulate operational requirements for whole classes of sources. As a result, once the requirements and implementing permits were put in place, the capacity to absorb new information and respond to inevitable and ongoing economic and other operational changes was virtually nonexistent. Although the characteristics of sources varied, requirements tended to be uniform and thus many sources were subject to expenses that could have been avoided in more flexible systems. Simultaneously, sources that could have adopted more effective or innovative control technologies had no incentive to do so. At the same time, regulators, mindful of the need to control costs, compromised the stringency of requirements either in setting the standards or in negotiating individual permits and "variances" to permits, all at the cost of total emissions reductions achieved.

In contrast, the SO_2 program replaced the regulator with the polluter itself as the pivotal actor in compliance, overthrew the traditional paradigm, and replaced it with a new one. Under the SO_2 program, the pollution sources are legally accountable for achieving a specified level of emissions reductions and for little else save continually monitoring and reporting their actual emissions. The only job that regulators have to do is ensure that each source meets its monitoring and reporting requirements and that its actual annual emissions equal the number of allowances the source holds.

How power plants reduce their SO_2 emissions has been left completely to the discretion of the plant operators themselves. As a result, it is up to them to manage the continually changing economic, technical, and other circumstances in which they are operating and to integrate their basic business activities with their obligation to meet their emissions cap. The burden and the opportunity of lowering costs are placed squarely on the power plants operators. In place of variances and other cost-relieving methods that entail compromise of standards and forego actual emissions reductions, plant operators under a cap and trade system must turn to emissions banking and trading for cost control. Because of the built-in cap-based structure of the program, cost savings through emissions trading in no way lessens the amount

of total emissions reductions or their environmental.benefit. Today, the EPA proudly embraces the very coup that, at least as far as SO_2 is concerned, stripped it of much of the scope of its traditional regulatory power. Noting that the acid rain program embodies the highest ratio of tons of pollution reduced to administrative resources expended, the agency reports approvingly that the program produced 100% compliance—all while giving regulators far less authority to exert direct control over the methods of compliance.

V. Keeping it Simple: One Key to Economic Success

Critical to the character and success (and not just the mechanics) of the program is the fact that the aggregate number of allowances circulated every year is fixed, or capped. As a result of this design, power companies must plan for economic growth and change while operating against a limit on their total SO_2 emissions. This cap and trade regime gives utilities a direct financial incentive to reduce emissions below required levels. Extra reductions, in the form of unused allowances, give companies flexibility to offset increases in emissions in one location with reductions in another. In addition, utilities can optimize control by reducing emissions when it is least expensive to do so and then bank the surplus allowances for future use or sale. Consequently, extra reductions give power plants the flexibility needed to respond to economic demands and opportunities while meeting their compliance obligations under the cap. Where extra reductions are achieved, the environment benefits from less pollution at an earlier time than required by law. Furthermore, through emissions trading, power companies have both the incentive and the means to find the lowest-cost ways of achieving compliance anywhere within the entire electricity system and to reap financial rewards for developing those means. Under this program, each power plant can choose between various compliance alternatives, for example, using low-sulfur fuel, investing in energy efficient technologies, chemically removing sulfur from smokestack emissions, or acquiring allowances from other utilities that can make reductions more cost-effectively. By including emissions trading in the full suite of compliance options open to power plants, the program enhances the ability of the interlocking emissions and electricity markets to find the most efficient responses. The SO_2 emissions trading market has been effective in reducing costs because it has fostered implicit or "latent" emissions trading as well as active trading. Put another way, emissions trading places all compliance options in direct competition with each other. Of course, any program that permits flexibility in compliance choices does this. Because of emissions trading, however, that competition is geometrically expanded in the SO_2 program. Different compliance options do not compete with each other only at any one facility. Because emissions trading allows a facility operator to choose to apply a compliance option at its own site or, in effect, at any other affected facility that can make surplus emissions allowances or reductions available, the facility operator's range of choices are much broader, the competition among them much more intense, and the capacity of that competition to lower costs much, much greater.

As a result, the different compliance alternatives have been forced to compete with one another even more vigorously. The expected result has occurred: compliance costs have been driven steadily downward.

By fundamentally transferring the decision of how to comply to power plant operators, the SO_2 program created a regulatory environment in which the government in effect delivered the environmental and economic results promised by, in effect, "getting out of the way" of the market. To be sure, the program did not "get out of the way" of power plant emissions. On the contrary, the mandate to cut emissions is backed by the stiffest and closest-to-automatic penalties in almost all of public law. The program "got out of the way", however, of the underlying fuel and electricity market as it responded to the electricity industry's very real emissions reduction mandates.

In practice, this has meant that power plant operators could capitalize on long-term economic trends in the fuel market in order to maximize cost-savings. Analysts in both the government and academia have observed, for example, that beginning in the 1980's modernizing changes in mining operations and inter-regional rail transport have made coal from the Powder River Basin an increasingly economical option for power plants throughout parts of the Midwest and East. Earlier proposals to curb acid rain would have imposed operational requirements that likely would have stymied these coal market trends. The flexibility inherent in establishing only an actual emissions target as sources' sole legal requirement meant that these trends have continued to develop as the fuel and electricity markets, not as legislators or regulators, have dictated.

VI. The Right Tool for the Job

Congress chose to focus the design of the SO_2 program on total *cumulative* emissions reductions and on *unrestricted* emissions trading and banking because of the atmospheric characteristics of SO_2 emissions. In the atmosphere SO_2 reacts with other pollutants, including the various elements of "smog," to form acidic particles and droplets. These are what constitute acid deposition. Various components of this "soup" of pollutants have been traced traveling over long distances, after being mixed from widely dispersed groups of sources.

In the United States, one common wind pattern moves air from the midwestern region to the northeastern region of the country. These winds mix and carry SO_2 and sulfate (a chemical derived from SO_2), as well as other pollutants involved in the formation of acid deposition. Congress believed that existing scientific understanding supported the conclusion that general wind patterns prevailing over the eastern half of the United States capture the large amount of SO_2 emissions in the Midwest and South. Once the emissions are captured, they are dispersed widely over those parts of the country as well as over the Mid-Atlantic and the Northeast, where acid rain has had a severe local effect.

In view of this, Congress focused on reducing and capping the overall level of SO_2 emissions instead of trying to control local, source-by-source variables. Since it is the total accumulation of acid deposition that principally determines its effect on the environment, the reduction in total emissions of acid precursors (rather than reductions from any one source) appeared to be most critical. Consequently, Congress concluded that it was acceptable to allow emissions trading to occur *without restrictions.* As long as overall reductions were achieved, the emissions levels of individual sources could be permitted to adjust to market forces through trading.

The program's provisions that permit sources to bank allowances for future use also stemmed from the commitment of Congress to both the environmental and the economic performance of the program. Through banking, sources would enjoy much greater flexibility in operating under their SO_2 emissions constraints. In fact, banking could play a critical role in the formation of the overall SO_2 emissions trading market. Equally important, the opportunity to bank extra allowances could yield more and earlier reductions than Congress otherwise could mandate.

At the time the program was proposed, a formal analysis of alternative policy designs was undertaken by Environmental Defense. The study strongly suggested that the very large quantity of SO_2 emissions in the Midwest and parts of the South would allow those regions and their sources to tap economies of scale in making SO_2 reductions. Because of their large inventory of emissions, power plants in those parts of the country would exploit opportunities to make substantial reductions relatively easily and inexpensively. The resulting lower marginal cost of an incremental ton of reduction would make it economically attractive for those sources to "over-control" their emissions—so that they could either sell their extra reductions to other sources or bank those reductions for use in offsetting future emissions. Consequently, the likely economic dynamics of an emissions trading and banking market favored making both mandatory and extra reductions at the high-emitting sources.

The banking component of this dynamic was particularly important. Even for those sources that were uncertain about the short-term economic value of creating extra reductions for the purpose of selling the unused allowances, the prospect of banking those extra reductions was likely to be appealing. While the market demand for extra reductions might not materialize in the short-term, sources knew that they would have to operate against a permanent cap on their emissions. The certainty of the cap and the expectation of economic growth over time would mean that the opportunity to bank extra reductions for future use all but guaranteed that those extra reductions would be economically valuable. Furthermore, with Congress taking a phased approach to control, both the banking provisions and the provisions that allowed Phase II sources to "substitute in" offered the opportunity to design system-wide control optimization.

At the same time, the common understanding of the adverse ecological effects of acid deposition strongly suggested both that reducing cumulative SO_2 emissions should be the goal of the program, and that early reductions were of significant environmental value. The earlier the reductions, the sooner the ecosystems affected by acid deposition could begin to recover their acid-neutralizing capacity. As a result, the economic dynamic created by an emissions cap with banking favored the environmental benefit of early, extra emissions reductions. Indeed, the cap and trade program for SO_2 emissions has provided immediate and significant reductions in those emissions beyond the legal mandate.

Finally, Congress' latitude in permitting unlimited emissions banking and trading, albeit in the implementation of a large mandatory cap and reduction require-

ment, was augmented by other existing provisions of the Clean Air Act. Beginning with its enactment in 1970, the Act has required the EPA and the states to regulate the release of SO_2 from sources whose emissions had local effects on public health. In fact, in the legislation establishing the SO_2 cap and trade program, Congress explicitly barred sources subject to SO_2 emissions limits under the local health-effects program from using SO_2 emissions allowances to meet their local limitations. As a result, plants subject to SO_2 emissions limits imposed for purposes of protecting local air quality cannot exceed these limits no matter how many SO_2 allowances they hold.[2]

VII. The Right Tool for Other Jobs?

Although history lessons may be interesting, the most pressing questions often involve looking forward. As Congress looks ahead to the imperatives created by the new health-based standards for groundlevel ozone smog and fine particles, by the persistence of acid rain in many areas of the country, by the continued problem of haze in pristine areas and national parks and by the mounting evidence of unwanted human-induced climate change, it will need to decide whether and how to use the cap and trade tool. The President's Clean Skies Initiative and multi-pollutant power plant legislation long pending in the Senate ensure that cap and trade will be at the center of any legislative consideration of new air pollution reduction mandates.

In the view of Environmental Defense, cap and trade is a powerful and versatile tool. Congress should make every effort to design new legislation to reduce SO_2, oxides of nitrogen (NO_X) and carbon dioxide (CO_2) emissions from power plants using the cap and trade model. The President and both his predecessors were right to feature cap and trade in their respective environmental policy initiatives.

At the same time, however powerful cap and trade may be, it can only be used constructively if it is embedded in carefully and precisely designed clean air programs and strategies. This issue has already become quite acute in the current debate, as many, including senior administration officials, have suggested that a national cap and trade program for power plant emissions can replace existing authorities under Title I of the Clean Air Act.

If Congress pursues the Clean Skies Initiative or any multi-pollutant power plant cap and trade program it will need to confront this issue seriously. I would like to suggest a construct for thinking about this question.

First, as already noted in this testimony, the acid rain program was established as a complete complement to, not as a replacement for, existing Clean Air Act and state air pollution authorities. This complete separation of the SO_2 program from Title I is illustrative. As a precursor of acid rain, SO_2 emissions are a threat to the extent that they are projected into the atmosphere in great quantities and transported over long distances by prevailing winds. As vehicles for exposing human lungs to particulate matter, SO_2 emissions are largely of concern because of their impact within the confines of local airsheds. Hence Congress' decision in 1990 to address SO_2 emissions simultaneously in two separate programs. Again, the Clean Air Act makes clear that Title I authorities take precedence over the SO_2 acid rain program.

In the context of multi-pollutant power plant legislation, SO_2 and NO_X emissions again would be regulated as precursors of acid rain. They also would be regulated as precursors of groundlevel ozone and fine particles. It is in this respect that these pollutants should be subject *both* to new cap and trade requirements and to existing Title I authorities. This is because even in the context of the attainment of the national ambient air quality standards for ozone and fine particles, power plant SO_2 and NO_X contribute to nonattainment *both* as pollutants transported in quantity from an aggregation of remote sources *and* as pollutants injected into local airsheds by local or nearby upwind sources, including power plants in both instances.

A cap and trade program can *guarantee aggregate* reductions in power plant SO_2 and NO_X emissions *but the reductions are guaranteed only for that portion of the local emissions inventory comprising the contributions of long-distance transport.* Consequently, reductions in SO_2 and NO_X in the local airshed will occur only in proportion to the amount of airshed SO_2 and NO_X attributable to reductions in long-range transport. To the extent that airshed SO_2 and NO_X continue to be generated

[2] The legislation establishing the SO_2 program explicitly preserved the existing Clean Air Act authorities of Congress and the EPA to impose additional restrictions on SO_2. In addition to calls for Congress to require further reductions in annual SO_2 emissions beyond those mandated for Phase II, the EPA has issued new standards for fine particle emissions (these regulations are currently in litigation). Depending on how the implementation programs for these standards are designed, power plants may face either one of, or a combination of, additional reductions in the SO_2 emissions cap and/or additional source-specific reduction requirements.

by local power plants or nearby upwind power plants additional reductions at those sources may be needed to attain the NAAQS. By itself a cap and trade program cannot ensure that all cost-effective and/or necessary reductions from local, or critical nearby upwind, sources will be achieved. Only programs and authorities currently constituted under Title I can ensure those.

Thus, in some nonattainment areas, residual local emissions from power plants may prove to be critical contributors to nonattainment. In that case, the retention of Title I applicability to those emissions will prove to be vital to attaining the NAAQS. If, however, those authorities are removed or effectively disabled as the political price exacted for multi-pollutant cap and trade legislation, then the entire exercise will have proven to be self-defeating for the people living in those areas forced to face continued exposure to unhealthful air.

