

**THE STATE OF THE ENVIRONMENT:
EVALUATING PROGRESS AND PRIORITIES**

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND
TECHNOLOGY
HOUSE OF REPRESENTATIVES
ONE HUNDRED THIRTEENTH CONGRESS

FIRST SESSION

THURSDAY, FEBRUARY 14, 2013

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**THE STATE OF THE ENVIRONMENT:
EVALUATING PROGRESS AND PRIORITIES**

THURSDAY, FEBRUARY 14, 2013

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON ENVIRONMENT
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY,
Washington, D.C.

The Subcommittee met, pursuant to call, at 10:05 a.m., in Room 2318 of the Rayburn House Office Building, Hon. Andy Harris [Chairman of the Subcommittee] presiding.

LAMAR S. SMITH, Texas
CHAIRMAN

EDDIE BERNICE JOHNSON, Texas
RANKING MEMBER

Congress of the United States
House of Representatives

COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY

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Subcommittee on Environment

The State of the Environment: Evaluating Progress and Priorities

Thursday, February 14, 2012

10:00 a.m. -11:30 a.m.

2318 Rayburn House Office Building

Witnesses

The Honorable Kathleen Hartnett White, Distinguished Fellow-in-Residence & Director,
Armstrong Center for Energy & the Environment, Texas Public Policy Foundation

Mr. Richard Trzupek, Principal Consultant, Trinity Consulting

Dr. Bernard Goldstein, Professor and Dean Emeritus, University of Pittsburgh Graduate School of
Public Health

U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
 Subcommittee on Environment

HEARING CHARTER

The State of the Environment: Evaluating Progress and Priorities

Thursday, February 14, 2013

10:00 a.m. – 11:30 a.m.

2318 Rayburn House Office Building

Purpose

On Thursday, February 14, 2013, the Subcommittee on Environment will hold a hearing to assess broad environmental trends and indicators, including an examination of factors such as air and water quality, chemical exposure, environmental and human health, and climate change. Witnesses are asked to provide their perspective on progress and challenges on these environmental trends as they relate to research and development, regulation, technological innovation, energy use and Americans' changing standard of living.

Witnesses

- **The Honorable Kathleen Hartnett White**, Distinguished Fellow-in-Residence & Director, Armstrong Center for Energy & the Environment, Texas Public Policy Foundation
- **Mr. Richard Trzupek**, Principal Consultant, Trinity Consulting
- **Dr. Bernard Goldstein**, Professor and Dean Emeritus, University of Pittsburgh Graduate School of Public Health

Overview

Since many environmental statutes were enacted in the 1970s and 1980s, there have been significant improvements in virtually all major environmental indicators in the United States. For example, the aggregate emissions for the six criteria air pollutants regulated under the Clean Air Act have dropped 63 percent since 1980. Over the same period, America's Gross Domestic Product increased 128 percent, energy consumption increased 26 percent, population grew by 37 percent, and vehicle miles traveled increased 94 percent.¹ See Chart 1 for a Comparison of Growth Areas and Emissions, 1980-2011.

These trends are also reflected in other metrics, including enhanced water quality, reduction of toxic chemical exposure, decreased carbon intensity, energy intensity, forest size, land use, and biodiversity. For many of the traditional pollutants regulated under statutes such as the Clean Air Act and Clean Water Act, virtually all of the less-expensive environmental improvements have been achieved. One of the questions to be discussed at this hearing will be the estimated costs for additional, proposed EPA reductions and how much incremental benefit might be attained.

A systematic process for evaluating the state of the environment, environmental priorities at EPA, or conducting comprehensive retrospective analyses on environmental progress has yet to be

¹ <http://www.epa.gov/airtrends/aqtrtrends.html>

developed. The last “Report on the Environment”² by the EPA’s National Center for Environmental Assessment was completed in 2008. The EPA has not conducted a comprehensive assessment of the highest-priority environmental issues, especially where limited research and regulatory resources should be directed, since the early 1990s.

Further hampering the assessment of general environmental health is the lack of data available to make such evaluations. For example, the EPA abandoned a two-decade long National Water Quality Inventory due to inconsistent and low quality data collection in 2004. In its place, the EPA implemented the Wadeable Streams Assessment (WSA), measuring 20 categories of water conditions through a random sampling of 1,300 streams and small rivers across the U.S. However, questions have been raised about the utility of this assessment.

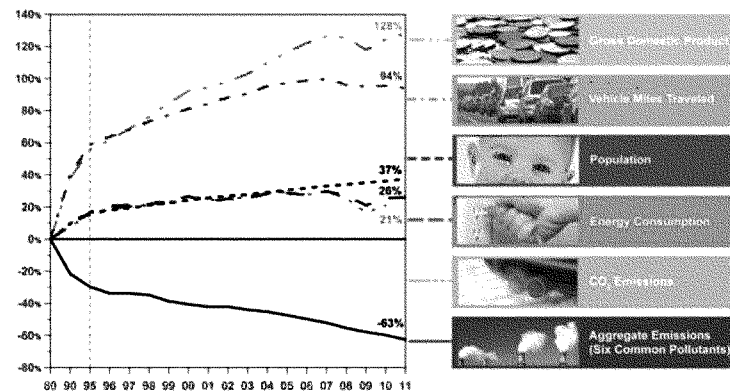
This hearing will examine these trends and indicators, explore what progress is still needed in order to protect human health and the environment, and consider how best such advances may be accomplished.

Additional Reading

[EPA National Center for Environmental Assessment](#)

[American Enterprise Institute 2011 Almanac of Environmental Indicators](#)

Chart 1. Comparison of Growth Areas and Emissions, 1980-2011³.



² <http://www.epa.gov/roc/>

³ <http://www.epa.gov/airtrends/aqtrnds.html#comparison>

Chairman HARRIS. The Subcommittee on Environment will come to order.

Good morning. Welcome to today's hearing entitled "The State of the Environment: Evaluating Progress and Priorities." In front of you are packets containing the written testimony, biographies and Truth in Testimony disclosures for today's witness panels. I recognize myself for five minutes for an opening statement.

Good morning. Welcome to the first hearing of the Environment Subcommittee in 2013. It is not only the first hearing in 2013, it is the first hearing of the Environment Subcommittee. As you know, the Committee reorganization separated Energy and Environment Subcommittee into two, and this is the Environment Subcommittee.

Our hearing today is entitled "The State of the Environment: Evaluating Progress and Priorities." I first want to recognize and welcome our new ranking member, Representative Suzanne Bonamici from Oregon, as well as our new Vice Chairman, Chris Stewart from Utah. Of course, we all welcome the gentleman from Texas, the Chairman of the Science, Space, and Technology Committee, Mr. Lamar Smith. I look forward to working with all the Members on the Subcommittee on a myriad of environmental issues in the 113th Congress.

Today we are going to talk about the greatest story never told. In the last four decades, Americans have witnessed dramatic improvements in the environmental health of this country. This is characterized by the improvement in air and water quality, less exposure to toxic chemicals, and growing forest areas, to name a few. All the while, the United States has experienced significant growth in GDP and per capita income. This progress is due to a number of factors including technological innovations, state and local efforts, and to some degree, the rational implementation of federal regulations.

Just 2 days ago would have been the 82nd birthday of Julian Simon, renowned economist from the University of Maryland. His most important insights were that the world is getting better all the time and that energy serves as the "master resource" for those improvements. I couldn't agree more. My children are growing in a much healthier world than the one where I grew up. However, despite the substantial progress made in environmental health and quality of life, Americans are constantly bombarded by the media and this Administration with doomsday predictions. For instance, we have been told that extreme storms and increased childhood asthma are indicators that the environment is worse off than ever. These allegations fly in the face of the hard facts, that severe weather has always been a threat and that our air quality has improved dramatically. These invented crises and the mentality around it prove what another fellow Marylander and columnist for the Baltimore Sun, H.L. Mencken wrote, and I quote, "The whole aim of practical politics is to keep the populace alarmed and hence clamorous to be led to safety by menacing it with an endless series of hobgoblins, all of them imaginary."

So what is the solution to this disconnect between reality and what we are being told? How do we work together on continuous

to enhance environmental health without needlessly scaring our constituents or stifling our floundering economy?

First, I believe we must recognize and educate people about the incredible progress made so far. Since 1980, aggregate emissions of the six criteria air pollutants regulated under the Clean Air Act have dropped 63 percent. Over a similar period, there has been a 65 percent reduction in toxic release of chemicals tracked by the EPA. Other indicators demonstrate a similar trend of reduced environmental risk.

Second, we must acknowledge that most of the gains made in environmental health thus far were changes that were affordable, or if they had high costs, the associated benefits were clear, significant, and cost-effective. Future progress will not likely be so easily identified, will be extremely costly and benefits may be unquantifiable. For example, the latest round of increasingly burdensome regulations may result in the closing of power plants, reducing manufacturing production and sending American jobs overseas. We are already seeing employers react to proposed EPA regulations in this manner. What is not included in the government's analysis is the added cost of regulations to consumers resulting in higher energy and food bills or the inevitable hardships that occur when companies are forced to reduce their workforce. Once these two tenets are accepted, that the environment is getting better and that even well-intended actions may harm the economy, we can begin to prioritize the research and development and regulatory agenda that actually protects human health and the environment without crippling the economy.

In light of the President's pledge in this week's State of the Union that he will "direct my Cabinet to come up with executive actions we can take now and in the future to reduce pollution," it is critical that any such actions be based on good, transparent science and not on imaginary hobgoblins.

I look forward to hearing from our witnesses on how to balance quality science and need for regulation with true economic costs and benefits. Thank you.

[The prepared statement of Mr. Harris follows:]

PREPARED STATEMENT OF CHAIRWOMAN ANDY HARRIS

Good morning. Welcome to the first hearing of the Environment Subcommittee in 2013: The State of the Environment: Evaluating Progress and Priorities. I want to recognize and welcome our new Ranking Member, Representative Suzanne Bonamici from Oregon, as well as our new Vice-Chairman Chris Stewart from Utah. Of course, we all welcome the gentleman from Texas, Chairman of the Science, Space, and Technology Committee Lamar Smith. I look forward to working all the members of the subcommittee on a myriad of environmental issues in the 113th Congress.

Today we are going to talk about the greatest story never told. In the last four decades, Americans have witnessed dramatic improvements in the environmental health of this country. This is characterized by the improvement in air and water quality, less exposure to toxic chemicals, and growing forest areas, to name a few. All the while, U.S. has experienced significant growth in GDP and per capita income. This progress is due to a number of factors, including technological innovations, State and local efforts, and to some degree, the rational implementation of Federal regulations. Just two days ago would have been the 82nd birthday of Julian Simon, renowned economist from the University of Maryland. His most important insights were that the world is getting better all the time and that energy serves

as the “master resource” for those improvements. I could not agree more. My children are growing up in a much healthier world than the one where I grew up.