VII. Something Missing: Carbon Dioxide (CO_2)

In his February 14 speech presenting his Clean Skies Initiative and climate strategy, President Bush said:

> "If, however, by 2012 our progress is not sufficient and sound science justifies further action, the United States will respond with additional measures that may include broad-based market programs as well as additional incentives and voluntary measures designed to accelerate technology development and deployment."

Although the President's intent was just the opposite, this statement would seem to reinforce the logic underlying the adoption of multi-pollutant power plant legislation that included CO_2, as well as the three conventional pollutants. The President seems to have set up a high-stakes wager.

In the coming decade and a half the power sector will be facing either legislated reductions of SO_2, NO_X and mercury emissions *or* reduction requirements driven under current law by the MACT standard for mercury and by the demands of attaining the NAAQS for ozone and fine particles. This means that virtually every electricity sector company will be making substantial long-term capital investments involving fuel and technology choices. The logic of a multi-pollutant approach, legislated by Congress and implemented by a cap and trade system, is that companies will be able to bring a higher degree of economic efficiency, environmental efficacy and overall rationality to those investment and operation decisions if they are acting, with certainty, under a comprehensive emissions regime.

This logic applies in its fullest sense only if that regime encompasses all four—not just three—of the pollutants or classes of emissions likely to be subject to new reduction requirements at some point during the current investment horizon. To ask companies to make investments with certain knowledge of what their liabilities are for SO_2, NO_X and mercury and with only speculation as to their potential CO_2 obligations, is to make each company place a bet on what the future of climate-related emissions control regulation will be. If they bet wrong, and after having made substantial SO_2, NO_X and mercury compliance investments, are called on again to make separate investments in limiting their CO_2 emissions, their overall costs are likely to be much higher than if multi-pollutant legislation is truly comprehensive and covers CO_2.

The President's own explicit reference to potential climate policy changes in the next ten years is a tip off as to how acute this uncertainty is. After all, even discounting for the most compelling arguments that critics offer against both the Kyoto Protocol and the *bona fides* of those nations moving to ratify it, a great many members of the international community—including the world's leading scientists, national policy-makers and the executives of some of the largest multinational energy and chemical companies—have already concluded that the *current* state of the science justifies limiting greenhouse gas emissions now. In this light, the potentially high-cost bet that power companies will be forced to make either under current law or under three-pollutant cap and trade legislation—that they will not be facing CO_2 emissions obligations in the next 15-to-20 years—seems almost rigged against them. In contrast, incorporating a CO_2 emissions limitation requirement implemented through a fully flexible cap-and-trade model that allowed offsets from other sectors, including agriculture and land use, offers electric companies a far more cost effective path forward—instead of a dangerous, rigged wager. Little wonder, then, that at least one major coal-burning utility acting by itself and a separate coalition of utilities have come forward to support four- rather than three-pollutant legislation.

Mr. BARTON. Thank you, Mr. Goffman.

We now want to hear from Dr. James Lents, the Environmental Policy, Atmospheric Processes and Modeling Laboratory at the University of California at Riverside.

Your statement is in the record in its entirety. We would ask that you summarize in 5 minutes. Welcome to the subcommittee.

STATEMENT OF JAMES LENTS

Mr. LENTS. Yes, sir. As stated, my name is James Lents, and I am Director of the programs you alluded to at the University of California, Riverside. But prior to my present position, I served 8 years as Technical Director for the Chattanooga-Hamilton County Air Pollution Control Program, 7 years as Director of the Colorado Air Pollution Control Program, and 11 years as Executive Officer for the South Coast Air Quality Management District in California.

Mr. BARTON. You don't look that old. You started at two? You were a child prodigy.

Mr. LENTS. In each of these assignments, the Clean Air Act played an important and critical role in supporting and even engendering the air quality improvement that has occurred in each location. News releases by the Mayor of Chattanooga, the Governor of Colorado and the leaders in Southern California illustrate the pride that each area has taken in the significant air quality improvements that have been achieved.

In 1970, Chattanooga suffered some of the dirtiest air in the Nation. This included particulate levels in the downtown region that were among the highest in the Nation, NO2 levels that serves as a laboratory for the early development of NO2 health standards, and violations of the carbon monoxide and ozone standards.

Although Chattanooga had operated a smoke abatement program since the 1930's, the rules had little effect. Air quality was so poor that auto dealers and homeowners washed their cars daily to avoid permanent paint damage, and high ambient NO2 levels even damaged women's nylon hose while they were being worn.

A local health study demonstrated that children living in areas that were at the lower end of the Chattanooga air pollution spectrum had significantly above normal respiratory problems. The effects on the minority communities that existed in the worst part of the pollution were never documented.

In association with the 1990 Clean Air Act amendments, Federal funding was withdrawn from Chattanooga, and a Federal implementation plan was threatened to inspire serious actions by local and State officials. These steps, along with the establishment of nationally accepted health standards called for in the 1970 amendments, inspired the local city and county governments to revamp their air pollution control effort.

The Federal Government then provided funding that allowed the city and county to hire a small staff of air pollution control experts to oversee the cleanup effort. The region implemented tough emission standards in the early 1970's, with controls completed between 1973 and 1979. Particulate levels dropped noticeably in the 1970's and early 1980's, and Chattanooga came into compliance with existing standards in the mid-1980's.

Following this achievement, Chattanooga transformed its formerly grimy downtown area into a beautiful mall and riverfront park. Chattanooga's economy has continued to grow, becoming a poster child for what could be done to control air pollution. The

1970 Clean Air Act was the seminal event that stimulated these important changes.

I supplied a figure to show the change in particulate level in Chattanooga between 1970 and 1990.

Denver, Colorado, experienced the worst carbon monoxide levels in the United States in the 1970's, close to four times the national health standard, with levels getting worse year by year along with a burgeoning "brown cloud" problem and a concern about ozone.

The 1970 and 1977 Clean Air Act amendments required Colorado to produce a compliance plan by 1982 to demonstrate how the carbon monoxide problem would be solved. The 1977 Clean Air Act amendments also mandated a vehicle inspection and maintenance program for the Denver area. More importantly, however, the Federal law set a strict deadline to attain healthy air, and included sanctions for not making a good faith effort to meet cleanup requirements.

After a brief application of Federal sanctions to get legislative action, Colorado adopted an I&M program in 1980, and with the aid of automobile emission standards set forth by the Clean Air Act, began its development of an attainment plan. Local planning processes resulted in a conclusion that I&M and the Federal automobile emission standards were inadequate to meet ambient air quality levels by the 1987 deadline.

This conclusion resulted in the development of a pilot episodic no-drive program and research into cleaner burning fuels. While the no-drive program did not produce the desired results, the cleaner burning gasoline did. The tightening automobile emission standards, combined with the I&M program and cleaner burning gasoline produced significant carbon monoxide reductions before 1990 and attainment of the carbon monoxide standard in the early 1990's. Again, I supplied a chart, Figure 2, showing the results.

Los Angeles, which suffered severe photochemical smog by the 1950's, is the birthplace of the understanding of the source and cause of much of our urban air pollution. It initiated the control of automobile emissions in the 1950's, ahead of anyone else in the United States. However, by the 1970's, the air pollution problem in Los Angeles had become generally worse, in spite of these local county air pollution control efforts.

The advent of the 1970's and 1977 Clean Air Act amendments accelerated the development of a region-wide air pollution control agency called the South Coast air Quality Management District, and the far reaching automobile standards in the 1970's Clean Air Act amendments set California on an aggressive path toward cleaner air.

Inspired by the results of the Clean Air Act's automobile emission standards, California, as the only State allowed to set separate mobile source standards, took over the lead from U.S. EPA in driving vehicle emission standards in the 1980's and 1990's.

The citizen suit provisions in the Clean Air Act amendments played an important role in fostering clean air in Los Angeles. After the failure of the South Coast Air Quality Management District to develop a suitable State implementation plan by 1982, environmental groups used the citizen suit sections of the Clean Air

Act to get a judicial ruling requiring the U.S. EPA to develop a Federal implementation plan for the region.

This embarrassment to the local leadership, along with subsequent State and Congressional hearings, resulted in a much more activated South Coast air pollution control program, advancing progress toward clean air and producing important experience needed for the 1990 Clean Air Act amendments.

Mr. BARTON. Could you summarize, Dr. Lents, please?

Mr. LENTS. Sure. I'll jump over.

There is still a long way to go to achieve the goal of healthy air in the United States. Chattanooga and much of the eastern United States are likely in violation of the new $PM_{2.5}$ and ozone standards. Acid deposition is another significant problem that needs continued focus, especially in the east.

Los Angeles, along with many other areas in California and Texas, still suffers from ozone air pollution, and will violate the new $PM_{2.5}$ standards. Western visibility is significantly reduced.

A unifying theme surrounding these 21st Century issues is the need to address the multi-jurisdictional, regional aspects of smog. When the Clean Air Act was envisioned in 1963, 1970 and 1977, and to some degree in 1990, air pollution was seen as primarily a local and State problem that simply needed a boost from the Federal Government to reach attainment goals.

It is clear today that air pollution problems cross State lines and international boundaries and, in some cases, are global in nature. Future air quality improvement programs must address these complex inter-jurisdictional issues.

I will conclude my testimony here, and I will be pleased to answer questions.

Mr. BARTON. Thank you, Doctor. It is obvious you have probably testified before the Senate where they don't have a time limit, because you know so much, you just get carried—not carried away, but it is hard to squeeze as much as you know into 5 minutes.

[The prepared statement of James Lents follows:]

PREPARED STATEMENT OF JAMES M. LENTS, DIRECTOR, ENVIRONMENTAL POLICY AND ATMOSPHERIC RESEARCH LABORATORY, CENTER FOR ENVIRONMENTAL RESEARCH AND TECHNOLOGY, UNIVERSITY OF CALIFORNIA AT RIVERSIDE

Good morning. My name is James M. Lents. I am Director of the Environmental Policy and Atmospheric Research Laboratory for the Center for Environmental Research and Technology at the University of California, Riverside, Bourns College of Engineering. Prior to my present position, I served 8 years, from 1971 to 1979, as Technical Director for the Chattanooga-Hamilton County Air Pollution Control Program, 7 years, from 1979 to 1986, as Director of the Colorado Air Pollution Control Program, and 11 years, from 1986 to 1997, as Executive Officer for the South Coast Air Quality Management District in California.

My environmental career began at the adoption of the 1970 Clean Air Act Amendments working in the Chattanooga, Tennessee, air pollution control program. I continued to work in air pollution control programs following the 1977 and 1990 Clean Air Act Amendments in Colorado and California respectively. In each of these assignments, the Clean Air Act played an important and critical role in supporting and even engendering the air quality improvement that has occurred in each location. News releases by the Mayor of Chattanooga in the early 1980s and by the Governor of Colorado and the leaders in Southern California more recently illustrate the pride that each of these areas has taken in the significant air quality improvements that have been achieved.

In 1970, Chattanooga suffered some of the dirtiest air in the nation. This included particulate levels in the downtown region that were among the highest in the nation, NO_2 levels that served as the laboratory for the early development of NO_2

health standards, and violations of the Carbon Monoxide and Ozone standards. Although Chattanooga had operated a smoke abatement program since the 1930s, the rules had little effect. Air quality was so poor that auto dealers and homeowners washed their cars daily to avoid permanent paint damage, and high ambient NO_2 levels even damaged women's nylon hose while they were being worn. A local health study demonstrated that children living in areas that were at the lower end of the Chattanooga air pollution spectrum had significantly above normal respiratory problems. The effects on the minority communities that existed in the worst part of the pollution were never documented.

In association with the 1970 Clean Air Act Amendments, Federal funding was withdrawn from Chattanooga and a Federal Implementation Plan was threatened to inspire serious actions by local and state officials. These steps, along with the establishment of nationally accepted health standards called for in the 1970 Amendments, inspired the local city and county governments to revamp their air pollution control effort. The Federal government then provided funding that allowed the city and county to hire a small staff of air pollution control experts to oversee the cleanup effort. In the face of medical testimony from local company doctors that air pollution in Chattanooga was not a problem and threats by local manufacturers to close their plants if air pollution rules were adopted, the region implemented tough emission standards in the early 1970s. Controls on sources were completed between 1973 and 1979. Particulate levels dropped noticeably in the 1970s and early 1980s, and Chattanooga came into compliance with existing standards in the mid-1980s. Following this achievement, Chattanooga transformed its formerly grimy downtown area—where you once could not see across the street—into a beautiful mall and riverfront park. Chattanooga's economy has continued to grow, becoming a poster child for what could be done to control air pollution. A national article in Time magazine and an EPA film titled "What One City Did" documented the efforts by Chattanooga to resolve its air quality problems. Today, Chattanooga takes great pride in its much cleaner air. The 1970 Clear Air Act was the seminal event that stimulated these important changes. Figure 1 shows the change in particulate levels in Chattanooga between 1970 and 1990.

Denver, Colorado, experienced the worst Carbon Monoxide levels in the United States in the 1970s, close to 4 times the national health standard, with levels getting worse year by year along with a burgeoning "Brown Cloud" problem and concern about Ozone. The 1970 and 1977 Clean Air Act Amendments required Colorado to produce a compliance plan, referred to as a State Implementation Plan in the Clean Air Act, by 1982 to demonstrate how the Carbon Monoxide problem would be solved. The 1977 Clean Air Act Amendments also mandated a vehicle inspection and maintenance (I/M) program for the Denver area. More importantly, however, the Federal law set a strict deadline to attain healthy air and included sanctions for not making a good faith effort to meet cleanup requirements. After a brief application of Federal sanctions to get legislative action, Colorado adopted an I/M program in 1980, and with the aid of automobile emission standards set forth by the Clean Air Act began its development of an attainment plan. The local planning process resulted in the conclusion that I/M and the Federal automobile emission standards were inadequate to meet ambient-air quality levels by the 1987 deadline. This conclusion resulted in the development of a pilot episodic no-drive program and research into cleaner-burning fuels. While the no-drive program did not produce the desired results, the cleaner-burning gasoline did. The tightening automobile emission standards as specified in the Clean Air Act combined with the I/M program and cleaner-burning gasoline produced significant Carbon Monoxide reductions before 1990 and attainment of the Carbon Monoxide standard in the early 1990s. A synopsis of the change in Carbon Monoxide levels between 1970 and 2000 is shown in Figure 2.