However, despite the substantial progress made in environmental health and quality of life, Americans are constantly bombarded by the media and this Administration with doomsday predictions. For instance, we have been told that extreme storms and increased childhood asthma are indicators that the environment is worse off than ever. These allegations fly in the face of the hard facts that severe weather has always been a threat and that our air quality has improved dramatically. This invented crisis mentality prove what another fellow Marylander and columnist for the Baltimore Sun, H.L. Mencken wrote, “The whole aim of practical politics is to keep the populace alarmed (and hence clamorous to be led to safety) by menacing it with an endless series of hobgoblins, all of them imaginary.”

So what is the solution to this disconnect between reality and what we are being told? How do we work together on continuing to enhance environmental health without needlessly scaring our constituents or stifling our economy? First, I believe we must recognize and educate people about the incredible progress made so far. Since 1980, aggregate emissions of the six criteria air pollutants regulated under the Clean Air Act have dropped 63 percent. Over a similar period, there has been a 65 percent reduction in toxic releases of chemicals tracked by EPA. Other indicators demonstrate a similar trend of reduced environmental risk.

Second, we must also acknowledge that most of the gains made in environmental health thus far were changes that were affordable, or if they had high costs, the associated benefits were clear, significant, and cost effective. Future progress will not likely be so easily identified, will be extremely costly, and benefits may be unquantifiable. For example, the latest round of increasingly burdensome regulations may result in the closing of power plants, reducing manufacturing production and sending jobs overseas. We are already seeing employers react to proposed EPA regulations in this manner. What is not included in the government’s analysis is the added cost of regulations to consumers, resulting in higher energy and food bills, or the inevitable hardships that occur when companies are forced to reduce the workforce.

Once these two tenets are accepted—that the environment is getting better and that even well intended actions may harm the economy—we can begin to prioritize a research and development and regulatory agenda that actually protects human health and the environment without crippling the economy. In light of the President’s pledge in the State of the Union that he will “direct my Cabinet to come up with executive actions we can take, now and in the future, to reduce pollution,” it is critical that any such actions be based on good, transparent science and not on imaginary hobgoblins.

I look forward to hearing from our witnesses on how to balance quality science and need for regulation with true economic costs and benefits.

Chairman HARRIS. I now recognize the Ranking Member, the gentlewoman from Oregon, Ms. Bonamici, for an opening statement.

Ms. BONAMICI. Thank you, Chairman Harris, for holding the Subcommittee’s first hearing on the state of our environment. This hearing marks an important opportunity to plan for the future, to set the tone for the new Congress in what I hope will be a collaborative effort to ensure our long-term economic vitality and to protect human health and our natural resources.

It is a matter of common sense that we must coordinate research and technological innovation to enhance air and water quality to protect the health of our children and future generations. The 1st District of Oregon, which I represent, is a leader in this area, as it is in many fields. In fact, in June of last year, the U.S. Conference of Mayors gave Beaverton, Oregon, the Mayors’ Climate Protection Award, and later that city received EPA’s 2012 Leadership Award. The State of Oregon has additionally shown that it is committed to protecting human health by reducing harmful emissions, with a statewide goal of reducing greenhouse gas emissions to ten percent below 1990 levels by 2020, and 75 percent below 1990 levels by 2050.

I have read the testimony of the witnesses and their biographies, and I am glad you have come to this Committee. Both the majority witnesses have enjoyed long careers in the regulatory sector, and I understand from talking to environmental regulators at both the state and federal level that the process of implementing regulations can be both challenging and daunting work. With that said, this Subcommittee, and this hearing in particular, should focus on the science that has led to the successful EPA regulations that are acknowledged by all three witnesses, and those discoveries that are still unknown that may tell us more about how the pollution in our air and water is affecting our health.

As technology changes and as our research methodology becomes more accurate, as industries change and new industries are created, as populations grow, new problems will continue to emerge. We will not have all the answers immediately, but as public servants it is our responsibility to continue to investigate.

More than 40 years ago, Congress passed several pieces of landmark legislation to protect our environment: the National Environmental Policy Act, the Clean Air Act and the Clean Water Act. All of these laws passed with bipartisan support. In 1970, it was President Richard M. Nixon who is credited with creating the Environmental Protection Agency, and the EPA became the lead federal agency with responsibility for implementing these laws and today works in collaboration with other federal and state agencies to protect human health and our environment.

Today, we will hear from our panelists and Subcommittee Members on the costs and benefits of environmental protection. Although there are serious questions on which we may disagree, we can all agree that our air and water is cleaner than it was 40 years ago, before the Clean Air and Clean Water Acts became law. But our work is not done.

As we look ahead to future EPA action, including the issuance of new and updated regulations, it is worth reminding ourselves of the source of such regulation and the benefit to society. In that regard, the Clean Air Act's history of protecting public health speaks for itself. In the four decades since it was signed, the Clean Air Act has prevented hundreds of thousands of premature deaths, not to mention saving trillions of dollars in health care costs. These benefits to the public will continue to grow. Especially in tough economic times, Americans understand the real economic impact. With fewer cases of chronic asthma attacks or bronchitis, fewer children and adults have to visit hospitals or doctors' offices. With the cost of health care widely agreed to be one of the central drivers of our Nation's fiscal challenges, we as policymakers would consider this a good result.

The economic impacts of climate change are among the many challenges we face in these times of budget uncertainty. One of the most important issues to address will be how these changes will draw on our resources. If we do not have reliable, scientific information about the impact of climate change, our industries, our farmers, our states and our municipalities will be unable to plan for the future. I know that all of my colleagues agree that certainty is good for business.

The environmental laws that we are discussing in this hearing have hardly been the drag on the economy that some predicted when they were passed in the 1960s and 1970s. When Congress rewrote the Federal Water Pollution Control Act in what became the Clean Water Act, one of the biggest threats to our water quality was municipal wastewater. A bipartisan Congress took a very important step by including funding provisions for states and cities to help them build wastewater treatment facilities. It is widely accepted among environmental experts across the country, and noted by all of our witnesses, that cleaning up our Nation's waterways has been one of the great successes of the Clean Water Act. In fact, both majority witnesses make mention of economic growth in the face of environmental regulation in their testimony, using data provided by the EPA. Over the last 20 years, while emissions of the six principal air pollutants were reduced by an additional 41 percent, the Nation's Gross Domestic Product has increased by more than 64 percent. Additionally, GDP has risen by more than 200 percent since the Clean Air Act was signed more than 40 years ago. We not only got cleaner air, but also entirely new technology sectors.

Investment in environmental science, research, education and assessment efforts have been key to promulgating smart, effective regulation, and good science has been critical to protecting the environment as well as human health since the 1970s. Air and water pollution continue to threaten our public and economic health, and we need strong science and research programs, both at NOAA and EPA, to help us understand the problems and respond.

I am interested in hearing how Congress and this Subcommittee can best develop programs that suit the needs of our federal agencies, academic institutions and other research and development institutions, while continuing to provide the necessary information to make informed policy decisions. President Richard Nixon, who signed the Clean Air Act Amendments in 1970, said, "I think that 1970 will be known as the year of the beginning, in which we really began to move on the problems of clean air and clean water and open spaces for the future generations of America."

Significant progress has been made, and it is now our job now to build upon this legacy and ensure that we will continue to improve our environmental quality while bolstering our economy. This is not science fiction; it is our history. In the United States, a healthy environment and a strong economy are not mutually exclusive. Stricter pollution limits drive us to push the envelope of scientific innovation and create new technologies, and it has been proven many times over, that it can simultaneously improve worker productivity, increase agricultural yield, reduce mortality and illness, and achieve other economic and public health benefits that far outweigh the costs of compliance.

Thank you, Mr. Chair.

[The prepared statement of Ms. Bonamici follows:]

PREPARED STATEMENT OF RANKING MINORITY MEMBER SUZANNE BONAMICI

I want to thank Chairman Harris for holding the subcommittee's first hearing on the state of our environment. This hearing marks an important opportunity to plan for the future, to set the tone for the new Congress in what I hope will be a collabo-

rative effort to ensure our long-term economic vitality and protect human health and our natural resources.

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Quoting Republican President Nixon, who signed the Clean Air Act Amendments into law in 1970: "I think that 1970 will be known as the year of the beginning, in which we really began to move on the problems of clean air and clean water and open spaces for the future generations of America."

Significant progress has been made in the past 40 years, and it is our job now to build upon this legacy and ensure that we continue to improve our environmental quality while bolstering our economy. This is not science fiction; it is our history. In the U.S., a healthy environment and a strong economy are not mutually exclusive. Stricter pollutions limits drive us to push the envelope of scientific innovation and create new technologies. And, as it has been proven many times over, they can simultaneously improve worker productivity, increase agricultural yield, reduce mortality and illness, and achieve other economic and public health benefits that far outweigh the costs of compliance.

Thank you, and I yield back.

Chairman HARRIS. Thank you, Ms. Bonamici.

If there are Members who wish to submit additional opening statements, your statements will be added to the record at this point.

At this time I would like to introduce our witnesses. Our first witness is the Hon. Kathleen Hartnett White, Distinguished Fellow-in-Residence and Director for the Armstrong Center for Energy and the Environment at the Texas Public Policy Foundation. Prior to joining the foundation, Ms. White served a six-year term as Chairman and Commissioner of the Texas Commission on Environmental Quality, the second largest environmental regulatory agency in the world after the United States Environmental Protection Agency. Prior to joining that commission, she served on the Texas Water Development Board. She also served on the Texas Economic Development Commission and the Environmental Flow Study Commission.

Our next witness will be Mr. Richard Trzupek, Principal Consultant and Chemist at Trinity Consultants. Mr. Trzupek has worked in the environmental industry for 30 years, first as a Stack Tester measuring the amounts of air pollutants emitted from industrial smokestacks and then as an Environmental Consultant to small and midsized businesses. Mr. Trzupek is the author of numerous articles and books on environmental issues and air quality.

The final witness today is Dr. Bernard Goldstein, Professor and Dean Emeritus at the Graduate School of Public Health at the University of Pittsburgh. He is a physician board certified in internal medicine, hematology and toxicology. He has also served as Assistant Administrator for EPA's Office of Research and Development from 1983 to 1985.

As our witnesses should know, spoken testimony is limited to five minutes each after which the Members of the Committee will have five minutes each to ask questions.

I now recognize Ms. White to present her testimony.

**STATEMENT OF THE HONORABLE
KATHLEEN HARTNETT WHITE,
DISTINGUISHED FELLOW-IN-RESIDENCE & DIRECTOR,
ARMSTRONG CENTER FOR ENERGY & THE ENVIRONMENT,
TEXAS PUBLIC POLICY FOUNDATION**

Ms. WHITE. Thank you, Chairman Harris, for the opportunity to testify on this I think extremely important but often-neglected topic on the state of our environment at this point in time and the remarkable record. I also thank Chairman Smith, a fellow Texan, and Congressman Weber. I am very proud to call you Congressman. We miss you in Texas right now but I am very proud to call you Congressman Weber.