Los Angeles, which suffered severe photochemical smog by the 1950s, is the birthplace of the understanding of the source and causes of much of our urban air pollution. It initiated the control of automobile emissions in the 1950s, ahead of anyone else in the United States. However, by the 1970s, the air pollution problem in Los Angeles had become generally worse in spite of these local county air pollution control efforts. The advent of the 1970 and 1977 Clean Air Act Amendments accelerated the development of a region-wide air pollution control agency called the South Coast Air Quality Management District, and the far-reaching automobile standards in the 1970 Clean Air Act Amendments set California on an aggressive path toward cleaner air. Inspired by the results of the Clean Air Act's automobile emission standards, California, as the only state allowed to set separate mobile source standards, took over the lead from the U.S. EPA in driving vehicle emission standards through the 1980s and 1990s.

The citizen suit provisions in the Clean Air Act Amendments played an important role in fostering clean air in Los Angeles. After the failure of the South Coast Air Quality Management District to develop a suitable State Implementation Plan by 1982, environmental groups used the citizen suit sections of the Clean Air Act to get a judicial ruling requiring the U.S. EPA to develop a Federal Implementation Plan for the region. This embarrassment to the local leadership along with subsequent State and Congressional hearings resulted in a much more activated South Coast air pollution control program, advancing progress toward clean air and producing important experience needed for the 1990 Clean Air Act Amendments.

Once adopted, the 1990 Clean Air Act Amendments gave Los Angeles a reasonable time frame to solve its problems. With this more realistic deadline, the South Coast Air Quality Management District in association with the California Air Resources Board and Southern California Association of Governments produced the first State Implementation Plan to ever be approved by the U.S. EPA for Southern California. Implementation of this Plan has produced remarkable results. In spite of some of the largest population and economic growth in the nation, California has reduced the number of violation days of air quality standards by 80% since the 1970s and has had no air pollution alerts since 1999 for the first time in the history of air monitoring there. Figure 3 illustrates the changes in Ozone levels in Southern California since the 1977 Clean Air Act Amendments.

As I close my testimony, I want to note three important issues. First, there was clearly a need for the Federal government to intervene at times and to push states to develop adequate clean air programs; however, the Clean Air Act would not have succeed as it has without a close partnership between state and local air pollution control efforts and the Federal government. Second, there has been difficulty in achieving the flexibility for state programs and businesses that were envisioned in the discussions surrounding the Clean Air Act Amendments. This needs to be improved in the future. Third, the air pollution problem is far from solved and will require even more complex actions as we proceed into the 21st Century.

State and local programs established and now maintain almost all of the nation's air monitoring stations, wrote and continue to adopt most of the applicable stationary source regulations, and operate and enforce most of the local compliance programs. No success would have been achieved if these programs had not been effective. The California automobile control program has provided much of the leadership for the clean vehicles that are being produced today. The Colorado air pollution control program combined with subsequent efforts in California pointed the way toward the development of today's cleaner burning gasoline and diesel fuel.

The processes employed by the U.S. EPA to enforce Federal requirements in the Clean Air Act have not always enabled the level of flexibility that could have been included in the process. Examples can be cited concerning experiences with I/M programs, the specific design of State Implementation Plans, and most notably the recent application of the Title V Federal permitting program. Greater effort needs to be made in future Clean Air Act implementation to find more flexible ways of applying its requirements. Although not a panacea, an important potential for the future can be a further move away from command and control regulation toward more flexible market-based solutions. It appears that Federal regulatory programs along with many state and local programs are now recognizing the benefits of market-based solutions in many key regulatory programs.

There is still a long way to go to achieve the goal of healthy air in the United States. Chattanooga and much of the Eastern United States are likely in violation of the new $PM_{2.5}$ and Ozone standards. Acid deposition is another significant problem that needs continued focus, especially in the East. Los Angeles along with many other areas in California and Texas still suffers from Ozone air pollution and will violate the new $PM_{2.5}$ standards. Western visibility is significantly reduced in many locations, leaving Denver and many other areas without the beautiful vistas that they once enjoyed. A unifying theme surrounding these 21st Century issues is the need to address the multi-jurisdictional, regional aspects of smog. When the Clean Air Act was envisioned in 1963, 1970, and 1977, air pollution was seen as primarily a local or state problem that simply needed a boost from the Federal government to reach attainment goals. It is clear today that air pollution problems cross state lines and international boundaries and in some case are global in nature. Future air quality improvement programs must address these complex inter-jurisdictional issues.

Finally, the population of the earth will pass 10 billion during this century. Available land for humans and ecosystems to operate has dropped from about 17 acres per person in the 1950s to 8 acres per person today. This decline will continue in this century to levels possibly below 5 acres per person. This increasing human density along with continued economic growth will further exacerbate air quality and

other environmental problems. It is imperative that Congress continues to provide both national and international leadership towards cleaner air.

This concludes my testimony. I will be pleased to answer questions at the appropriate time.

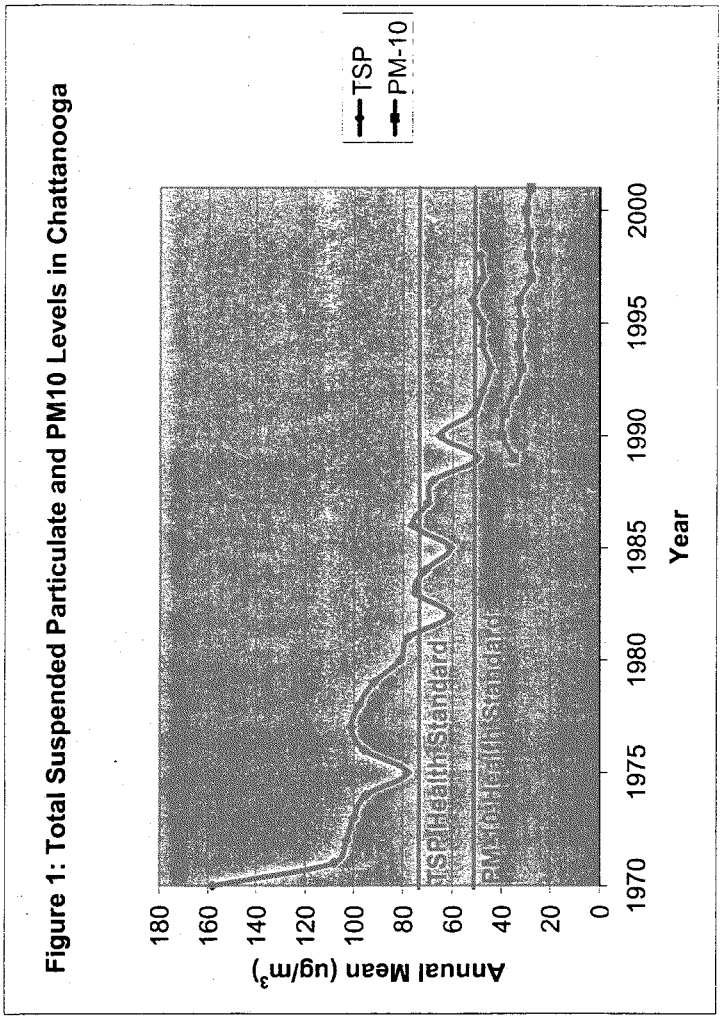


Figure 2: Carbon Monoxide Levels in Denver

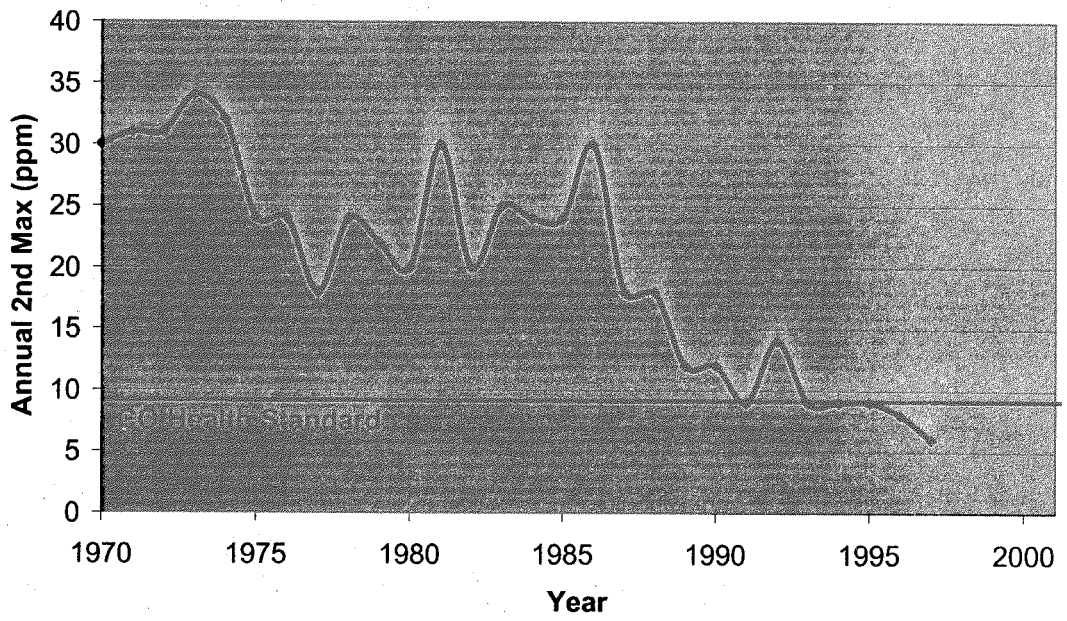
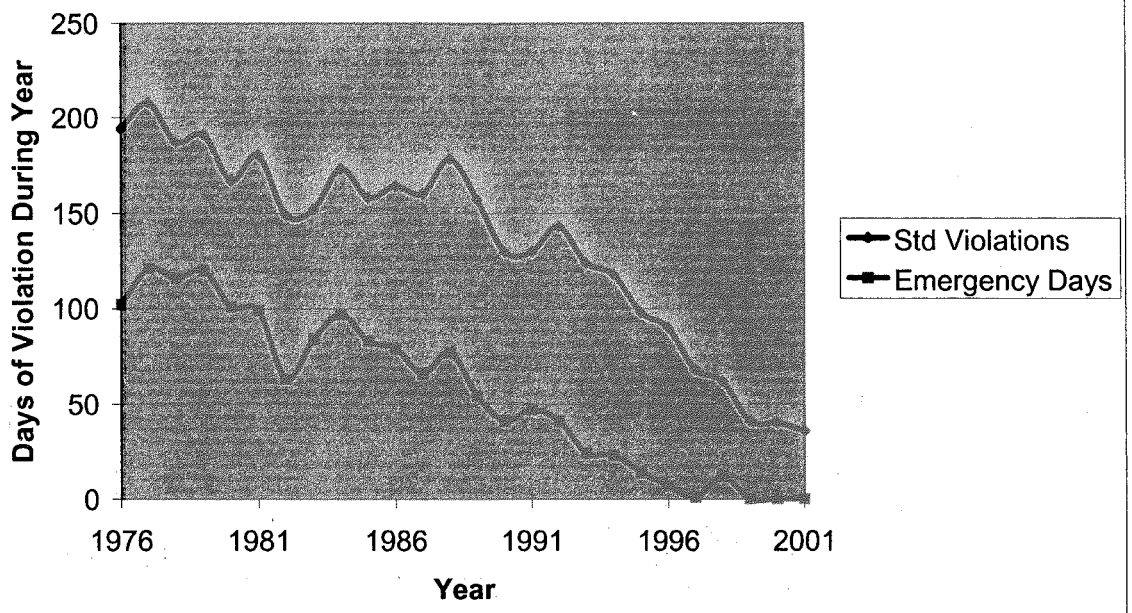


Figure 3: Days of Violation of the Ozone Standard in Los Angeles



Mr. BARTON. We are now going to hear from another expert, Mr. Alan Krupnick, who is a Senior Fellow and Director, Quality for the Environment Division of the Resources for the Future, and we welcome you, sir. Your testimony is in the record, and ask that you attempt to summarize it in 5 minutes.

STATEMENT OF ALAN KRUPNICK

Mr. KRUPNICK. Sure. Well, I want to thank you for inviting me here again. It has been about five or 7 years or something since I was back, and this is my favorite topic and favorite committee. So, thank you.

Mr. BARTON. We like you, too.

Mr. KRUPNICK. I want to applaud you for starting hearings again to look at reopening the Clean Air Act, and I think the reasons are because the goal posts have now been—with criteria pollutants have now been moved back. with the new ozone standard, the new fine particulate standard, many new areas of the country are going to be in violation of these standards, and without certain initiatives that are being discussed, we are going to face as a country a tough job in meeting these standards. So it is appropriate that we reopen, look again at our thinking, and care much more than we have in the past perhaps about cost effectiveness.

In addition, and perhaps ironically to some, because of the success of the cap and trade program, we really need to look at the appropriateness of New Source Review, and I'll get to that in a minute.

So what I did first is look at the performance of the Act according to two metrics. One has to do with those lines, the graph that Jeff Holmstead put up. I have more lines on my graph, if anyone wants to look at it, but the message is, of course, the same, that economic activity is going up, and emissions are going generally down. But that doesn't say too much about the costs of control and the cost effectiveness of the controls.

So one way to look at that is by looking at the studies that you all mandated EPA to do, the retrospective and prospective cost-benefit analyses of the Clean Air Act and its amendments. I have done—You probably all looked at them. I have relooked at them recently.

Of course, they show that the benefits of this Act far outweigh the costs, pretty much no matter how you slide it up, as a general rule. Having said that, it is important to note that most of those benefits come from reductions in SO_2 that are related to mortality reductions, at least the benefits that were quantified in these studies, and perhaps the benefits from some of the other pollutants have not been that large.

It is also important to know that the studies didn't disaggregate the benefits by pollutant and by sector or even by subsection of the Act. So when we look to those studies as a guide for how to change things in the future, we come up pretty short.

Mr. BARTON. Keep going.

Mr. KRUPNICK. Okay. So I have looked at some other studies in the literature and our own work as well as just economic analyses to try to shed some more light on what worked and what hasn't worked. Of course, as we have all said, the SO_2 trading program

is the bright, shining star of the Clean Air Act, as far as I am concerned as an economist, and it has really led the way to a change in the thinking about policy instruments at EPA and indeed even around the world.

In addition to that, we haven't talked much today about mobile sources, and I think that the fuel, particularly the early fuel reformulations, Federal measures for them, and Federal tailpipe standards did a cost effective job in reducing these emissions. But recently things have gotten a bit tattered.

The MTBE problem as an additive causing water pollution, the ethanol as a substance being heavily subsidized and being put into reformulated gas, and the problem of designer fuels in gas spikes need to, I think, command the committee's attention.

Now less effective segments of the Act and its amendments are a couple. One is the SIP process. This is really not that well suited to address issues of long range pollution transport.

In a committee I was on with James Seitz to look at the future of Clean Air Act implementation, we talked about areas of influence and areas of violation as a different paradigm than the SIP process to think about controlling pollution, and I encourage the committee to look at that.

Inspection and maintenance programs are not working very well. That needs to be looked at. They don't target very well the dirtiest vehicles, and the dirtiest vehicles don't get cleaned up well. That needs to be looked at.

Then finally the New Source Review. As I started before, I want to try to make this as clear as I can that the existence of a cap on SO_2 means that, if new sources have to do more with New Source Review than if there was no New Source Review, all that means is that the price of allowances is going to go down, and the costs of control are going to go way up. But the SO_2 permits themselves, the SO_2 emissions themselves, are going to stay constant, because of the cap.

So there is no benefit to the environment, no clear benefit to the environment from this cap and from the New Source Review. So I would suggest that the administration's Blue Skies initiative where we are reducing SO_2 caps and perhaps eliminating New Source Review makes economic sense, and it makes environmental sense. Thank you.

[The prepared statement of Alan Krupnick follows:]

PREPARED STATEMENT OF ALAN KRUPNICK, SENIOR FELLOW AND DIRECTOR, RESOURCES FOR THE FUTURE

Thank you Chairman Barton and other members of the subcommittee for the opportunity to testify on the performance of the Clean Air Act. I am Alan J. Krupnick, senior fellow and director, at Resources for the Future (RFF), a nonprofit, nonadvocacy research and educational organization specializing in problems of natural resources and the environment since 1952. The views I express today are my own, not those of RFF.

The performance of the Clean Air Act (CAA) can be measured in two general ways:

(1) by how much better off the American people are with the act than without it, in other words, by the excess of the benefits of the act compared to the costs; and

(2) by whether these benefits and costs are distributed throughout the population in a way that we as a society find acceptable or advantageous.

The former may be termed an efficiency measure; the latter is an equity measure. I will offer some thoughts on the former only.

Economic Versus Environmental Performance Measures

There are several ways in which efficiency can be measured. One revealing, but nonrigorous approach is simply to compare how well the economy has performed since the Clean Air Act was implemented to the performance of various indicators of emissions and air quality. If economic activities are going up while pollution is going down, this is an indicator that something in the act is going well. It is an incomplete indicator, to be sure. For example, as the economy grows, the composition of its output changes. If by accident this change results in lower emissions, such changes should not be counted as a benefit of the act.

The attached chart presents some of these comparisons. Measures of general economic activity include gross domestic product, megawatt hours of electricity generated, fuel used, and vehicle miles traveled.

These activities are compared to the U.S. Environmental Protection Agency's (EPA) emissions and air quality trends data for each of the criteria pollutants, except lead. Lead is an obvious, major success story for the Clean Air Act as it is a highly toxic pollutant that was largely removed from environmental concern through EPA's phase-out of lead from gasoline, using authority conferred to the agency by the act. Even the policy used to implement the phase-out was well conceived from a cost-effectiveness perspective, as the lead phase-down rule was an early version of tradable permit programs, which have turned out to be so successful.

From Figure 1, with each trend line indexed to 1970, it is clear that measures of general economic activity, as well as activities more or less directly leading to emissions, are trending strongly upward while emissions are either flat (NO_X emissions) or falling. The flat or downward trend in emissions is also mirrored in the air quality data (not shown) where the number of nonattainment areas has been falling, although not steadily.

Cost-Benefit Analyses of Performance [1]

A more rigorous approach to measuring the efficiency of the act is to simply refer to the results of the Section 812 studies that Congress required in the 1990 Clean Air Act Amendments (CAAA) EPA to do: *The Benefits and Costs of the Clean Air Act: 1970 to 1990* (EPA, 1997a) and *The Benefits and Costs of the Clean Air Act, 1990 to 2010* (EPA, 1999). Because the first of these studies began after 1990, it is called the retrospective study, while the latter, tracking the effects of the 1990 Amendments, is called the prospective study.

These studies are probably the most intensive and expensive cost-benefit analyses ever done at the agency. Under the auspices of the agency's Science Advisory Board, both studies were scrutinized throughout the decade-long preparation by at least three expert committees of outside economists, air quality modelers, epidemiologists, and other health experts.

Although both the retrospective and the prospective studies involve many controversial policy and technical issues, they clearly show that, *taken as whole,* the nation has received high returns on its investment in improved air quality over the past three decades. The estimates indicate that, for the early years, benefits exceed costs by a factor of 40 or more. Prospectively to the 1990 Amendments, benefits still exceeded costs, although by a far smaller margin.

Table 1 presents the annualized (central) estimates for both benefits and costs developed in the two studies. Each of the two (aggregate) scenarios is evaluated by a sequence of economic, emissions, air quality, physical effect, economic valuation, and uncertainty models to measure the differences between the scenarios in economic, human health and environmental outcomes. Both studies examine the benefits and costs of reducing volatile organic compounds (VOCs), nitrogen oxides (NO_X), sulfur dioxide ($S0_2$), carbon monoxide (CO), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$).[2]

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[1] Much of the discussion in this section is taken from Krupnick and Morgenstern (2002).

[2] Although the incremental effects of the 1990 Amendments on primary particulate matter (PM) emissions is relatively small, PM in the atmosphere is comprised of both directly emitted primary particles and particles that form in the atmosphere through secondary processes as a result of emissions of SO_2, NO_X, and organic compounds. These PM species, formed by the conversion of gaseous pollutants emissions, are referred to collectively as "secondary" PM. Because the Clean Air Act, especially the 1990 Amendments, achieve substantial reductions in these gaseous precursor emissions, it has a much larger effect on PM_{10} and $PM_{2.5}$ than might be apparent if only the changes in directly emitted particles are considered. Also, the retrospective analysis assessed the effect of CAA provisions governing lead in the environment. However, since the

These results indicate that aggregate benefits of air pollution control exceed costs by more than an order of magnitude for the period 1970-1990. Note that this conclusion is robust with respect to alternative assumptions about age-adjusted mortality. Also note that the costs were treated as if the were certain, when, in fact, there is much uncertainty about such costs.

Table 1: Central Estimates of Total Annual Monetized Benefits and Costs of Environmental Regulations

(Billions of 1996 dollars as of 1999)

	Benefits	Costs
EPA retrospective report, 1990	$960 [1] to $1450	$54
EPA prospective report, 2000	$55 [1] to $96	$20

Source: OMB (2000)
[1] Age-adjusted mortality estimate.

While benefits still exceed costs for the prospective study, the ratio of benefits to costs is considerably lower than in the retrospective analysis, suggesting that the "truly low-hanging fruit" may have been picked in the early years.[3]

Table 2, taken directly from the prospective study, summarizes the central estimates on a present value basis by title of the Clean Air Act. For Titles I-V, present value estimates of benefits exceed those of costs by a factor of four. About 90% of these benefits are associated with avoided mortality. The remainder are associated with avoided morbidity and with ecological and welfare benefits. On the cost side, the prospective analysis finds that Title I accounts for almost half of the total cost of the first five titles. Title II accounts for another third, with the balance distributed among Titles III-V. Because of the long-term nature of the benefits of Title VI (stratospheric ozone), the results for this title are not fully integrated into the overall findings. However, the present value benefits of this title exceed costs by a factor of 20.

Overall, as the Agency has written in the prospective study, the conclusion of the 812 analysis is clear:

> "While alternative choices for data, models, modeling assumptions, and valuation paradigms may yield results outside the range projected in our primary analysis, we believe based on the magnitude of the difference between the estimated benefits and costs that it is unlikely that eliminating uncertainties or adopting reasonable alternative assumptions would change the fundamental conclusion of . . . [the] study: the Clean Air Act(s') . . . total benefits to society exceed its costs." (page v)

How much stock should we put in these overall results? The Science Advisory Board's general endorsement is certainly good reason for trusting the results. However, there were some important and acknowledged shortcomings, including the lack of disaggregation of benefits, difficulty in defining a baseline, difficulties in measuring the willingness to pay for mortality risk reductions, omissions of important benefit categories, and poorly estimated costs.

Not Enough Disaggregation. Both studies were conducted at a highly aggregate, economy-wide level. The retrospective study did not estimate either the benefits or the costs of individual regulations, pollutants, or of any subcategories (for example, stationary versus mobile sources) of the federal air pollution program. The prospective study estimated costs but not benefits by title of the 1990 Amendments, but there were no further disaggregations.

From a policy perspective, an analysis of total costs and total benefits represents a very simple approach to a complex issue. Arguably, few propose abandoning all federal air pollution control. The more policy-relevant question concerns the costs and benefits of individual regulations and, even more relevant, the costs and benefits of marginal changes to individual regulations on individual pollutants. The principle rationale offered by the agency for this highly aggregate analysis is that while costs can be reliably attributed to individual regulations or programs, the broad-scale methodology used for the benefits analysis precludes reliable estimation of the benefits by regulation or program, especially since some pollutants, such as NO_X, show up in multiple titles and affect multiple criteria pollutants (NO_2, ozone, and particulates).

1990 Amendments do not include new provisions for the control of lead, it is not considered in the prospective analysis.

[3] In one of the scenarios presented in the prospective study (low benefits) costs actually exceed benefits by $1 billion per year.

Yet, others have analyzed disaggregated pollutants by title, taking EPA's aggregate benefit estimate (and cost estimates by title) as given (Smith and Ross, 1999), and for Title IV alone (Chestnut, 1995, Burtraw et al, 1998), which applied only to the electricity generation sector. In addition, EPA was able to develop separate benefit estimates for their new ozone and fine particulate National Ambient Air Quality Standards (NAAQS) (USEPA, 1997b). The findings from these studies are presented in table 3. This table shows that some titles deliver more net benefits than others and that the new fine particulate NAAQS is likely to be a much better buy for society than the new 8-hour ambient ozone standard.

Difficulty Defining the Baseline. The so-called baseline issue is another knotty problem for judging the reliability of these studies. In both studies the Agency analyzed air pollution programs by comparing specific policy and baseline scenarios. The retrospective study contrasted a scenario reflecting historical economic and environmental conditions observed with the Clean Air Act in place to a hypothetical scenario projecting the economic and environmental conditions which would have existed on the assumption that the stringency and effectiveness of air pollution control technologies were frozen at their 1970 levels. In the prospective study, all rules promulgated or expected to be promulgated pursuant to the 1990 Act were contrasted to a scenario that essentially freezes federal, state, and local air pollution controls at the levels of stringency and effectiveness prevailing in 1990. Both studies hold constant the geographic distributions of populations and economic activities across the scenarios.[4]

The frozen technology assumption—an obvious simplification—is central to the overall results. Arguably, in the absence of new federal regulation, one would expect to see some air pollution abatement activity, due to state or local regulation or, possibly, on a voluntary basis. As Davies (1970) has reported, nonfederal air pollution efforts date back to 1881 when the city of Chicago adopted an ordinance that declared: "the emission of dense smoke from the smokestack of any boat or locomotive or from any chimney anywhere within the city shall be . . . a public nuisance." Davies reports that other cities followed Chicago's example. More recently, some states have imposed particularly stringent controls, especially California. If one assumed that state and local regulations would have been equivalent to federal regulations, then a cost-benefit analysis of the Clean Air Act would be a meaningless exercise: both benefits and costs would equal zero. For both studies, EPA and the outside experts wrestled with the possibility of developing more realistic baseline scenarios. In the end, they decided that any attempt to predict how states' and localities' regulations or voluntary efforts would have differed from the Clean Air Act is too speculative.