I also appreciate being called to testify as a former state regulator who for six years main job was implementing federal regulations that bind the state. When you are in the state, you are close to the people, the businesses and the real lives that these regulations affect and where the proverbial rubber meets the road.

Whenever I look at it, I am again really taken by the magnitude of the environmental improvement in this country over the last 40 years, particularly over the last 20. I have a slide up from, I think, an excellent and rare book called the Almanac of Environmental Trends. This is from the 2011 edition by Steven Hayward that I recommend highly to you as a broad assessment of environmental conditions and trends across environmental media. This is a slide from that book just comparing there major social policies: the extent of the population on welfare, the crime rate and the amount of reductions in aggregate emissions, the lower green line. You see the incredible trend there. I would say also this has data from federal sources until 2007 that you would see a sharper decline in the last, really last five years. There has been very significant decline. You would see a very slight uptake in the crime rate and you would see, unfortunately, a measurable increase in the welfare rolls.

I am not going to repeat what the Chairman has already said in terms of the quantity of reduction in the criteria pollutants, EPA's main job implementing National Ambient Air Quality Standards, but a look at some of these numbers is really, really amazing. If you notice, ambient levels are what are important because that is the level of emissions that actually impact people: 76 percent in sulfur dioxide, 82 percent in carbon monoxide, 90 percent reduction of lead, some amazing numbers.

I guess I am repeating what you previously said but the fact that this amount of air quality improvement went on during periods of very robust economic growth I think is very noteworthy. I would add to the achievement with the criteria pollutants that emissions from our tailpipes have been reduced by about 90 percent while vehicle miles traveled increased 165 percent as a result of better engine design and fuel formulations.

Right now, virtually the entire country attains at least four of the six criteria pollutants federal standard. Some urban areas still wrestle with ozone and fine particulate matter but the trends are all positive. But as an example of improvement, in 1997 EPA list-

ed, I believe it was 113 metropolitan areas that were nonattainment for one of the criteria pollutants. That number has now fallen to 30. I also cannot resist a Texas example. Houston, Texas, home of now the world's largest petrochemical industrial complex with Gulf Coast meteorology that is the perfect recipe for high ozone formation did something nobody said it could do, and we resisted many controls EPA wanted us to put on. We used cutting-edge science to figure out what is exactly our problem in Houston, how does ozone form. We did very creative, targeted controls, very aggressive regulation, but that slide shows you that what happened, which no one thought, was under the then-current standard 85 part per billion, Houston attained that standard in 2009 and 2010. In 2011, historic heat, historic drought, ozone levels went up again. They are already coming back down but I think there is a wonderful story about how the state with a really broad team effort—legislature, universities, industries, communities—figured out how to do that.

I want to give just a few examples, although there is not time in this oral testimony—my written testimony goes in more detail—but again, the magnitude of improvement. Lead is an amazing thing—almost eliminated. But consider the health benefit. In the 1970s, the CDC found that 88 percent of children between one and five years had lead blood levels that exceeded the CDC's risk limit. In 2006, that is now 1.2 percent. Lead as a risk to health has been virtually eliminated. Dioxins, a big family of chemical compounds, which if exposure is right and concentration is right, can be very damaging to human health, according to EPA's data, down 92 percent. Mercury: mercury emissions in this country have been already reduced, and this is before EPA's new mercury rules in effect, by 60 to 70 percent, and the CDC now finds, and this is the next slide—whoops, I am a little out of order. There we go. This is based on CDC's, again, a blood survey of mercury levels in the blood of women of childbearing years. Those levels from the most recent survey that goes to 2008 are well below EPA's new standard that is two to three times stricter than the mercury standard by the World Health Organization or the U.S. Food and Drug Administration. Benzene, which is the most prevalent of the hazardous pollutants and is a known carcinogen, has been—as a national average, those are down by over 64 percent. In Texas—and this is the next slide—it was a big issue in our petrochemical areas. The upper line, dotted line, was a previous level and also that is the level the state sets for when you really need to consider the health effects. Again, through an intensely monitored air quality monitored system in that area, the Houston-Galveston area, we have taken—those are all the black lines are individual monitors, and not only is it a positive trend for the area overall, you see how far below. That probably amounts to an average of 87 percent reduction of ambient benzene emissions. I could go on and on.

I might say that of course EPA regulation played a major role in this, but were it not for the prosperity in our country, I think it would be impossible for this achievement. The creative technologies, the operational efficiencies that are hallmarks of the private enterprise in the free market were absolutely necessary for this, and if you compare environmental progress in developing

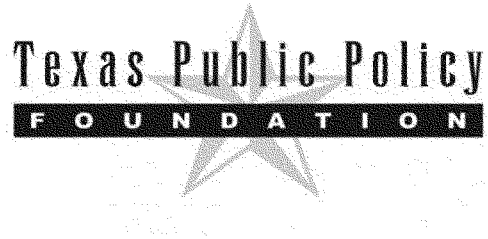
countries, the difference is unbelievable. My testimony notes in a World Bank list of the world's worst polluted cities, in which there are about 100 cities on each list. I will give you just one example, it was a list for sulfur dioxide. The highest level was in Guiyang, China, assigned a level, according to that methodology, of something like 424, and Los Angeles was the last one on the list with a level of 9, 50 times difference. We are very, very fortunate to have the prosperity that enables our businesses and our consumers to absorb the costs of environmental regulation.

So where are we and what would I recommend as a path going forward? More robust science. I think we have reached a point at which what I call the harder sciences that can demonstrate actual cause like toxicology, medical science, clinical trials are necessary to support the path going forward. EPA has recently——

Chairman HARRIS. If you could wrap it up?

Ms. WHITE. I have submitted also with my testimony a paper I did on what I consider a troubling, scientifically unjustified inflation of risks that EPA now used to justify new regulation and to implausibly calculate monetized benefits. I think it is time for harder science, for more intense monitoring, physical measurements and not models.

[The prepared statement of Ms. White follows:]



The State of the Environment: Evaluating Progress and Priorities

Testimony

Before the

**Committee on Science, Space and Technology
Subcommittee on the Environment
U.S. House of Representatives
Washington, D.C.**

February 14, 2013

By

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Introduction

Thank you Chairman Harris and fellow members of the Environment Subcommittee for the opportunity to testify on the critically important but far too neglected topic of this hearing: The State of the Environment: Evaluating Progress and Priorities. As a former chief state environmental regulator in Texas, whose job for six years was to implement federal environmental regulations, I thank you for the opportunity to share a perspective developed in the arena where the regulatory rubber meets the road in towns, businesses, homes, and real individual lives across Texas.

Although rarely heard, the environmental record of the U.S. is one of dramatically improving air and water quality. The U.S. environment has now achieved a state in which the most dangerous risks from polluted air and contaminated water are largely eliminated. Of course, there are exceptions in specific locations and days when air pollution may temporarily rise in a specific place. And of course the regulatory effort to reduce environmental risks to human health should continue, but the record should give us environmental optimism. The consistently positive trend began in the early 1960s even before the enactment of the major federal environmental laws in the early 1970s.

Assessment of the actual conditions of our physical environment today and measurement of the effectiveness of the massive web of regulations imposed under the main federal environmental laws enacted over forty years ago is, regrettably, a neglected topic in the policymaking debates of the day. The current leadership of the EPA apparently thinks that our environment is so severely polluted that risk of death abounds. Over the last four years, during which EPA has promulgated regulations unprecedented in number, infeasible stringency, and cost, the former Administrator repeatedly told the public that air quality was so bad that aggressive new regulation was necessary to prevent the deaths of thousands people.

In October 2011 on the Bill Maher show, the former Administrator noted, "We are actually at the point in many areas of this country where on a hot summer day, the best advice is don't go outside. Don't breathe the air. It might kill you."¹ In a similarly hyperbolic vein, she told this subcommittee, "If we could reduce particulate matter to levels that are healthy, it would have identical impacts to finding a cure for cancer." The American public needs an exhaustive explanation of this assertion. In recent years, cancer has caused the death of approximately 600,000 real people per year.

In fact, the state of our environment is remarkably improved as is public health. There is far more empirical scientific data supporting the claim of huge strides in environmental health than EPA's chilling assertions about "early deaths." Data available on EPA's own website and in abundant toxicological studies document a radically different story than EPA's alarming assertions of acute environmental peril.

Whether we consider air pollutants, water contaminants, or release of hazardous chemicals, the environmental trend is vigorously positive.

State of the Environment: Air, Water and Toxins

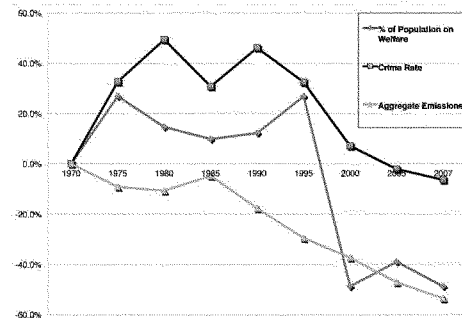
Over the last four decades and particularly over the last two decades, environmental conditions and public health (with few exceptions) have dramatically improved. Regardless of the EPA's exaggerated statements about mortal risks, it is EPA's own data available on the Agency's own website (See "Our Nation's Air—Status and Trends") that documents the improvements.²

Meaningful, timely, and comprehensive assessments of environmental conditions over time are rare. The one exception is Stephen Hayward's "2011 Almanac of Environmental Trends." This peer-reviewed compendium provides current data from official federal sources on a broad range of environmental issues with useful historical background. I understand Dr. Hayward is working on a 2012 edition of the Almanac.

The dramatic improvement in air quality across the U.S. is a major public policy success although one to which the EPA or the media give less than lip service. And while the EPA's regulation under the Clean Air Act played a key role, the main engines driving this transformation were technological advances in emission control and efficiencies—innovations spurred and made possible by economic growth within the dynamics of the free market.

The U.S. now produces much more with less inputs and waste. The prosperity made possible by economic growth has allowed businesses and consumers to absorb the steep cost of elaborate emission controls. Objective science, creative technology, entrepreneurial investments of capital and rapid information exchange—these hallmarks of the free market have—and if allowed to function—will fuel continual environmental enhancements and improved human health. Studies such as the Environmental Performance Index, the Index of Economic Freedom, and the Fraser Institute's Economic Freedom of the World demonstrate that countries which structurally enshrine economic freedom under the rule of clear, limited laws and private property right also achieve environmental quality.³

A Comparison of Crime Rate, Welfare, and Air Pollution, 1970-2007



Sources: Steve Hayward, 2011 *Almanac of Environmental Trends*, (Apr. 2011); FBI Uniform Crime Reports; U.S. Department of Health and Human Services, EPA.