Difficulty Measuring Values for Mortality Risk Reductions. The monetized benefits reflect interpretations of the available science and economic literature made by the Agency in consultation with its outside experts. As a form of sensitivity analysis, a number of alternative interpretations of the literature also were examined. The quantitatively most important concern the valuation of premature mortality. In both the retrospective and prospective analyses, the Agency developed an alternative scenario based on the loss-of-life-years approach to reflect the greater susceptibility of older individuals to air pollution-induced mortality. In both studies, this scenario yielded significantly lower benefits. The prospective study also examined alternative assumptions about the incidence of mortality, the incidence and valuation of chronic bronchitis, as well as certain other effects. For Title VI, sensitivity analysis reflected potential averting behaviors, such as remaining indoors or increasing use of sunscreen or hats.

Since these studies were published, two distinct elements of the health valuation literature have been expanded. The first is a more systematic evaluation of the main body of the literature, which is associated with using wage rate differentials reflecting differential workplace risks. Mrozek and Taylor (2002) have performed a meta-analysis of 38 labor market studies contributing 203 estimates of the value of a statistical life (VSL). They find that EPA's best estimate for VSL ($6 million of 1998 dollars) is three times too large (that is, their best estimate is $2 million), owing to a number of factors. The most important is a false attribution of wage rate differentials to mortality rate differences, when in fact, much of this variation is due to inter-industry differences in wage rates that occur for other reasons.

The second is some new studies in the mortality risk valuation literature (for example, Hammitt and Graham, 1999; Krupnick et al, 2002; Strand, 2001; Johannesson and Johansson, 1996) that are specifically designed to reflect the mor-

[4] Although the scenarios do reflect the basic trends in population and economic growth across the country over the relevant time periods, they do not allow for the possibility that people would respond to pollution by moving away from the dirtiest areas.

tality risks associated with air pollution using survey techniques, rather than using estimates from labor markets, a context and population far different than that appropriate to air pollution. Much of this literature also suggests that EPA's $6 million estimate for VSL is too high (a factor of three to six too high would not be out of line) with the appropriate adjustment being quite uncertain, as this literature needs to mature. Additional context adjustments, say for the dread associated with cancer or other diseases and deaths caused by air pollution, could result in higher VSLs, however.

Omissions. Although both studies attempt broad coverage, there are some notable omissions, largely because of data or modeling limitations. Emissions of hazardous air pollutants are not extensively considered in either study.[5] Estimates for Title VI of the 1990 Amendments regarding stratospheric ozone depletion are developed in the prospective study but they are not fully integrated into the main analysis.

Despite efforts to characterize the impacts of air pollution on natural systems, the inability to quantify and/or monetize the damages precluded the development of benefits estimates for ecosystem impacts (except for a supplementary calculation for avoided costs of nitrate reductions associated with NO_X emissions). A similar story applies to potential carcinogenic and certain other health effects associated with criteria pollutants.

Poorly Estimated Costs. Costs are estimated as increases in expenditures by different entities to meet the additional control requirements of the 1990 Amendments, including operation and maintenance expenditures plus amortized capital costs (that is, depreciation plus interest costs associated with the existing capital stock).[6] Changes in employment and prices as well as impacts that might be experienced among customers of the firms that must incur these costs were partially examined in the retrospective analysis but omitted in the prospective study. In limiting consideration of these so-called general equilibrium effects, the EPA reports effectively preclude analysis of the tax interaction effect, which reflects the economy-wide result of imposing additional costs in the context of existing (distortionary) taxes.

This effect was extensively discussed by the expert review committee of the prospective study, and is mentioned in the study, but is not incorporated quantitatively. The tax interaction effect (Parry and Oates, 2000) refers to the effect of increased control costs on the deadweight loss associated with our existing system of labor and other taxes. The slight rise in the cost of living slightly lowers real wages, with aggregate losses being quite large because there are so many people affected.[7] Costs may be significantly underestimated on this account. At the same, the difficulties of forecasting future technological changes (and EPA's current practice of fixing technology) probably leads to an overestimate of costs (Harrington, Morgenstern, and Nelson, 2000).

In summary, while significant challenges remain to estimate the cost and benefit performance of the Clean Air Act and its Amendments, there are as many reasons for expecting that net benefits will be higher than estimated as lower than estimated, with the net effect awaiting further research. Clearly, new benefits will be larger in some elements of the act than in others, a discussion to which I now turn.

Performance of Specific Elements of the Clean Air Act

A final approach to examining performance of the Clean Air Act is to consider some of the evidence on individual elements of the act. This examination will be highly selective, mostly choosing topics about which I have some expertise.

SO_2 Allowance Trading. The SO_2 Allowance Trading Program in Title IV is an unmitigated net benefit and has lead the way to a revolution in thinking about the use of market-based instruments for pollution control. Research at RFF and elsewhere has examined the workings of this program in great detail.

We find that the lion's share of benefits results from reduced risk of premature mortality, especially through reduced exposure to sulfates, and these expected benefits measure several times the expected costs of the program (Burtraw et al, 1998). Although emission trading in theory could have environmental impacts, "the geographic consequences are not consistent with the fears of the program's critics . . . pollutant concentrations decrease and health benefits actually increase in the East and Northeast due to trading . . . Deposition of sulfur in the eastern regions also

[5] Some pilot analyses of hazardous air pollutants were conducted but it was determined that the poor quality of the available information precluded comprehensive quantification of the effects.

[6] Costs for meeting Title IV through the SO_2 trading program were estimated by a model that allocates emissions reductions cost effectively in a context of responding to market signals in the electric power and tradable allowance markets.

[7] One committee member estimated that costs of implemented the 1990 Amendments could be 30% higher than shown in the report.

decreases." (Burtraw and Mansur, 1999). Meanwhile, "allowance trading may achieve cost savings of $700-$800 million per year compared to 'enlightened' command-and-control . . . (and) annual savings of almost $1.6 billion" compared with a less enlightened command-and-control alternative of forced scrubbing. "Innovation accounts for a large portion of these cost savings . . ." involving ". . . organizational innovation at the firm, market and regulatory level and process innovation by electricity generators and upstream fuel suppliers." (Carlson et al, 2000). Although some of these innovations were already in the works prior to the program, the allowance trading program deserves significant credit for providing the incentive and flexibility to accelerate and to fully realize exogenous technical changes that were occurring in the industry.

Based on these good results, it is fair to say that EPA considers trading programs at least equally with traditional command-and-control methods when it considers new regulations. The best recent example is the NO_X trading program, designed to help states implement the NO_X SIP call. Other agencies and stakeholders also think of trading as a cost-effective and politically palatable means of reducing pollution, witness the enthusiasm in some quarters outside of those inhabited by economists, for CO_2 trading, tradable CAFE credits, and the like. The success of Title IV has made this popularity and even "faith" possible.

Yet, the SO_2 trading program and other trading programs could have been made better in hindsight, and could be made better in the future. In particular, the level of the cap could be tied to an economic index, such as allowance prices (Burtraw, 2002). As allowance prices fall, the pace of reduction in emissions could be accelerated to capture low-cost benefits for the environment and public health. Conversely, if allowance prices rise to unanticipated or unjustified levels, the pace of emission reductions could be slowed.

Federal Measures for Mobile Source Emissions Reductions. Another success is the federal measures called for in Title II to reduce emissions of hydrocarbons, CO_2 and NO_X from mobile sources. These measures, such as reformulated gasoline and tailpipe emissions standards, are generally believed to have contributed the dominant share of the emissions-reduction benefits from mobile sources. Reformulated gasoline has the advantage of being relatively low cost and of being applicable to the entire vehicle stock, whereas the tailpipe standards affect only new vehicles. Further, by making new cars more expensive relative to used cars, the tailpipe standards may have contributed some to the dramatic increase in the lifetime of used cars, whose emissions tend to be larger than newer cars. Cost-effectiveness of gasoline reformulated to reduce VOC emissions, for instance, has been estimated to be in the range of $1,900 to $3,900 per ton (Harrington, Walls, and McConnell, 1995). These estimates do not capture the environmental costs associated with MTBE additives nor the subsidies associated with using ethanol. Thus, only some reformulations come this cheaply.

More problematic has been the vehicle inspection and maintenance programs required of some nonattainment areas by the act (Title II). A detailed RFF study of Arizona's enhanced I/M program finds its cost-effectiveness is about $5,500 per ton of NO_X plus VOCs (Harrington, McConnell, and Ando, 2000). Further, the recent NAS study (2001) found that such programs have "generally achieved less emissions than originally projected" (p. 2) and quoted estimates of cost-effectiveness ranging from $4,400 to $9,000 per ton of NO_X plus VOCs. Providing effective and efficient means of finding and repairing dirty vehicles should be a top priority for the future. The near elimination of tailpipe emissions of new cars leaves the maintenance of vehicles as they age the last potentially low-cost area for on-road mobile source emissions reductions. One approach is to rethink the allocation of responsibility for in-use emissions in a more fundamental way, putting more of the emission liability on manufacturers, through extended warranties, emission repair liability, or expanded use of vehicle leasing. Such alternative assignments of liability can perhaps reduce the cost of monitoring and enforcement of I/M, reduce the incentives of motorists to avoid maintenance and repair, and, by providing more flexibility about which vehicles to repair, increase the efficiency of I/M as well.

More problematic still in terms of cost-effectiveness are the various programs to mandate or otherwise promote the use of low-emitting, alternate-fueled vehicles. As shown in a new report (NRC, 2002, appendix F), projected costs per ton of reductions from these vehicles range from a low of $6,000 up to nearly $100,000 per ton of VOCs plus NO_X reductions. Of course, to meet the NAAQS may require implementation of measures with large costs-per-ton reduction and, specifically referring to alternate-fueled vehicles, these costs are likely to come down significantly with technological change and mass production. Nevertheless, what is important is whether cheaper means for such reductions are left unimplemented and whether

changes in program design for the implemented programs could reduce costs, raise effectiveness, or both.

Federal Measures for Point-Source Emissions Reductions. Aside from SO_2 trading and the future trading program, the regulation of point source emissions has been effected by the New Source Review (NSR) program and nonattainment level permit activities related to the SIP. While the NSR program has undoubtedly spurred new abatement and low-polluting process technology, as was intended, these emissions reductions have come at a high cost. As with mobile sources, tighter standards applied to new sources relative to old sources create a bias against capital turnover, leaving possibly dirtier capital in place for far longer than it would have been with a more balanced treatment of sources. Further, with cap-and-trade programs in place, such as those for SO_2 nationally, RECLAIM in Los Angeles, and NO_X in the northeastern United States, NSR is simply redundant. Forcing new sources to meet a tight technology-based standard will only reduce the demand for allowances, lowering their price below what they would otherwise be. While the individual new sources will have lower emissions with NSR than without it, other sources will have greater emissions, since total emissions are capped. On net, exposures over time and space will be different, but not clearly higher or lower.

The SIP Process. The SIP process has probably not worked very well. This is not necessarily the fault of the Clean Air Act. At the time the Act and its Amendments were passed, the magnitude of long-range pollution transport was not known and was assumed to be small. Now we understand that ozone and its precursors, as well as the finer particulates and their precursors can travel many hundreds of miles (or more) making the process of placing responsibility for attainment on the shoulders of individual nonattainment areas (even with all the federal measures in place) problematic. Figures 2 and 3 show some recent results from a state-of-the-art air quality model (Mendoza-Dominguez, and Russell, 2000; Yang, Wilkenson, and Russell, 1997) that integrates ozone and aerosol chemistry into a highly spatially and temporally disaggregated model of ozone and fine particulate concentrations. These figures show how much population-weighted particulate and ozone concentrations in a state can be cut by reductions of SO_2 and NO_X emissions, respectively, in each of the states.[8] The figures clearly show that several nearby states are substantially involved in other states' pollution and that the local (own-state) share of concentrations is only around 20 to 25%.

The lawsuits that have resulted to get long-range sources under control are another indication of the problems with the SIP process. A Federal Advisory Act Committee (USEPA, May 1998), which John Seitz at OAQPS and I co-chaired, spent many hours trying to develop alternatives to this process, recognizing that there were areas of violation and areas of influence, that needed to form the basis for a new way of reaching attainment.

The National Ambient Air Quality Standards. Of course, the centerpiece of Clean Air legislation from 1970 onwards has been the National Ambient Air Quality Standards. By meaning such standards to be enforceable, Congress tagged them as the driving force in air quality regulation. As such, it is perhaps unsurprising that they have come under so much criticism, both on the basis of the criteria for setting them and for the criteria that may not be used. In spite of the recent Supreme Court ruling against the use of cost-benefit analysis and economic efficiency as a criterion for standard setting, it still remains the case that the criteria for setting standards in the absence of a threshold are not defined, if not indefinable. Tighter and tighter standards are not necessarily in the country's best interests. Arguably, as EPA's Regulatory Impact Analysis for Ozone and Particulate Matter shows, it might have been better to have a new ozone standard no tighter than the current one and a fine particulate standard even tighter than the new one.

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[8] In our study area of the eastern U.S., NO_X emission reductions also reduce $PM_{2.5}$ concentrations, but only about 1/10th to 1/20th as much as SO_2 on a ton for ton basis. These estimates and those in Figures 2 and 3 are for an often-studied meteorological episode in July 1995. These figures result from simulating a 1,000 ton reduction of either SO_2 or NO_X emissions in each state and examining the reduction in 24-hour $PM_{2.5}$ and 8-hour ozone concentrations for a given state. The height of the bars gives the concentration reduction that results from this case. These very large reductions in NO_X cause at most a 12.7 ppb reduction in ozone concentrations, for instance.