Environmental progress remains an elusive goal for most of the developing countries and heavily centralized governments. In the World Bank's list of the 78 cities with the highest particulate matter pollution (PM), only two U.S. cities appear: Los Angeles (as the 64th highest) and Chicago (as the 78th highest). In this study, Los Angeles has a PM level of 34 micrograms per cubic meter level, while Cairo, as the first city on list, has a PM level at the extremely high level of 169 micrograms per cubic meter.⁴

In the list of cities most polluted by sulfur dioxide (SO₂), Guiyang, China ranks first with a daily mean level of 424 micrograms per cubic meter, while Los Angeles, last on the list of 89 cities, has a level of 9. These values are calculated according to the World Health Organization's standard for SO₂ of 20 micrograms per cubic meter—a standard much higher than EPA's typically far more stringent air quality standards.⁵ I might add that new coal-fired power plants in the U.S. achieve SO₂ levels approximately 95 percent lower than in the early years of the 20th century.

Of course, efforts to maintain and improve air quality should continue. But regulation must be proportionate to current, meaningful risk. And EPA should recognize the remarkable trends in our state's and our nation's air quality, return to sound scientific assessment of remaining health risks, and inform the American people about wholly positive trends in our environmental quality.

Air Quality Improvement

National Ambient Air Quality Standards

EPA data show that since 1970, aggregate emissions of the six criteria pollutants for which the Clean Air Act (CAA) requires National Ambient Air Quality Standards (NAAQS) have decreased by over 60 percent and these emissions are still falling. These air quality achievements occurred while the U.S. Gross Domestic Product (GDP) increased 200 percent. Over the last several decades, tailpipe emissions have been reduced by 90 percent while vehicle miles traveled have increased 165 percent. Improvement will continue with the turn-over vehicles and new equipment.

Virtually the entire country attains four of the six NAAQS. Some urban areas still struggle with attainment of the NAAQS for ozone and fine particulate matter (PM_{2.5}), but the levels and frequencies of exceeding the NAAQS are sharply falling. In the Houston region of Texas, the number of days in the year of exceeding the ozone NAAQS has fallen from a high of 73 days in 1995 to 14 days in 2012. In 1997, the EPA classified 113 metropolitan areas across the country as ozone non-attainment areas. That number has fallen to below 30 metropolitan areas. My analysis is confined to NAAQS in legal effect before current administration's changes. The new NAAQS are not yet in full effect.

Air Quality Improvement 1980-2010

	Ambient 1980-2008	Ambient 1980-2010	Emissions 1980-2008	Emissions 1980-2010
Carbon Monoxide (CO)	-79%	-82%	-58%	-71%
Ozone (O3)	-25%	-28%	-49%	NCD
Lead (Pb)	-92%	-90%	-96%	-97%
Nitrogen Dioxide NO2	-46%	-52%	-40%	-52%
Particulates (PM10)*	-31%	-38%	-46%	-83%
Fine Particulates (PM2.5)**	-21%	-27%	-36%	-55%
Sulfur Dioxide (SO2)	-71%	-78%	-56%	-63%
NCD- No Current Data				
*1990-2010				
**2000-2010				

U.S. Environmental Protection Agency, "Air Quality Trends," January 2012,
<http://www.epa.gov/airtrends/aqtrends.html> (April 18, 2012).

The table above notes the percentage of reduction as a national average from 1980-2010. In some states, like Texas, the reductions are significantly greater. The condition, or trend, of air quality is measured in terms of ambient levels in the air and emission volumes. Emissions are an estimate (typically made by models) of the volume of pollutants released into the air by human activities. The ambient levels are the key measure of health risk because they are a physical measurement of the actual concentration of pollutants in the air to which humans are exposed. Monitors measure ambient levels while models estimate emissions.

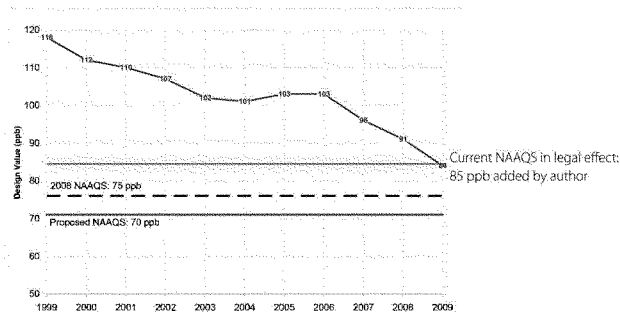
The ambient levels overstate environmental risk because they do not incorporate representative exposure. Most—although not all—pollutants decline by as much as 90 percent indoors. And most people spend 90 percent of their lives indoors. EPA's risk assessments and the ambient standards calculated on the basis of the risk assessments assume exposure to the highest monitored levels 24/7, an indication of how highly protective are the NAAQS.

The big improvement over the two years from 2008 and 2010 is great news but unusual because reductions of this magnitude typically occur gradually. A combination of variables likely accounts for the reductions between 2008-2010. The decrease in economic activity during the recession is likely the greatest cause. Installation of additional emission controls and greater use of renewable energy sources and natural gas also likely contributed.

With the second largest population, six of the 20 largest U.S. cities, economic growth far outpacing the national average, and the largest industrial sector, Texas has reduced ozone levels across the state since 2000 by 23 percent compared to a national average of 13 percent. The Houston region has reduced ozone precursor emissions by at least 85 percent (nitrogen oxides) and 70 percent (volatile organic

compounds). Once vying with Los Angeles as the most ozone polluted city in the country, Houston, Texas—home of the largest petrochemical complex in the world with an optimal climate for ozone formation—attained the 85 parts per billion ozone standard in 2009 and 2010. And Texas is likely to attain the new annual fine particulate matter NAAQS.

Eight-Hour Ozone Design Values for the Houston-Galveston-Brazoria (HGB) Area



*Note: 2009 design values based on average of 2007 to 2009 data. Design values are as of November 13, 2009 and are subject to change.
Source: TCEQ Emission Inventory, Air Quality Division, AMDA; 2010*

Many regard this air quality success in Houston an evanescent anomaly, but it was the result of an elaborately orchestrated team effort by the state. Our legislature, state agencies, local governments, industry, and multiple universities worked collaboratively to design and implement creative technology, market incentives, state-of-the-art science, and targeted regulatory controls. We resisted EPA's one-size-fits-all, over-reaching blueprint to develop a State Implementation Plan addressing the distinctive state/local parameters of our ozone problem and without shackling economic growth. It worked!

The historically record-breaking heat in 2011 sent Texas ozone levels higher, but with more normal weather returning in 2012, ozone levels in every region of the state regained their downward trajectory. And Houston remains only a hair's breadth from the highly questionable 2008 eight-hour ozone standard of 75 ppb. The Dallas area also has seen dramatic reduction and is approaching attainment of the ozone NAAQS.

Increasingly effective emission detection and control technology and huge gains in operational efficiency—driven by the dynamics of the private market place—facilitate this major emission reduction in Texas. With all these controls, heavy industry no longer is the predominant source of smog and soot. Now think tailpipe, not smokestack. Tailpipe emissions from cars, trucks, and construction equipment are the main source of ozone, particulate matter, and some key toxins such as benzene.

Hazardous Air Pollutants (HAPS) and Toxins

The rarely told story of major air quality improvements also includes hazardous or toxic pollutants. EPA's Toxic Release Inventory (TRI) tracks the "releases" of more than 600 chemical compounds from more than 20,000 businesses and industrial facilities across the U.S. EPA's TRI reports that 225 "core" chemical compounds have declined by 65 percent since 1988. Note that the TRI provides no information about whether the public is exposed to hazardous chemicals in a manner potentially harmful to human health. The TRI merely indicates the sharply declining use of hazardous chemicals as a positive trend. Much of the reduction shown by the TRI is a result of efficiencies gained in the petrochemical industries.

Texas has developed a state-specific program to intensely monitor and reduce ambient levels of HAPS. Like most environmental issues, programs designed and implemented by states which have far more detailed and site-specific information are more effective and cost efficient.

Lead

When lead was eliminated from transportation fuels in the late 1970s, ambient concentrations of lead decreased 97 percent. In the 1970s, 88 percent of children ages one through five years had lead levels in their blood above the Center for Disease Control and Prevention's (CDC) threshold of risk to cognitive development. In 2006, only 1.2 percent of children in this age group had lead levels above the threshold. EPA could declare victory on lead and maintain the current NAAQS but instead chose to lower the standard below naturally occurring background levels in most areas.

Dioxin

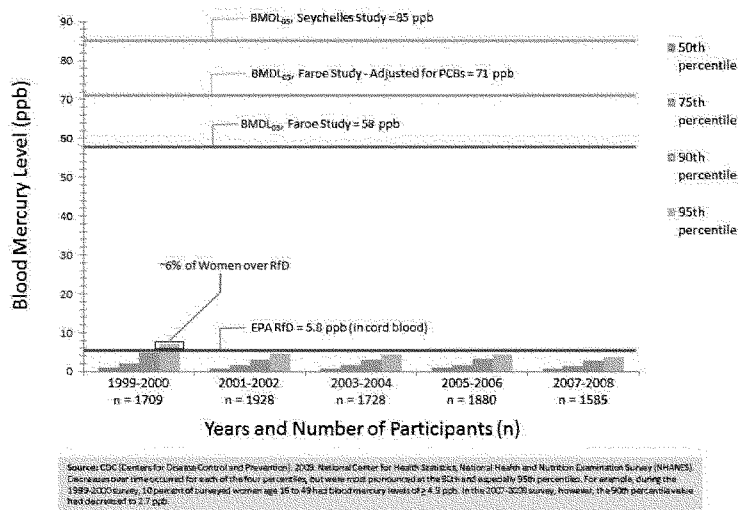
A family of naturally occurring and man-made chemical compounds of widely varying degrees of toxicity, dioxin levels in the air, water, and human tissue have sharply fallen. According to EPA's measure of "toxic equivalents" (TEQ), dioxin declined 92 percent over the last twenty years. Two international studies have found that the level of dioxin in human tissue has fallen 90 percent since 1970.⁶

Mercury

Airborne emissions of mercury in the U.S. also have declined by approximately 60-70 percent and account for less than two percent of a global deposition affecting ambient levels in the U.S. Empirical data shows a strong positive trend. Control measures to reduce the criteria pollutants also work to reduce mercury. As such, it remains debatable whether stringent regulation of mercury per se is justified.

The graph below shows that the CDC's most recent survey finds the blood levels of young women are well below the level at which EPA has set the risk to mercury exposure—an extremely conservative level that is two-three times stricter than that set by the World Health Organization and the Food and Drug Administration.

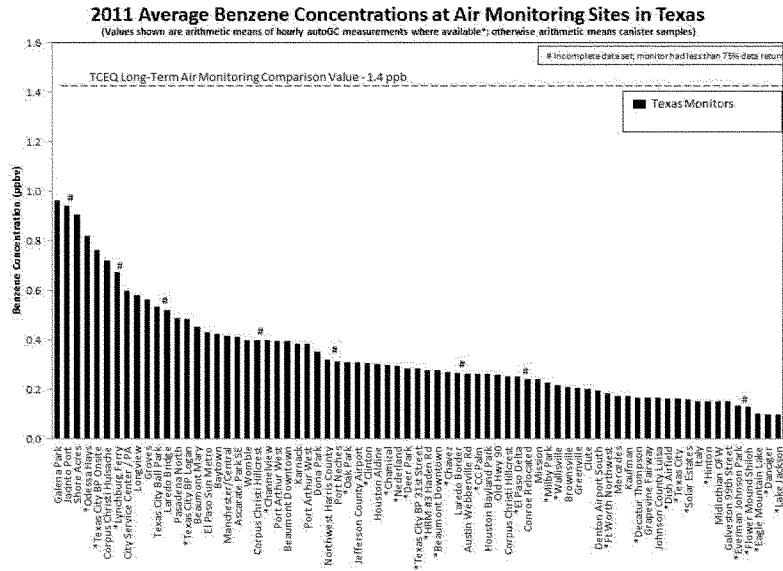
**Comparison of Blood Mercury Concentrations in Women to
Levels Associated with Health Effects and the EPA RfD
(US Women Aged 16-49)**



Nonetheless the EPA has adopted a rule (Utility MACT) mandating massive reduction of mercury emissions from power plants. The rule imposes limits so aggressive that they are infeasible for many plants, many of which have already announced closure. And while EPA admits that the cost of this regulation—at the EPA estimate of \$10 billion per year—is perhaps the most expensive air regulation to date, EPA also admits that the benefits from mercury reduction are so minute to be immeasurable.

Benzene

A well-known carcinogen and the most wide-spread HAP, benzene levels have significantly declined by more than 64 percent as a national average. As the graph below shows, benzene levels in the petrochemical center of the U.S.—the Houston region—have declined as much as 80 percent. Through a partnership with industry and the state environmental agency, Texas has implemented perhaps the most concentrated monitoring system for air toxics anywhere in the world. EPA's few monitoring sites, on the other hand, limit the reliability of estimating national average ambient emissions of hazardous air pollutants and preclude identification of hot spots—localized areas with higher ambient levels of HAPs.



Water Quality

Drinking Water

The quality of drinking water is of the utmost importance to human health. The U.S. now provides highly safe drinking water. EPA regulates public water systems under highly strict limits for hundreds of contaminants. In 2008, 94 percent of the water systems that provide drinking water met all of EPA's highly protective standards. In 1993, only 79 percent of water system met all EPA standards. In 2001, EPA adopted highly controversial standards to mandate reduction of minute levels of naturally occurring arsenic and radio-nucleides. Approximately 2 percent of the nation's water systems cannot yet attain these standards which often necessitate securing an entirely different water source, sometimes at a prohibitive cost.

Public Health

Life expectancy—the most important measure of public health—has increased by at least 40 percent over the last century. According to the Center for Disease Control (CDC), average life expectancy in 1900 was 49.2 years and in 2010, life expectancy increased to 78.7 years.⁷ Medical science and disease

prevention have dramatically reduced disabling and fatal diseases. As the table below shows over the period 1960-2009, the trends in leading causes of chronic disease and death show tremendous progress, with 69 percent decline in heart disease and 78 percent decline in stroke.

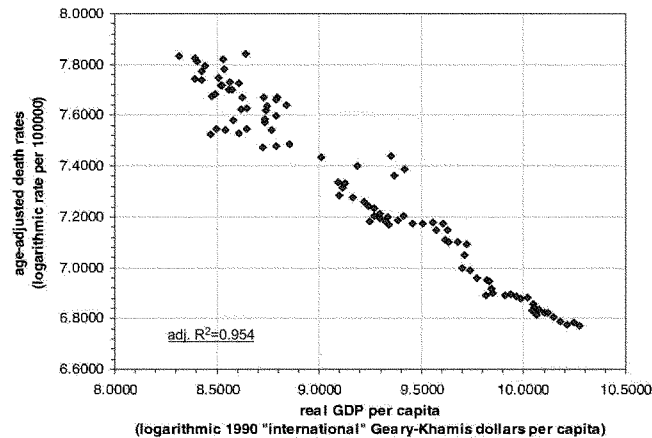
Trends in the Leading Causes of Deaths --- United States, 1960 and 2009

Cause	Deaths, 1960	Deaths, 2009	% Change	Rate of Change*	Rate, 2009
All causes	1,989,000	1,387,000	-30%	-0.0015	1,387,000
Heart disease	589,000	190,000	-68%	-0.0011	190,000
Cancer	578,000	745,000	+29%	+0.0005	745,000
Stroke	370,000	82,000	-78%	-0.0005	82,000
Chronic obstructive pulmonary disease	141,000	159,000	+13%	+0.0001	159,000
Alcohol-related liver disease	138,000	138,000	0%	0.0000	138,000
Accidents	105,000	105,000	0%	0.0000	105,000
Diabetes	82,000	117,000	+43%	+0.0002	117,000
Respiratory	113,000	117,000	+4%	+0.0000	117,000
Alzheimer's	54,000	117,000	+115%	+0.0003	117,000
Total	1,989,000	1,387,000	-30%	-0.0015	1,387,000

The 14 percent uptake in chronic obstructive pulmonary disease (noted in footnote to the Table above) is exceptional and often used to blame air pollution is the cause. But could this occur while air pollution was on the sharp decline? There many confounding factors in the studies. While the incidence of asthma has increased, this occurred over the period of the most dramatic reduction of the criteria pollutants in the forty year history of the CAA. And some studies show a higher incidence of asthma and other chronic respiratory disease in the winter months when ozone and PM is far, far below the levels of summer months.

Over the last five years, EPA's regulatory initiatives have been pre-occupied with PM 2.5 as if it was a source of major risk of premature mortality. Yet, the weak epidemiological studies on which EPA typically relies are incapable of evaluating whether and to what extent outdoor concentrations of PM 2.5 may causally impact cardiopulmonary function. The majority of toxicological studies on the matter strongly suggest that current ambient PM 2.5 is too low to cause major disease or death. According to leading statistician Dr. Ton Cox, "The expectation that lives will be saved by reducing ambient PM 2.5 is not supported by the weight of evidence, although other bases for regulating PM may be justifiable.

Health Effects of Poverty and Unemployment



Source: Brenner MH Int., J. Epidemiol. (2005) 34: 1214-1221.

Far more studies find far stronger correlation between unemployment/low income and premature mortality than the minute correlations EPA identifies in cherry-picked epidemiological studies to assume that current ambient air quality "causes" "early deaths."

Evaluating Progress

Other than the partial data in EPA's "Our Nation's Air: Status and Trends," the limited Toxic Release Inventory, the similarly limited and now dated National Water Quality Inventory (NWQI), the new Wadeable Streams Assessment (WSA), and anecdotal data, the EPA lacks a reliable, consistent, systematic, scientifically meaningful, and publically accessible means of measuring environmental conditions over time.

Regulatory Effectiveness

Equally important, EPA, like most federal regulatory agencies, lacks a methodology for credibly assessing regulatory effectiveness. Agencies continually add to the regulatory edifice but they rarely try to determine whether a regulation achieved its regulatory objective (e.g. reduction of X pollutant by X degrees) and policy objective (e.g. reduction of X degree in risk of adverse health effect).

Federal agencies like EPA are awash in data points, but they overwhelmingly relate to administrative outputs (number of fines, permits, rules, etc.) and not to measurable outcomes. Programs to measure and track regulatory outcomes at EPA were initiated several years ago, but not long after they were

shelved. Various methodologies to measure and track regulatory effectiveness exist and could be legislatively required.

Cost-Benefit Analysis

Regulatory impact analysis, such as cost-benefit analyses (conducted at the stage of rule promulgation) should provide a rubric to assess the importance of the policy objective of a regulation. EPA's current method of cost-benefit analysis is so manipulated, however, that it lacks credibility and grossly misleads the public.

I submit with my written testimony my paper on EPA's 2011 study titled "Benefits and Costs of the Clean Air Act, 1990-2020." My study is entitled "EPA's Pretense of Science: Regulating Phantom Risks."⁸ The EPA study should provide critical information about air quality progress. Built on implausible assumptions, weak and selective science, statistical manipulation, and pure policy choice, however, this study is worse than meaningless. Concluding that CAA regulation will provide \$30 dollars in health benefits for every \$1 in cost and will "save" 230,000 lives, this "Benefits Study" deceives the public about health risks and regulatory costs.

Monitors Trump Models

After forty years of continually increasing regulation, meaningful indicators of environmental trends, conditions, and relative risks must be rooted in empirical data and thus the more robust sciences such as toxicology and medicine. Models used to characterize current or future conditions are useful in many areas, but as a basis of regulatory decision: monitors trump models. Physical measurement of environmental condition in real-time and over-time is a critical tool. The technology now exists to measure the conditions. Ambient air quality monitors, continuous emission monitors (CEMS), representative air sampling, infrared cameras, auto gas chronometers, and many other technologies enable far more precise measurement than EPA's excessive use of models driven by assumptions of unrealistic worst case scenarios.

One of the two grounds for the rare, complete vacature of the Cross State Air Pollution Rule (CSAPR) by the DC Circuit Court of Appeals indirectly involved EPA's speculative models about interstate transport of emissions. EPA formulated these models to calculate the amount of emission reduction in an upwind state necessary to avoid impact on a downwind state—usually already in attainment of the NAAQS in question! The court found that CSAPR as adopted mandated emission reductions in upwind states of a magnitude far disproportionate to their impact on air quality in the downwind state. EPA had relied on its flawed, worst-case modeling of future conditions to justify the amount of reductions imposed on the upwind state.

A major reason for the air quality success enjoyed in Texas is the state's investment in what is likely the most intensive and extensive ambient air quality monitoring system, especially in the Houston region. Precise, localized data is essential to effective, targeted, location-specific air and water quality management.

With the rapid expansion of natural gas production in the Barnett Shale area surrounding the highly populous Dallas-Forth area, many residents were concerned about environmental impacts. The state's initial models of the impact showed considerable impact. But after developing elaborate monitoring protocols and deploying monitors, the Texas Commission on Environmental Quality (TCEQ) found that the drilling had no adverse impact on air quality.

More Vigorous Science of Health Effects

Any measurement of environmental condition and trend is intertwined with EPA's risk assessments or Integrated Science Assessments (ISA). Over the forty years of implementation of federal environmental laws enacted to protect human health, a wide body of diverse environmental science exists. Some scientific disciplines provide more robust, empirical findings. For example, ecological epidemiological studies can only detect correlations or concurrences between pollutant levels and health effects. They cannot establish causation—that pollutant level X caused health effect Y.

Toxicology, medical science, and clinical trials can establish causation and incorporate critical information such as dose, representative exposure, and plausible biological mechanism. After the magnitude of environmental improvement, particularly in air quality, EPA must now ground its risk assessment for health effects (Integrated Science Assessment) in the more vigorous empirical sciences. Epidemiological studies may be useful but alone are no longer sufficient to support regulation of the remaining environmental risks to human health.

Priorities

Abandon the No Safe Threshold Methodology

The single most important priority for effective, cost-efficient, beneficial EPA regulation is reform of the methodologies that EPA is now using to conduct risk assessment of human health effects—the foundation of EPA's regulatory decision. Numerous scientific bodies including the National Academy of Science have called attention to this problem.