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Table 2: Summary of Quantified Primary Central Estimate Benefits and Costs

(Estimates in million $1990s)

Cost or Benefit Category	Annual Estimates		Present Value
	2000	2010	
Costs:			
Title	$8,600	$14,500	$85,000
Title II	$7,400	$9,000	$65,000
Title III	$780	$840	$6,600
Title IV	$2,300	$2,000	$18,000
Title V	$300	$300	$2,500
Total Costs, Title I-V	$19,000	$27,000	$180,000
Title VI	*$1,400	.....	*$27,000
Monetized Benefits:			
Avoided Mortality	$63,000	$100,000	$610,000
Avoided Morbidity	$5,100	$7,900	$49,000
Ecological and Welfare Effects	$3,000	$4,800	$29,000

Table 2: Summary of Quantified Primary Central Estimate Benefits and Costs—Continued

(Estimates in million $1990s)

Cost or Benefit Category	Annual Estimates		Present Value
	2000	2010	
Total Benefits, Title I-V	$71,000	**$110,000**	$690,000
Stratospheric Ozone	*$25,000	.....	*$530,000

* Annual estimates for Title VI stratospheric ozone protection provisions are annualized equivalents of the net present value of costs from 1990 to 2075 (for costs) or 1990 to 2165 (for benefits). The difference in time scales for costs and benefits reflects the persistence of ozone-depleting substances in the atmosphere, the slow processes of ozone formation and depletion, and the accumulation of physical effects in response to elevated UV-b radiation levels.

Source: EPA, 1999. The Benefits and Costs of the Clean Air Act, 19902010.

Table 3. Summary of Cost-Benefit Studies of the 1990 Clean Air Act Amendments for 2010

(estimates in million $1990).

Study	Benefits	Costs
Title IV		
Burtraw et al (1998)[1]	$25,000	$800
Chestnut (1995)	$35,277	NA
New NAAQS (EPA, 1997)[2]		
Ozone (8-hr.), partial attainment	$400-$2,100	$1,100
Ozone (8-hr.), full attainment	$1,500-$8,500	$9,600
Fine Particulates, partial attainment	$19,000-$104,000	$8,600
Fine Particulates, full attainment	$20,000-$110,000	$37,000
Clean Air Act Amendments (Smith, 1999)[3]		
Title I	$26,564	$14,500
Title II	$14,968	$9,000
Title III	$1,925	$840
Title IV	$69,297	$2,000

[1] While this estimate is specific to the eastern United States, these benefits are expected to account for 98% of total U.S. benefits.

[2] Partial attainment costs are incremental to partial attainment of current standards, and reflect partial attainment of promulgated standards. EPA estimates 17 potential residual nonattainment areas for ozone, and 30 potential residual nonattainment counties for fine particulates as of 2010. Full attainment costs, however, are incremental to full attainment of current standards.

[3] Total 1990 Amendments benefit estimate ($110 billion; see table 2 above, in bold) and cost estimates by title (see table 2, above) are from EPA (1999).

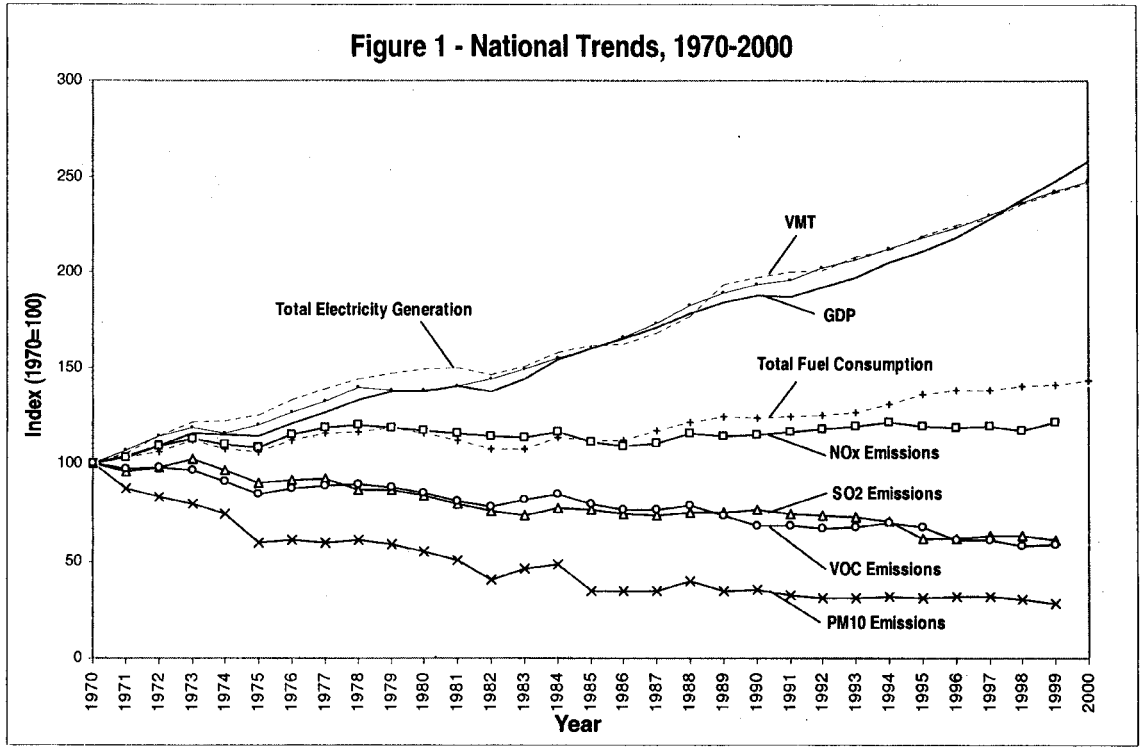
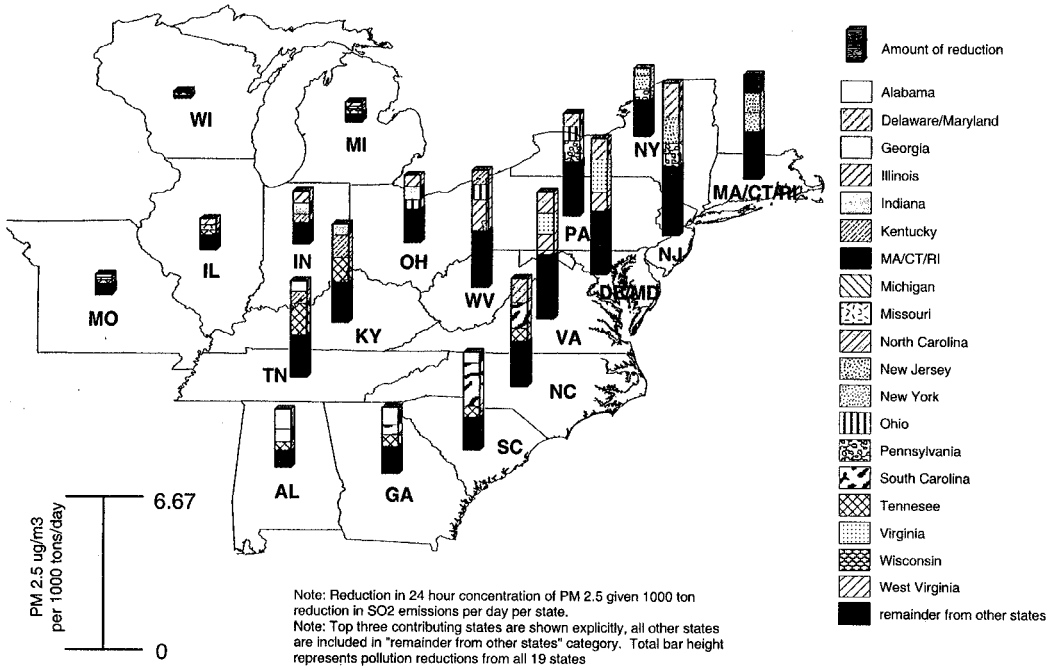


Figure 1 - National Trends, 1970-2000
Index (1970=100)
300
250
200
150
100
50
0
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
Year
VMT
GDP
Total Electricity Generation
Total Fuel Consumption
NOx Emissions
SO2 Emissions
VOC Emissions
PM10 Emissions

Figure 2

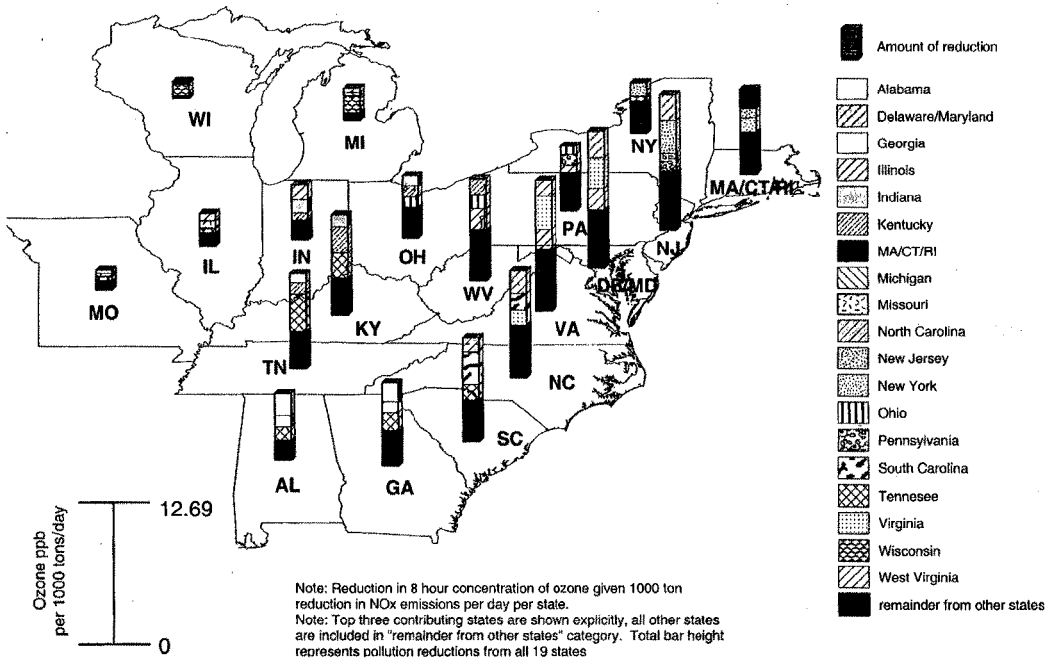
Interstate Effects of Reductions in SO2 Emissions on Fine Particulate Matter Concentrations



Note: Reduction in 24 hour concentration of PM 2.5 given 1000 ton reduction in SO2 emissions per day per state.
Note: Top three contributing states are shown explicitly, all other states are included in "remainder from other states" category. Total bar height represents pollution reductions from all 19 states

Figure 3

Interstate Effects of Reductions in NOx Emissions on Ozone Concentrations



Note: Reduction in 8 hour concentration of ozone given 1000 ton reduction in NOx emissions per day per state.
Note: Top three contributing states are shown explicitly, all other states are included in "remainder from other states" category. Total bar height represents pollution reductions from all 19 states

Mr. BARTON. Thank you, sir.

Now we have a pending vote on the floor. If Mr. Driesen will pretty stay within his 5 minute rule, we can give Mr. Boucher a chance to ask a question, myself a chance to ask a question, and then you folks can go have lunch, and we can adjourn the hearing. So with that as an incentive, we want to recognize Mr. David Driesen, who is an Associate Professor from Syracuse University, and he is here to testify.

Your statement is in the record. We would ask that you summarize it in 5 minutes.

STATEMENT OF DAVID M. DRIESEN

Mr. DRIESEN. Thank you, Mr. Chairman, members of the subcommittee. I appreciate the opportunity to testify today on the accomplishments of the Clean Air Act.

The 1990 amendments have improved public health, ameliorated environmental impacts. We have reduced emissions of almost all the pollutants the amendments target, often quite substantially, and this represents a major achievement.

To my mind, the most stunning success story is actually the phaseout of ozone depleting chemicals to protect the stratosphere ozone level. That, if we continue along that path, is probably going to solve the problem.

I agree that acid rain has also been a successful program, and we have reduced criteria pollutants as well. But the new scientific research indicates that ozone and soot are causing more death, more asthma than we had thought and, as a result, EPA has had to revise those standards.

Because you are going to be thinking about power plant emissions, I think it is important to understand what the Act is going to bring in the way of future power plant regulation. First of all, the State's Attorney General and the Justice Department are now enforcing previously under-enforced New Source Review requirements, and these actions, if they continue, will bring about substantial reductions in power plant emissions.

Second, EPA is about to begin an emissions trading program for nitrogen oxide in the northeast and midwest, which will also bring about significant reductions beginning in 2003. Finally, States in order to achieve the national ambient air quality standards, the revised ones, are going to have to regulate sulfur dioxide and nitrogen oxide from utilities.

With respect to hazardous air pollutants, we have achieved very large reductions. The old program only succeeded in listing eight pollutants. Congress listed 189 that States and local agencies had associated with serious health effects like cancer and birth defects, and in just over 10 year we got far more reductions from far more pollutants than we ever saw, in a much faster fashion than we ever saw before the 1990 amendments.

EPA has just begun work on a second phase which is designed to eliminate residual risk. It will involve some risk assessment.

EPA will be regulating power plant mercury emissions for the first time in 2004 under the toxics program. I think that is important background to evaluating the proposals on power plant emissions.

The major challenge for the future, though, and the major failure of the Clean Air Act, has been the failure to address greenhouse gas emissions. In marked contrast to the rest of the Act, these have risen some 14 percent since 1990, because we have relied entirely upon voluntary efforts.

That is a serious problem, because scientists are telling us that it is clear that the climate is warming, that we can expect more heat waves which translates to worse summer smog programs, making the States' job in achieving criteria of pollutant standards more difficult. We can expect that there may be floods, droughts and the spread of infectious diseases if we don't address this problem, and every year we wait, it gets more serious, because once we put this carbon into the atmosphere, it stays there. So there is no going back. So that, to my mind, is the most serious gap in the amendments.