After the great gains in air quality and ever-stricter air quality standards now approaching natural background levels in some areas, EPA has devised a methodology to create a vast reservoir of new health risks—and thus a supposedly scientific justification for more stringent new regulation. In the last four years, EPA has used these newly created health risks to justify its unprecedented regulatory agenda. Since 2009, EPA has been using the pure assumption (by data-free extrapolation) that there is no safe threshold of pollution—however low—“below which health risk reductions are not achieved by [regulation-caused] reduced exposure.”⁹ This is Assistant Administrator for Air Gina McCarthy's response to Chairman Upton's letter questioning the credibility of no safe threshold methodology.

Apparently beginning in 2009, EPA's use of this NST methodology increased health risks which EPA identified by four-fold. This increased the number of alleged “deaths” attributable to PM_{2.5} from 88,000 to 320,000. By using NST methodology, EPA found that over two-thirds of the public's health risk from

PM 2.5 comes from ambient levels not only far below the protective NAAQS but even well below the lowest modeled levels in the studies.¹⁰

EPA claims that scientific studies “have not observed a level below which premature mortality effects do not occur.” But this is not a scientific conclusion; it is a policy choice. The EPA’s defense of this absurdly precautionary assumption is another way of saying the point at which all risk is zero cannot be proven. If this NST assumption was expunged from EPA’s cost-benefit analyses of regulation promulgated over the last four years, the estimated costs of EPA’s many new rules would dwarf the estimated benefits.

Focus on the HAPS and Toxics

For forty years, EPA has spent most of its resources on the six criteria pollutants and not the many hazardous pollutants listed in the 1990 amendments of the CAA. Now that most of the country attains even the continually stricter NAAQS, it is time to focus more study on potential risks from HAPS. These are typically far more localized issues best identified and addressed by state and local authorities.

¹ “Jackson Gets Real,” *Politico Morning Energy* (Oct. 24, 2011).

² United States Environmental Protection Agency, “Our Nation’s Air – Status and Trends Through 2010” (Feb 2012).

³ Yale Center for Environmental Law & Policy, “[Environmental Performance Index](#)” (Feb. 2012); Terry Miller, Kim R. Holmes, and Edwin J. Feulner, *2012 Index of Economic Freedom* (Washington, DC: The Heritage Foundation and Dow Jones & Company, Inc., 2012), p. 155.

⁴ Stephen F. Hayward, *2011 Almanac of Environmental Trends* (San Francisco, CA: Pacific Research Institute, 2011), p. 65.

⁵ *Ibid.* at p. 68-69.

⁶ *Ibid.* at p. 264.

⁷ Centers for Disease Control and Prevention, “[Life Expectancy](#)” (Jan. 2013).

⁸ Kathleen Hartnett White, “[EPA’s Pretense of Science: Regulating Phantom Risk](#),” *Texas Public Policy Foundation* (May 2012).

⁹ Gina McCarthy, Assistant Administrator, Environmental Protection Agency, to Rep. Fred Upton (3 Feb. 2012).

¹⁰ Anne Smith, Ph.D., “An Evaluation of the PM 2.5 Health Benefits Estimates for Regulatory Impact Analysis of Recent Air Regulations,” NERA (Dec. 2011); Louis Anthony Cox, Jr., “Reassessing the Human Health Benefits from Clean Air,” *Risk Analysis* (Nov. 2011).

KATHLEEN HARTNETT WHITE

Kathleen Hartnett White is the Distinguished Senior Fellow in Residence and the Director of the Armstrong Center for Energy and the Environment (CEE) at the Texas Public Policy Foundation. Kathleen directs the CEE's research and policy development on a range of issues including energy, climate change, air quality, water quality & water rights and waste.

In August 2007, Kathleen White completed her six-year term as Chairman and Commissioner of the Texas Commission on Environmental Quality (TCEQ). With regulatory jurisdiction over air quality, water quality, water rights & water utilities and waste, TCEQ is the second largest environmental agency in the world after U.S. EPA. As the final state decision maker, she presided over complex and controversial permitting issues such as coal-fired power plants, ozone controls for Houston's petrochemical complex, climate change, water right permits and radioactive waste disposal.

Prior to Governor Rick Perry's appointment of Kathleen Hartnett White to TCEQ in 2001, she served on the Texas Water Development Board, the Texas Economic Development Commission and the Environmental Flows Study Commission. Kathleen now is an officer and a director of the Lower Colorado River Authority - her fifth gubernatorial appointment.

She has received the Texas Water Conservation Association's President's Award, the Colorado River Foundation's Friend of the River Award and the Texas Chemical Council's Leadership Award. Her writing has been published in the National Review, Investors' Business Daily, Washington Examiner, Daily Caller, Weekly Standard and many state newspapers.

A writer and consultant on environmental laws, natural resource policy, private property rights and ranching history, White received her bachelor cum laude and master degrees from Stanford University where she held the E. W. Lyman Academic Scholarship. Her many academic awards include a national Danforth National Fellowship for doctoral work at Princeton University, Princeton's Jonathan Edwards Award for Academic Excellence, and a Lineberry Foundation Fellowship at Texas Tech University School of law.

White is also a partner with her husband in a 125 year-old ranching operation in Jeff Davis and Presidio counties, Texas.

Chairman HARRIS. Thank you very much.
We will now hear from Mr. Trzupek.

**STATEMENT OF MR. RICHARD TRZUPEK,
PRINCIPAL CONSULTANT, TRINITY CONSULTING**

Mr. TRZUPEK. Thank you, Chairman Harris, Ranking Member Bonamici, Chairman Smith and other Members of the Committee for the opportunity to testify here today. I would also like to thank you on behalf of two other groups. One is, as Chairman Harris noted, the small to mid-sized businesses that I represent. They were very excited to hear that you were having me back. They feel like they have been given a voice through me and hopefully I will be worthy of that voice. The other person I am thanking you on behalf of is my wife, who will benefit from a very nice dinner this weekend because I am missing Valentine's Day, so thank you for her.

I would like to begin by sharing a personal recollection of the state of the environment in the United States over 40 years ago. I grew up in the 1960s in the far southeast side of Chicago in the midst of the booming steel industry that provided my father with employment. The term "pollution control" in those days was not yet part of the lexicon. The skies on the south side glowed a bright orange at night and a fine layer of dust that collected on my father's car each morning offered new testimony to the tons of pollutants being expelled into the air. The water was little better. As children, we were warned the dire, potentially deadly consequences of swimming in the foul waters of the Calumet River that effectively served as an industrial sewer.

Those days are long behind us, and, like those of you who remember them, I am pleased to say good riddance. Thanks to a lot of hard work and the expenditure of a lot of wealth, we have done what some back in those bad old days assured us could not be done. We have restored the air, water and soil of America to a condition of which we can all be proud.

If the America of the 1960s was analogous to the worst messy teenager's room imaginable, in the America we live in today, we find that the old pizza boxes have been tossed, the floor scrubbed, the bathroom scoured and the furniture disinfected, and there is even a little hit of lemon wafting through the air. In the America we live in today, it would take a stereotypical severe English butler carefully tracing the tops of dresser drawers with fingers clad in white cotton gloves to find a problem.

And to the extent that we choose to address environmental issues, we should recognize that the EPA, according to EPA's own data, industry, in most cases, is a minor contributor these days to emissions of pollutants of concern. We thus have a choice today: either to recognize and maintain the progress that we have made while recognizing that doing so means we can scale back our efforts to a more reasonable, appropriate level commensurate with today's reality or to spend increasing amounts of wealth and effort for ever-diminishing returns in search of an unachievable, utopian environmental purity instead of practicing reasonable environmental stewardship in the tradition of John Muir and Theodore Roosevelt.

EPA's own data chronicles the remarkable progress we have made. I have shared some of this in my written testimony. Any sober, scientific examination of the data clearly demonstrates that contrary to popular misconception, America has and will continue to make massive reduction in the amount of pollutants that we release into the air, water and soil. I would like to point out that those reductions include reductions in nationwide greenhouse gas emissions. We are now down to 1997 levels of greenhouse gas emissions according to the last complete EPA inventory.

The implementation of renewable portfolio standards in over 30 states, coal fleet retirements, the increased use of natural gas to generate power, and new CAFE standards will ensure that this trend continues. However one feels about global warming, the fact is that America is and will continue to do exactly what those concerned about AGW want us to do.

When I say we are at a crossroads, I believe that many of those that are invested in the idea that today's environmental crisis is as bad as it was 40 years would agree but they view the available path somewhat differently. They would have us believe that we can only choose between two extremes: if you don't support every new environmental initiative and every EPA program, then, according to the prophets of doom, you therefore support a return to the bad old days of unlimited, unrestrained ecological damage, or to put in terms of Neil Simon's famous play, the Odd Couple, they would have us believe that choosing not to be Felix Unger requires one to be Oscar Madison. There can be no middle ground.

For my part, I believe there is a desirable center that lies somewhere between polluter and puritan. Having accomplished so much, we should not abandon those hard-fought gains but we owe it to the men and women across America who have got us to this point to determine how much more we will require of them and toward what end: for as the working men and women across America, the people I have had the privilege to serve for the last 30 years who have got us here, they are the engineers, the plant managers, the HS professionals who are told they must keep their facilities in compliance while keeping them profitable as well. For many American industries, doing both has been quite the trick and a lot of sweat and toil has been expended accomplishing these two ends. If we are going to ask them to do even more with less and less to show for those efforts, we owe it to them as we owe it to ourselves to demonstrate that these efforts are necessary, not narcissism. Thank you.

[The prepared statement of Mr. Trzupek follows:]

**Committee on Science, Space, & Technology
Environment Subcommittee
United States House of Representatives
"The State of the Environment: Evaluating Progress and Priorities"
Testimony of Richard Trzupek
Principal Consultant
Trinity Consultants, Inc.
Thursday, February 14th, 2013
WRITTEN**

Introduction

Thank you Chairman Harris, Ranking Member Bonamici and other members of the Subcommittee for the opportunity to testify on this important topic. I am Richard Trzupek, a chemist and environmental consultant, currently employed as a Principal Consultant with Trinity Consultants, Inc. I have been employed in the environmental industry for thirty years, initially as a stack tester (measuring air pollution emitted by industrial processes) and then as a consultant to industry. The vast majority of my clients are now, and always have been, small to mid-sized companies that do not have full-time environmental professionals on staff.

I appreciate the opportunity to submit testimony on this important topic, one that is – I believe – vital to the continuing health, welfare and prosperity of our nation. Having made enormous strides in restoring our environment, we have arrived at a crossroads. If we follow one path, the obsessive-compulsive flight toward environmental puritanism (as opposed to prudent conservation) that characterizes today’s environmental movement will affect more and more of the nation. Activists will continue to search for new and necessarily increasingly insignificant risks to protect the populace from, and we will spend increasing amounts of time and energy to mitigate these tiny risks, for less and less return. If we choose the other path, we can balance the need to maintain a healthy, vibrant environment with our equally important obligation to eliminate unfounded fear, fight poverty and to spread prosperity.

Many of those invested in the environmental industry agree that we are at a crossroads, but they view the available paths somewhat differently. They would have us believe that we can only choose between two extremes. If you don’t support new environmental initiatives and every EPA program, then – according to these prophets of doom – you therefore support a return to the bad old days of unlimited, unrestrained ecological damage. Or, to put in terms of the Neil Simon’s famous play “The Odd Couple”, they would have us believe that choosing not to be Felix Unger requires one to be Oscar Madison. There is no middle ground.

This message emanates from all parts of today’s massive environmental industry. This includes not only well-funded, hyper-active environmental organizations like the Sierra Club and National Resources Defense Council, but a host of people in academia and industry who have a vested

interest in maintaining what the late Michael Crichton so accurately described as our national “State of Fear”. It includes academic types whose research funding and relevance depends on them discovering, quantifying and publicizing sources of risk. In the blinkered world of academia, the relative magnitude of these risks rarely matters and the idea that risk analysis should necessarily encompass rewards, penalties and unintended consequences that go well beyond the limits of their research seems to be an alien concept.

There is a significant portion of the commercial sector whose profits depend on perpetuating this climate of fear as well. For example, the tap water in the vast majority of American homes is among the cleanest in the world. Our drinking water standards are very stringent, monitoring extremely diligent and the technology that is employed to remove contaminants and to test for them is, with few exceptions, state of the art. None the less, water-purification products have become ubiquitous in the marketplace, taking advantage of the perception – however false – that tap water is dangerous to our health. Claims that this product or that removes 99% of harmful contaminants may or may not be true, but it hardly matters when the concentration of contaminants one starts with are so tiny as to be barely measurable. 99% of nothing is still nothing.

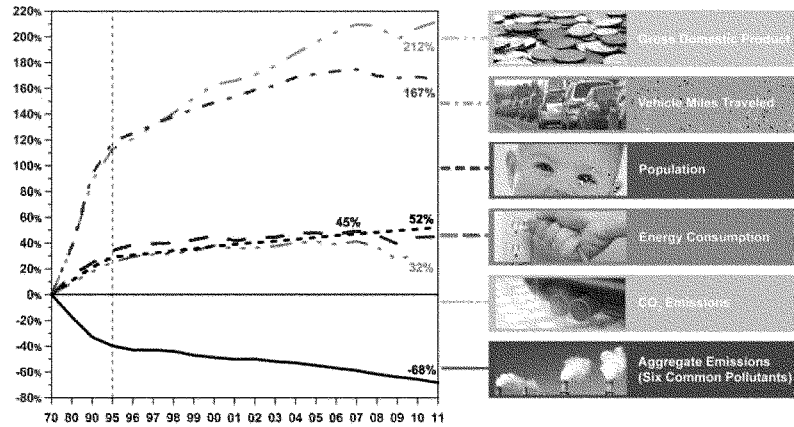
Other companies sell indoor air purifiers in order to prey on the mistaken, but all too common, misconception that America’s air is getting more and more polluted every year. Some of these air purifiers generate ozone, which they promise will remove all sorts of air pollutants. To be sure, ozone does react with a variety of compounds that may or may not be present in the air. The irony of such products however, is that billions upon billions of dollars have been spend over the last forty years in an effort to reduce ozone concentrations in the ambient air of our large cities, only to find that – in the name of “clean air” – we have developed devices that introduce the compound directly into peoples’ homes instead.

The chasm between environmental perception and environmental reality, in other words, is huge and it’s growing larger every day. My testimony primarily focuses on two aspects of environmental policy: 1) the progress America has made in improving and protecting our environment, and 2) an analysis of selected, current environmental issues and initiatives, focusing on societal and economic costs, and ever-diminishing returns for increasingly puritanical and intrusive policies.

Because my career has primarily involved air quality issues, I will examine that portion of the environmental picture in the most depth, in terms of both conventional air pollutants, toxic air pollutants and greenhouse gases. In addition, I will also discuss water quality, wetlands preservation and hydraulic fracturing of shale gas formations as well.

Conventional Air Pollutants

The progress we have made in reducing emissions of the six most common “criteria” air pollutants is both remarkable and undeniable. The following graphic, published by USEPA, illustrates that progress:



A more detailed examination of the underlying data, also published by USEPA, shows that this reduction trend has been consistent in terms of both emissions of the individual air pollutants reduced and the time frame in which the reductions took place. The latter point is important, because a popular misconception is that America has had “pro-environment” and “anti-environment” administrations in power over the last forty years. Clearly, in terms of air pollution at least, this is not the case. Every administration since 1970 has been pro-active in protecting the environment.

Percent Change in Emissions

	1980 vs 2010	1990 vs 2010	2000 vs 2010
Carbon Monoxide (CO)	-71	-60	-44
Lead (Pb)	-97	-60	-33
Nitrogen Oxides (NO _x)	-52	-48	-41
Volatile Organic Compounds (VOC)	-63	-52	-35
Direct PM ₁₀	-63	-67	-50
Direct PM _{2.5}	---	-55	-55
Sulfur Dioxide (SO ₂)	-69	-65	-50

Notes:
 1. --- Trend data not available
 2. Direct PM₁₀ emissions for 1980 are based on data since 1985
 3. Negative numbers indicate reductions in emissions

These emissions reductions have primarily been accomplished by the industrial sector in two ways: 1) by reducing the amount of air pollutants emitted in the industrial sector through the use of add-on controls, changes in work practices, raw material substitutions and other measures, and 2) by designing and producing increasingly cleaner engines and fuels used in the transportation sector of our economy.

These reductions are reflected in the steady improvement in ambient air quality across the nation, as recorded by America's extensive air quality monitoring network:

Percent Change in Air Quality			
	1980 vs 2010	1990 vs 2010	2000 vs 2010
Carbon Monoxide (CO)	-82	-73	-54
Ozone (O ₃) (8-hr)	-28	-17	-11
Lead (Pb)	-90	-83	-62
Nitrogen Dioxide (NO ₂) (annual)	-52	-45	-38
PM ₁₀ (24-hr)	---	-38	-29
PM _{2.5} (annual)	---	---	-27
PM _{2.5} (24-hr)	---	---	-29
Sulfur Dioxide (SO ₂) (24-hr)	-76	-68	-48
Notes:			
1. --- Trend data not available			
2. Negative numbers indicate improvements in air quality			

Given this spectacular record of success, I am constantly amazed by the number of Americans who are unaware of the progress we have made in cleaning up the air. As I have interacted with everyday citizens in the course of public hearings for new projects and during speaking engagements, a surprising number of people – a large majority in fact – seem genuinely surprised to learn of these facts. In some cases, more stubborn individuals flatly refuse to believe them.

Clearly, no one expects the average American to be an expert in finding and evaluating air quality data. This all-too-common impression that the United States is a dangerously polluted nation and is becoming more so must, therefore, be attributable to some other source or source(s). It is my impression that these false-impressions are primarily created by what I think of as America's large and ever-growing risk industry, and these messages are then further perpetuated by individuals in the media and bloggers who have only the vaguest understanding of the underlying principals and issues. Unfortunately, the USEPA has become part of this disinformation machine, especially in the course of the last four years.

By way of example, consider USEPA's recently finalized "Boiler MACT" rule. This regulation primarily affects larger industrial (as opposed to utility) boilers that burn solid and/or liquid fuels. One of the positive aspects of this rule trumpeted by the Agency, environmental groups and media outlets is a reduction in "fine particulate" emissions (also known as PM-2.5

emissions) of 18,000 tons per year. Fine particulate matter has been linked to respiratory illnesses such as asthma.

If research data shows that fine particulate matter contributes to respiratory illnesses, it follows that a reduction in fine particulate matter emissions will result in a decrease in respiratory illnesses. Taking this another step further, the EPA then puts a price tag on avoided respiratory illnesses (and other illnesses) that will result from Boiler MACT implementation, claiming that while achieving these emissions reductions will cost industry \$2.2 to \$2.4 billion, the net national monetary benefit will come in somewhere around \$13 to \$29 per dollar invested.

We'll touch on this rather dubious accounting in a moment, but let's first focus on the real magnitude of this emissions reduction. To the untutored, a reduction of 18,000 tons of anything per year seems significant, but what does that number really mean in terms of the real world? To find the answer, we again turn to EPA data, which summarizes the amount of fine particulate emissions from various types of sources.

Source Type	Emissions (tons/year)	Percentage of All Emissions
Electric Utility Fuel Combustion.	308,738	5.04%
Industrial Fuel Combustion	147,494	2.41%
Other Fuel Combustion	369,590	6.04%
Chemical & allied product mfg	20,678	0.34%
Metals processing	63,484	1.04%
Petroleum & related industries	23,126	0.38%
Other industrial processes	350,472	5.72%
Solvent utilization	3,551	0.06%
Storage & transport	22,067	0.36%
Waste disposal & recycling	205,004	3.35%
Highway vehicles	295,373	4.82%
Off-highway	301,179	4.92%
Miscellaneous	4,012,455	65.53%
TOTAL:	6,123,211	100.00%

Looking at this table, it's clear that today's industrial sources are relatively small contributors to fine particulate emissions. Miscellaneous – a catch-all for all non-industrial, non-transportation sources (e.g.: consumer products, natural sources, etc). is the largest contributor by far. This is largely due to the fact that industrial and transportation sources have – as we have seen – made such massive reductions in emissions over the past four decades.

The 18,000 ton per year reduction in fine particulate emissions from industrial boilers represents a 0.3% reduction in overall national fine particulate emissions of over 6 million tons per year. Is this a significant reduction? In my view it's not, but whether or not one agrees, doesn't a supposedly disinterested agency in the public service like the USEPA have an obligation to

present this part of the picture as well, rather than steering us toward numbers with lots of zeros that mean nothing in a vacuum from a scientific point-of-view? Should not the Agency help put to rest the tired, old myth that it is industry – and industry alone – that is responsible for whatever contaminants find their way into the environment?

Let's return to those monetary benefit claims. Using the low end of the numbers presented by USEPA, a \$2.2 billion investment will result in a \$28.6 billion return. What a terrific result. But why stop there? If controlling a mere 18,000 tons per year of fine particulate matter can result in the generation of \$26.4 billion in net income, what would happen if we controlled all 6.1 million tons per year of fine particulate matter? Using USEPA's minimum cost effectiveness approach, we find that applying the same rate of return would generate \$8.9 trillion per year in net revenue. We have thus solved America's debt crisis. All we need to do is build a dome over the nation to keep every bit of fine particulate out and we'll clear the national debt in two years.

USEPA also claims that Boiler MACT implementation will result in the avoidance of 8,100 premature deaths per year. If we extend that peculiar logic, we find that control of all 6.1 million tons of fine particulate will avoid over 27 million premature deaths per year. The road to immortality apparently awaits.