So to conclude, the States and EPA have made significant progress in protecting public health and the environment. They are in the midst of implementing a number of programs that promise to deepen and continue that progress, but we have a major gap in not addressing carbon dioxide from utilities and greenhouse gas emissions in general.

[The prepared statement of David M. Driesen follows:]

PREPARED STATEMENT OF DAVID M. DRIESEN, ASSOCIATE PROFESSOR, SYRACUSE UNIVERSITY COLLEGE OF LAW

The question of how well the 1990 Amendments have succeeded in protecting public health and the environment from air pollution is very important. Air pollution is associated with tens of thousands of annual deaths, afflicts many millions more with asthma and lung disease, poses risks of cancer and birth defects, and causes neurological damage. In addition, air pollution destroys forests, acidifies lakes, and damages crops. Finally, air pollution warms the climate. Climate change will likely exacerbate summertime smog and therefore increase the frequency and severity of asthma and heart attacks, while creating potential new catastrophes—flooding of islands and coastal areas, destruction of eco-systems, droughts, and the spread of tropical diseases.[1] Unfortunately, greenhouses gases, once released, remain in the atmosphere for decades, so delay in addressing this problem has irreversible consequences.

I'm pleased to report that the 1990 Amendments have improved public health and ameliorated environmental impacts. We have reduced emissions of most of the pollutants the Amendments target, often quite substantially. This represents a major achievement, for this progress occurred in spite of increased population and in conjunction with high economic growth. Furthermore, the 1990 Amendments require further actions that will build on this progress.

Stratospheric Ozone Depletion

The most stunning success came from efforts to protect people from skin cancer and cataracts by combating the depletion of the stratospheric ozone layer, which shields us from ultraviolet rays. We eliminated the production of many substances contributing to depletion of the ozone layer high in the atmosphere, as did other countries around the world. While a hole has opened up in the ozone layer, scientists tell us that it probably will heal as a result of this vigorous response. Because we have not proceeded as aggressively on other issues, our success in other areas, while impressive, has been somewhat more limited.

Acid Rain

The acid rain program, which combines very specific Congressional decisions about limits with emissions trading confined to well-monitored pollutants, has also proven enormously successful. It has reduced sulfur dioxide at much lower cost than predicted. While acid deposition has declined as a result, lakes and forests have

[1] *See* Intergovernmental Panel on Climate Change, Climate Change 2001: Synthesis Report (Cambridge University Press 2001).

been slow to recover.[2] Further planned cuts in sulfur dioxide and nitrogen oxides, the principal causes of acid rain, will aid recovery.

Smog and Soot: The Criteria Air Pollutants

The Clean Air Act relies upon a combination of state regulation and federal vehicle controls to address problems caused by pervasive health impairing criteria pollutants. These pollutants include soot (or particulate), ground level (i.e. not stratospheric) ozone, and carbon monoxide. Because of these efforts, levels of all of these pollutants have declined between 1992 and 1999 by the levels indicated below:

Percentage Decline Criteria Pollutants: 1992-1999 [3]

Carbon Monoxide	2%
Particulate Matter: 10 Microns or Less	13%
Particulate Matter 2.5 Microns or Less	7%
Ozone	4%

[3] EPA, National Air Quality and Emissions Trends Report, 1999 Appendix A (2001).

As a result, only one area in the country violated the carbon monoxide standard in 1999. A sizable number of the moderately polluted areas have achieved the ozone and particulate standards in effect in 1990, but many metropolitan areas with large populations continue to violate these standards. The 1990 Amendments anticipated that seriously polluted areas would comply by 1999 (they haven't), but expected that areas suffering severe or extreme ozone pollution probably would not comply by 2002.

Unfortunately, new scientific research associates ozone and particulate pollution with even more cases of death, asthma and lung disease than were apparent in 1990. More than 100 million Americans still do not have clean healthful air to breathe. Accordingly, EPA has recently revised national ambient air quality standards for particulate and ozone. Implementation of these standards will take some time, but promises to improve this situation.

The national ambient air quality standards serve as goals for state pollution control programs. They establish the maximum concentration of pollutants EPA deems tolerable in the air that surrounds us. States regulate emissions of pollution sources in order to bring about the needed improvements in ambient air quality. Because state decisions about which regulatory strategies to use affect cost, costs will vary from state to state. And because local air quality varies, so do state air quality control programs. This is not a one-sized fits all approach, and it unfolds slowly.

Because utility nitrogen oxide and sulfur dioxide emissions contribute enormously to violations of the new national ambient air quality standards, states will have to control these emissions in order to meet the new standards. These substantial reductions will contribute not only to human health, but also to efforts to combat acid rain.

Quicker results will likely come from federal and state efforts to enforce new source review requirements against power plants that have evaded strict federal controls while renovating dirty old plants. The 1970 Amendments reflect a compromise, exempting existing stationary sources (e.g. factories) from federal controls, while imposing controls on new sources. Congress expected that as plant owners replaced or modernized their facilities relatively stringent new source controls would apply, which would improve air quality over time. It has frequently been said that new source review has discouraged modernization. The attorneys general of several states and the Justice Department, however, have found that electric utilities have modernized their facilities, but did not comply with new source review requirements.

Furthermore, EPA has begun to administer an emissions trading programs to reduce nitrogen oxide emissions in many northeastern and midwestern states. This program focuses primarily upon electric utilities and anticipates reductions beginning in 2003. Nitrogen oxide has risen since 1990, probably because of increased driving, use of diesel fuel, and increasing energy use, so we need additional controls. This trading program, while directed toward compliance with the old ozone standard, will also ameliorate acid rain and reduce particulate pollution. The nitrogen oxide trading program, new source review enforcement, and state regulation to comply with the revised national ambient air quality standards should bring about sub-

[2] *See* Charles T. Driscoll et al., *Acidic Deposition in the Northeastern United States: Sources and Inputs, Ecosystem Effects, and Management Strategies,* 51 BioSciences 180 (2001); Charles T. Driscoll et al., *Acid Rain Revisited: Advances in Scientific Understanding Since the Passage of the 1970 and 1990 Clean Air Act Amendments* (Hubbard Brook Research Foundations, 2001).

stantial reductions of utility nitrogen oxide and sulfur dioxide emissions, which should greatly reduce death, illness, and ecosystem damage.

Hazardous Air Pollutants

We have also apparently achieved large reductions in emissions of hazardous air pollution.[4] Prior to 1990, the federal program in this area had been moribund, because it relied heavily upon risk assessment. In twenty years, EPA succeeded in listing only eight hazardous air pollutants for regulation. The 1990 Amendments tried a broader approach. Congress listed 189 substances that state and local government agencies had linked to cancer and other serious health effects and directed EPA to regulate them in two phases.[5] The first phase, a technology-based phase, is mostly complete. In just over ten years, EPA stimulated much greater decreases in hazardous air pollutants, and the risks of serious illness associated with them, than it had achieved in the twenty years preceding the 1990 Amendments. While EPA has not often met the numerous statutory deadlines governing this massive program, it has experienced nothing like the enormous delays that routinely riddled the pre-1990 implementation process.[6] Moreover, the breadth of the new program offers better protection, because people breathe in a mixture of carcinogens and a broad approach is needed to protect them from the combined effects of many different pollutants.

EPA has just begun work on a second phase, designed to eliminate the residual risks of cancer, birth defects, and other serious illness remaining after the first round cuts. This second phase requires regulation to protect public health with an ample margin of safety, employing a precautionary approach to public health.

While the 1990 Amendments generally required two rounds of cuts for all sources of listed pollutants, it contained a temporary exemption for mercury emissions from electric utilities. This provision required a study and a discretionary decision about whether to regulate toxics from electric utilities.[7] While EPA decided to regulate mercury and other hazardous air pollutants from electric utilities, it made that decision very late (2000) and has not yet completed the regulation. Nevertheless, EPA has committed to regulating mercury from electric utilities by the end of 2004, which should provide substantial reductions protecting public health and the environment from mercury. This commitment to a utility "maximum achievable control technology" (MACT) standard is extremely important, because mercury accumulates in the environment and can cause many serious health problems in human beings.

Challenges for the Future

While we have made progress, the air program still has gaps and weaknesses. We have failed to effectively address greenhouse gas emissions, which rose approximately 14.1% between 1990 and 2000, in spite of voluntary efforts to address the problem.[8] The greenhouse gas emissions rose because the Clean Air Act Amendments of 1990 did not address them.

The overwhelming majority of this pollution comes from a single class of activities—burning fossil fuels. We burn massive amounts of coal in order to generate electricity. We refine gasoline and then burn it in automobiles and other kinds of engines. Fossil fuel consumption accounted for 82 percent of greenhouse gases in the 1990s, the gases that contribute to climate change.[9] Carbon dioxide emissions from fossil fuel combustion are almost evenly divided between industrial uses, transportation, and residential and commercial buildings, with electric utilities (which burn energy used for both industry and buildings) contributing about 36% of the carbon dioxide.[10]

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[4] Id. The Toxics release inventory shows a decline of hazardous air pollutants of 39% between 1992 and 1999. Much of this data is imprecise, because of a lack of comprehensive monitoring. The information respecting hazardous air pollutants represents reporting by a small subset of toxic emitters (albeit ones with especially large emissions) using estimation methods of the operators' choosing. *See* EPA, Toxic Release Inventory 1999: Executive Summary, E-10-11 (2001). TRI data may exclude some reductions required by EPA and include some reductions made for other reasons (such as state standards).

[5] 42 U.S.C. § 7412(b)(2).

[6] *See e.g.* Natural Resources Defense Council v. EPA, 705 F. Supp. 698, 703 (D.D.C. 1989) (discussing a ten year delay in promulgating a benzene standard).

[7] 42 U.S.C. § 7412(n).

[8] U.S. EPA, Greenhouse Gas Emissions and Sinks: 1990-2000, E-2 (2002).

[9] *See* United States EPA, Inventory of U.S. Greenhouse Gas Emissions and Sink: 1990-1999 at ES-3 n. 6 (2001). This figure refers to gases weighted by global warming potential. Carbon dioxide from fossil fuel combustion alone accounted for 80% of weighted emissions. Id. at ES-3.

[10] Id. at ES-15 (Industrial end-use sector 33 percent, transportation, 31 percent, residential and commercial end uses 35%).

We have not implemented sufficiently demanding and comprehensive standards to encourage significant changes in how we generate electricity. Such changes would address climate and reduce growing damage to public health and the environment.

We need to improve monitoring of hazardous air pollutants and volatile organic compounds. All of the risk assessment in the world will not clarify the health effects of hazardous air pollution, unless we know much more about what people are breathing than we know now. Quantitative assessment of poorly understood risks simply masks what we do not know with seemingly precise, but quite unreliable, numbers.

Finally, the air program relies heavily upon state regulation. But EPA has proven extremely reluctant to enforce state obligations. As a result, the significant progress achieved through state programs has amounted to something less than the 1990 Amendments envision. More demanding and specific direct federal regulation of nationally significant pollution sources like power plants would certainly help. But Congressional support for state delivery of environmental benefits to the public will remain essential.

CONCLUSION

The states and EPA have made significant progress in protecting public health and the environment. They are in the midst of implementing a number of programs that promise to deepen and continue this progress.

Mr. BARTON. Thank you, Mr. Driesen for being brief. I really sincerely appreciate that.

We are going to recognize Mr. Whitfield for one question, and we are going to recognize Mr. Boucher for one question, and then we will adjourn the hearing. We will have a series of written questions for all of you. Mr. Whitfield. And we have 7 minutes and 21 seconds to get to the floor to vote.

Mr. WHITFIELD. Thanks, Mr. Chairman.

Mr. Krupnick, I notice in your testimony you talk quite a bit about acid rain and also the need for further regulation of CO_2 emissions. I have read in a number of publications that methane, for example, has a lot of greenhouse properties, by some estimates even 30 times the warming potency of CO_2.

Are you all advocating the regulation of methane emissions as well?

Mr. KRUPNICK. Sorry. In my testimony, I didn't mention CO_2 emissions. It is maybe Mr. Driesen.

Mr. WHITFIELD. Oh, I am sorry. Mr. Driesen, okay.

Mr. DRIESEN. Well, I think eventually Congress should come to grips with the full range of greenhouse gases. While methane is very potent, 80 percent of the emissions on a carbon weighted basis are carbon dioxide. They are of the most important. There is so much of it.

So I think there is a need to look at the issue in general. I think carbon dioxide is the most high priority target, but we probably will eventually need to do more about a bunch of gases.

Mr. WHITFIELD. Now——

Mr. BARTON. This will have to be your last question.

Mr. WHITFIELD. Okay. The National Acid Precipitation Assessment Program, which was the world's longest, largest, and most expensive and spanned almost a decade, involved 700 scientists and cost $500 million, and they did a survey of various trees, Virginia pines, tulip poplars and white oaks, and they exposed them to high concentrations of acid rain, and they planted them in soils that were much less rich than normal soils in forests.

Yet the results came back that, even with precipitations almost 10 times as acidic as the average acid rain in the eastern U.S., that

all of those trees grew even as a normal tree would grow, which left a clear—The conclusion was that there is no case of forest decline in which acidic deposition is known to be a predominant cause.

Mr. DRIESEN. Yes. I would disagree with that. I guess what I could offer to add to the record on this is some work by Charles Driscoll, Syracuse University and Hubbard Brook Research Center on this. It shows that there have been impairment of growth from acidification of soils.

So I think there is a pretty strong case that it has been a problem for trees, and it has certainly been a problem for lakes and streams. What we found is that we have had a reduction in acid deposition, thanks to the 1990 amendments, but the ecosystems have been slow to recover. That is a major reason that we need more——

Mr. BARTON. We are going to have to recognize Mr. Boucher very quickly.

Mr. BOUCHER. Thank you very much, Mr. Chairman. I am going to be very brief.

Mr. Goffman, I have one question of you. I know you were very much involved in the preparation of the cap and trade program for SO_2 as we wrote the amendments in 1990, and you have a long experience in having helped originate that program and also watched its implementation.

What happened that made it such a great success? We achieve more in terms of benefits. We achieve more in terms of cost than was originally anticipated. What was the element that made it so successful, and do you think that we should consider applying it to other kinds of pollutants; and if so, which ones?

Mr. GOFFMAN. What made it so successful, in my personal view, is that we changed—made a significant legal change. Sources became legally liable for controlling their actual emissions, and for nothing else. We didn't use surrogates. We used actual emissions.

We made a change, an economic change. We literally created a market for extra reductions in pollution. It made sense to make those investments economically.

I would suggest that, as a long range transport pollutant, SO_2 should be further ratcheted down under a cap and trade model. Same with oxides of nitrogen. Same with greenhouse gases. I am puzzled, however, as to why anyone is proposing that mercury be regulated in this way, because I think the atmospheric characteristics of mercury are significantly different.

Mr. BARTON. We are going to conclude the hearing. My question that I will submit in writing, and each of you can answer, goes to what Mr. Krupnick was talking about, where we haven't really identified the vehicles that are causing most of the vehicular pollution.

I had an amendment to the Act that allowed the use of what we now call the "smog dog," but it hasn't been very widely implemented. I will ask that there be some discussion on that.

Normally, we would ask a series of questions. I apologize, but we have 2 minutes and 7 seconds to get to the floor for three votes. So we are going to adjourn the hearing, but there will be written questions to each of you. Thank all of you gentlemen for attending.

This hearing is adjourned.

[Whereupon, at 1:13 p.m., the subcommittee was adjourned.]

[Additional material submitted for the record follows:]

RESPONSES OF THE EPA TO QUESTIONS OF HON. HENRY A. WAXMAN

IMPLEMENTATION OF THE NAAQS

Question 10. States and localities have expressed concerns regarding how they will attain the new NAAQS for 8-hour ozone and fine particles. Several key sources of cost-effective emissions reductions will require federal measures, which it is up to EPA to implement. Critical federal measures include the following: (1) adoption of rigorous PM and NO_X emission standards for heavy-duty nonroad diesel engines that are based on the technology advances in the heavy-duty onroad diesel sector, and adoption of corresponding requirements for low sulfur diesel fuel that will enable the new technology; (2) issuance of a SIP call for SO_2, which is critical to lower harmful concentrations of fine particles; and (3) issuance of a SIP call to "annualize" the summertime NO_X abatement program, which will lower harmful NO_X emissions year-round in a highly cost-effective way.

a. Does EPA intend to adopt federal measures to help states and localities attain the new NAAQS?

b. Does EPA intend to adopt each of the measures described above?

c. If not, what measures does EPA intend to adopt?

Answer: EPA believes that federal measures are an extremely important component of an overall strategy to help the states attain the new 8-hour ozone and PM 2.5 standards. The most efficient way to control mobile sources of emissions and major long range transport sources of emissions is through national rules. Over the past 30 years EPA has set increasingly more stringent standards for motor vehicles that are used on our streets and highways. In addition, the 1990 amendments to the Clean Air Act gave EPA new authority to establish emission limits for nonroad engines and equipment. As a result, EPA has adopted national emission control programs for the following nonroad equipment: locomotives, marine vessels, outboard recreational boats, and small gasoline engines used in lawn and garden equipment. The Agency is currently working on regulations that will dramatically reduce emissions from large, nonroad diesel engines used in construction, mining, airport and agricultural equipment.

EPA's preferred approach to control long range transport of SO_2 and NO_X is through legislative changes to adopt our Clear Skies initiative. As an alternative, we plan to prepare to implement an annual SIP call for SO_2 and NO_X.

d. What is EPA's planned schedule for proposing and finalizing each of the federal measures identified by the Agency? If additional technical work is necessary prior to proposal of any measure, please describe the nature, scope, and planned timing for such work, including identifying any interim milestones that must be met for the measures to be adopted in a timely manner.

Answer: i) *Emission standards for large diesel engines used in nonroad equipment:* EPA is currently preparing draft regulations and supporting analyses that would establish nationally-applicable requirements for this category. One of the major issues that is being considered is the potential need to lower the sulfur levels in nonroad diesel fuel to enable new exhaust control technology to be utilized on future engines. The Agency plans to submit draft proposed rulemaking for interagency review by the end of this year. ii) *SIP Call for SO_X and NO_X*: EPA is currently evaluating the steps and timing necessary to develop and implement a SIP Call for SO_2 and NO_X. We have not yet developed a schedule to finalize a SO_2/NO_X SIP Call.

e. In particular, how will EPA address the problem of interstate transport of pollution, which states do not have authority to regulate directly?

Answer: As previously discussed, we believe the best approach for addressing interstate transport of pollution is through enactment of Clear Skies legislation. However, because such legislation has not been addressed in Congress yet, EPA is working in parallel to conduct technical analyses to support a SIP Call for SO_X and NO_X.

REVIEW OF THE CLEAN DIESEL RULE

Question 25: As you know, EPA's clean diesel rule was recently upheld by the D.C. Circuit against all challenges from industry. However, I am concerned that EPA may be considering reopening this important rule. According to press reports, EPA has convened a Clean Diesel Independent Re-

view Panel. Reportedly, this panel will begin meeting on May 23 and report its findings to EPA in September.

a. Please provide information on this review panel, including the charge of the panel, the schedule for meetings, and its membership.

Answer: The Clean Diesel Independent Review Panel was created by a charter issued under the Clean Air Act Advisory Committee, which was originally established on November 19, 1990 in accordance with the requirements of the Federal Advisory Committee Act (FACA).

The purpose of the panel is to provide independent advice to the Agency on industries' progress in developing and demonstrating technologies that will be used to reduce engine exhaust emissions and to lower the sulfur level of highway diesel fuel in accordance with the regulations establishing the Clean Diesel Program.

Specifically, the objectives of the panel's charter are to assess the progress of:

i) manufacturers of diesel engines and emission control systems in developing technology to reduce engine exhaust pollutants, and;

ii) the fuels industry in developing and demonstrating technologies to effectively lower the sulfur level of highway diesel fuel.

The panel is composed of leading experts from the public health community, petroleum refiners, fuel distributors and marketers, engine manufacturers, emission control systems manufacturers, and state governments. The panel will hold meetings, analyze issues, conduct reviews, make necessary findings, and undertake other activities necessary to meet its responsibilities. The panel has been requested to produce a final report by the panel charter's expiration date of September 30, 2002.

The first meeting of panel is scheduled for May 23, 2002, in Alexandria, VA. Other information can be found on the panel's web site (http://www.epa.gov/air/caaac/clean—diesel.html).

Future panel meeting dates are as follows: Thursday and Friday, June 27 & 28; Tuesday and Wednesday, July 30 & 31; and Tuesday and Wednesday, September 24 & 25.

Panel members are listed in the following table:

Federal Advisory Committee Act—Clean Air Act Advisory Committee

Clean Diesel Independent Review Panel

Panel Chairman	Designated Federal Official
Mr. Daniel Greenbaum, President, Health Effects Institute	Ms. Mary Manners, Chemical Engineer, U.S. Environmental Protection Agency
Ms. Josephine Cooper, President and CEO, Alliance of Automobile Manufacturers.	
Mr. Pat Charbonneau, Vice President, Engineering, Navistar International Transportation Corporation.	Dr. John Wall, Vice President, Research and Development, Cummins Engine Company, Incorporated
Mr. Bruce Bertelsen, Executive Director, Manufacturers of Emission Controls Association.	Dr. Timothy Johnson, Manager, Emerging Technology and Regulations, Corning, Incorporated
Mr. Tom Bond, Director, Global Fuels Technology, BP	Mr. Michael Leister, Manager, Fuels Technology, Marathon Ashland Petroleum LLC
Ms. Sally Allen, Vice President, Administration & Governmental Affairs, Gary-Williams Energy Corporation.	Mr. Bob Neufeld, Vice President, Environment and Governmental Relations, Wyoming Refining Company
Mr. James Kennedy, Manager, Project Sales Distillate and Resid Technologies, UOP LLC.	Mr. Alan Wright, Vice President, Pilot Travel Centers LLC
Mr. Bill Becker, Executive Director, STAPPA/ALAPCO	Mr. Tom Cackette, Assistant Executive Officer, State of California Air Resources Board
Mr. Paul Billings, American Lung Association	Mr. Rich Kassel, Natural Resources Defense Council
Dr. Bob Sawyer, Professor of the Graduate School, University of California at Berkeley, Department of Mechanical Engineering.	Mr. Mike Walsh, Consultant

b. Does EPA anticipate that the clean diesel rule could be modified as a result of this panel's review?

Answer: The panel will submit a report of its findings to Administrator Whitman in September of this year. The Agency will thoroughly review these findings. In addition, EPA will conduct its own annual review of progress toward implementation of the program requirements. The Agency does not anticipate the need to modify the regulations. The program provides adequate lead time before the requirements take effect. The adequacy of the lead time was recently affirmed by the court.

Question 26. According to a recent press report, the American Petroleum Institute (API) is seeking to expand the scope of the Panel's review and to

change the composition of the Panel in order to seek weakening changes to the regulations. Will EPA expand the scope of the Panel's review as API has requested? Will EPA change the composition of the Panel in response to API's request?

Answer: The Agency has consistently stated that the issues for review would be limited to the review of progress in developing the technologies needed to meet the program standards. The Charter provided to the Independent Review Panel reflects that commitment. We believe the composition of the panel is balanced and fairly represents all major stakeholders.

IMPLEMENTATION OF TITLE V

Question 27. The Inspector General of EPA recently issued a report on the extensive delays in state issuance of permits under the Title V program. The Inspector General found that eleven years after the adoption of Title V, only 70% of the sources have permits as required. The Inspector General also made a number of recommendations as to how EPA should improve the Title V program.

a. What actions are you taking to respond to the Inspector General's recommendations? Please describe how each of these actions will further the objectives of the Title V program and indicate the anticipated timing for each specific action identified.

Answer: EPA will reevaluate our role in overseeing the implementation of the title V programs in States. Our regulations authorize us to review State programs for compliance with the requirements of part 70. Through our Fiscal Year 2003 annual program guidance, we will ask all ten Regional Offices to commit to performing multiple permit program evaluations each year, based on an evaluation protocol. These evaluations will be tailored to the unique circumstances of each State. The evaluations would investigate in detail those areas of a State's program which the Regional offices consider to be contributing to the State's permit issuance rates. Regions would be expected to follow up with the States as necessary after completing the evaluations. Areas of the permitting program that we would expect to evaluate include lessons learned from issuing permits, good practices concerning implementation, impediments to prompt and thorough permit preparation and issuance, issues concerning staffing and resources, issues concerning the ease of translating Maximum Available Control Technology (MACT) standards into permit terms, and the fee protocol, among other things. Target date for this effort is to have the evaluation protocol developed by October 2002 with the evaluations beginning in FY 2003 and extending over the following few years. This effort furthers the objectives of Title V by working toward faster issuance of better permits.

EPA has a specific mandate to work with STAPPA and develop implementation tools for certain MACT standards. The website http://www.epa.gov/ttn/atw/eparules.html is devoted to information about many of the MACT standards and associated implementation tools. Selecting the hypertext link for any of about 40 rules in this section of the website results in access to information explaining individual rules and includes implementation details designed specifically for State permit writers such as self-paced interactive training, fact sheets, and even some State-developed training materials. Thus we feel we have done our best in writing permit friendly MACTs. However, we will continue to investigate why some permitting authorities still contend that MACTs are not permit friendly. We will do this through the evaluations described in the previous paragraph. This effort furthers the objectives of Title V by working to improve the implementation of air toxic regulatory terms and conditions as described in operating permits.

EPA intends to continue including a requirement for the Regional Offices of EPA to input Permit Program Data Elements in AIRS as a part of the annual Air Program Guidance prepared for the Regional Offices. As necessary, changes will be made to that annual requirement to gain additional insights into measures of progress in permit issuance. The data elements which we routinely collect have proven over time to be sufficient to manage permit issuance and to answer questions from EPA management and the public concerning the status of State permitting programs. These data are publicly accessible on our website and are updated quarterly. This is an ongoing effort. This effort, while addressing the Inspector General's recommendation, does little to further the objectives of Title V, and merely provides up-to-date information on the numbers of permits issued over time.

Pursuant to the November 2000 settlement agreement with the Sierra Club, we gave citizens an opportunity to comment on State program deficiencies. A number of comments were received on permit issuance. The Agency decided that the most efficient way to deal with this issue was to require State agencies to submit

issuance schedules with trackable milestones for those States that received such citizen comments. These schedules were submitted with the understanding that EPA could issue Notices of Deficiency (NOD's) if the milestones were missed. It is still EPA's plan for the Regional Offices to proactively manage those schedules, including tracking interim milestones, and identifying reasons why milestones are missed. Based on those schedules, it is our plan to issue NOD's for missed milestones and schedules. We will include in the FY 2003 annual air program guidance a requirement that the Regional Offices manage and report progress against these schedules. Should NOD's be needed, they will likely occur at the midway point or end date of the schedule. The target date for completion of this work is December 2003. This effort furthers the objectives of Title V by ensuring consistency in the implementation of permitting programs across the country, and highlighting States that are behind schedule in order to improve permit issuance.