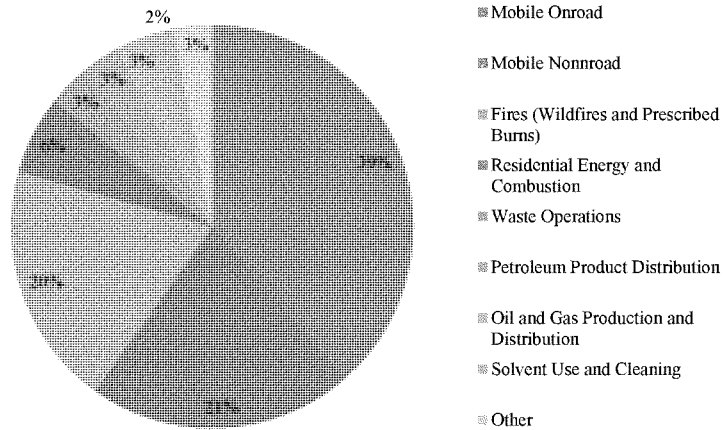
Obviously, these absurd conclusions cannot hold up to any scientific scrutiny. They are presented as one way to illustrate the way in which EPA's regulatory analyses and justifications don't make sense in any real world context. Absurd assumptions must necessarily result in absurd conclusions.

The fact is that industrial sources of air pollution have been so successful in cleaning up their act that they represent less than half – and in some cases much less than half – of United States emissions of all of the criteria air pollutants, except for sulfur dioxide. Sources of criteria air pollutant sources, based on the latest USEPA National Emissions Inventory, are summarized in Appendix A, attached.

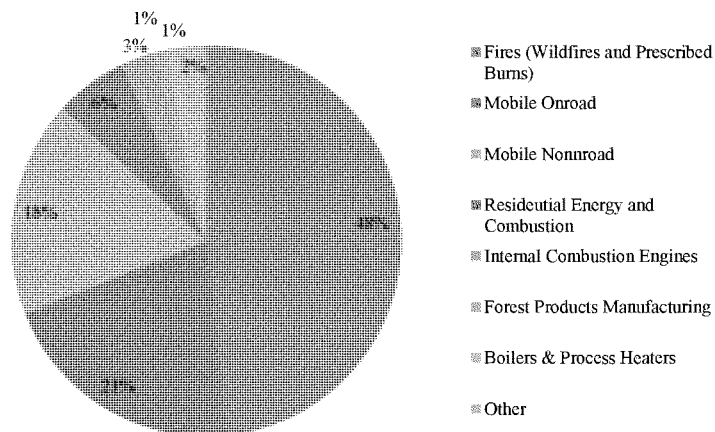
The same themes hold true with respect to emissions of so-called "toxic air pollutants" (also known as "Hazardous Air Pollutants" or "HAPs"). The industrial contribution to the very, very small concentrations of HAPs present in the nation's ambient air is not very significant in most cases, yet industrial sources are those most often vilified and targeted when toxic air pollutants are mentioned. Consider, for example, USEPA data identifying the sources of two readily recognizable air toxics: formaldehyde and benzene, both of which are on the USEPA's list of regulated HAPs.

The following two pie charts, showing the sources that contribute to ambient concentrations of formaldehyde and HAPs are taken from USEPA's 2005 National Air Toxics Assessment. Released in 2011, this is the most recent National Air Toxic Assessment available. The data shows that the vast majority of emissions of these two pollutants emanates from natural sources (fires) and from transportation sources.

2005 NATA Benzene Emissions Percent Contribution By Sector



2005 NATA Formaldehyde Emissions Percent Contribution By Sector



America has spent a great deal of money and effort to reduce air toxics emissions, even though the average American is not exposed to dangerous concentrations of these compounds. The two examples referenced above are representative of the relative contributions of different sources for a great many air toxics. We simply do not have an air toxics problem in the United States today and, to the extent that anyone is unduly concerned by the small amounts of air toxics that exist in the atmosphere, industry should not continue to be the primary target of USEPA and environmental advocacy groups.

Greenhouse Gases

I would describe myself as a “global warming skeptic”, although I find those three words a gross oversimplification of a complex position. Like many other scientists, I believe that planet Earth has been going through a moderate warming cycle over the past few decades, one that appears to be leveling off. I also believe that human activities have made a contribution to that warming cycle, but I do not believe that the magnitude of that contribution is especially significant nor does it justify the imposition of expensive mitigation measures that would certainly have the most negative effects on the poorest segments of our global society.

Having said that, I must admit that those who believe that both the recent warming trend and mankind’s contribution to it – sometimes designated “global warming alarmists” – have won the day, in the United States at least. We have made and will continue to make massive reductions in greenhouse gas emissions rates in the United States. I marvel that nobody in the EPA or in the employ of the big environmental advocacy groups will acknowledge – much less celebrate – that simple truth. Instead prominent alarmists like former Vice President Al Gore continue to call for action as if completely unaware of all of the changes that have taken place and will continue to take place.

According to USEPA data, emissions of GHG’s in 2010 (the last year for which a complete GHG inventory has been published) were down to levels that have not been seen since 1997. While America’s recent economic woes are surely in part responsible for this decrease, so has the continued implementation of Renewable Portfolio Standards (RPS) programs in over thirty individual states. When RPS implementation is combined with mass retirement of older, less-efficient coal-fired power plants and their replacement by less-carbon intensive natural gas fired power plants, it is clear that GHG emission rates in the United States will continue to drop.

Water Quality

Assessing the magnitude of the improvements in water quality that have been realized over the last forty years is a more difficult task than quantifying improvements in air quality. This is primarily because there are so many metrics for assessing water quality and the way that a particular water resource is used will factor into the evaluation as well. “Stream A”, used for recreational purposes, may be deemed to be healthy even though it contains the same amount of the same contaminants as “Stream B”, which supplies drinking water to neighboring communities.

I do not mean to criticize this aspect of EPA's water quality assessment effort. It seems reasonable and proper to factor in type(s) of usage when applying water quality standards. Doing so, however, makes it very difficult to clearly define the magnitude of improvement in United States water quality since the passage of the Clean Water Act. This is further complicated by the fact that water quality standards – just like air quality standards – have been repeatedly tightened over the years.

However, there is little doubt that America has made great strides in improving the nation's water quality. Rivers no longer catch on fire. Lakes once thought dead are sportsman's paradises. The water quality "problems" we worry about today are issues that Americans in 1970 would have traded a limb to have, instead of dealing with the real ecological disasters of the time.

Wetlands Preservation

Since 1988, when the policy was first introduced by President George H.W. Bush, every administration has followed a "no net loss of wetlands" policy. This policy has been a huge success. With the exception of Gulf Coast tidal wetlands (as special case) wetlands in the United States have increased in acreage and improved in terms of quality.

Many people, including myself, believe that wetlands program could stand with some improvements. At times, those who administer the program at the Army Corps of Engineers and in the EPA make petty determinations that are almost laughable. I have seen a pair of tires declared a wetland, for example and it several months of effort to get that ruling reversed. Arbitrary wetlands determinations have come into conflict with individual property rights as well.

Yet, for all its flaws, the wetland policy articulated by the first President Bush remains another American, environmental success story.

Hydraulic Fracturing

Hydraulic fracturing of deep shale formations in order to collect natural gas, natural gas liquids and crude oil is not, as critics would have it, new, poorly understood technology. Hydraulic fracturing, also known by its slang name of "fracking", has been around for over fifty years. The increased use of fracking in recent years is the result of two technological advances: 1) development of horizontal drilling techniques that allow for the economical recover of hydrocarbons in relatively shallow deep shale formations, and 2) new sensing techniques that allow energy companies to vastly improve their success rates when searching for energy deposits. Critics of the technique claim that the chemicals used in fracking are dangerous and could lead to contamination of aquifers. These are false, scientifically unsound conclusions.

When a hole is drilled deep underground, for any purpose, it necessarily must pass through shallow aquifers, if such aquifers are present. The depth of aquifers used for drinking water vary, but 50 to 200 feet is typical in the United States. When the hole passes through the aquifer, an impermeable casing must be used to ensure that the materials used in drilling do not contaminate

the aquifer. Again, this is the case whenever one drills deep, for any purpose. This would be the case, for example, if Carbon Storage and Sequestration ever becomes a viable way of controlling carbon dioxide emissions.

Drilling also requires the use of very small concentrations of certain chemicals, such as corrosion inhibitors (to prevent metal oxidation) and anti-bacterials (to prevent biological growth and fouling). This has and will continue to be the case of any kind of deep well drilling. So, if a casing is poorly constructed, there is a chance that a small amount of certain, well-understood chemicals could seep out into an aquifer. That risk – tiny as it may be – will always exist as long as man uses drills to explore the earth and extract its resources. However, if the casing is properly installed, there is no way for any material used to extract shale gas lying a mile below the surface to seep into aquifers lying a couple of hundred feet down.

The shale gas revolution is an American success story. A decade ago we were listening to dire predictions of natural gas shortages and the need to build LNG import terminals. Today, natural gas is abundant and cheap. Rather than talking about imports, American energy companies are preparing to export this valuable commodity overseas. This revolution has taken place safely and responsibly. It's a revolution of which we should all be proud.

Summary

In my opinion, we have reached a point of diminishing returns such that we need to reassess the wisdom of continuing investment in environmental programs and regulation at the same rate that we have over the last forty-some years. In addition to the fact that America is now effectively controlling, minimizing and otherwise reducing the majority of pollutant emissions into the air, water and soil that had been largely uncontrolled in the run-up to modern environmental regulatory activity, the cost to further control, minimize and otherwise reduce the residual emissions that remain is disproportionately high.

For example, all large industrial sources of particulate emissions in the United States are controlled. The days of smokestacks belching black soot are well behind us (which leads media outlets and environmental groups to publish pictures of smokestacks emitting steam as a way of visualizing "air pollution"). The vast majority of these large industrial sources use one of two well-established, reliable technologies to control particulate emissions: fabric filters (aka: baghouses) and electrostatic precipitators (ESP). Each of these technologies typically removes 99% + of particulate matter introduced into it. Controlling more than we control now would require either adding more ESPs and/or baghouses, or replacing these units with more exotic and expensive technologies. However, by definition, that additional expenditure would be much less cost effective. Generally speaking, if controlling the first 99% costs "X dollars/ton", then controlling 99% of the remaining 1% will cost 10X dollars/ton, and controlling 99% of that residual will cost 100X dollars/ton, etc.

If the EPA is going to remain relevant and most importantly – from its point of view - fully-funded, then it has felt the need to continually redefine its mission as environmental progress has

accumulated. In the past, under administrations of both parties, this redefinition has consisted primarily of adopting increasingly more stringent standards for the air and the water. As long as the EPA has the ability and the authority to decide what the word “clean” means, it can ensure that the air and our waterways are eternally, officially “dirty”, no matter how much pollution is removed from each.

A portion of the public and our elected representatives have caught on to the continual rolling back of the goal posts that is so central to current environmental policy-making. While it's unlikely that enough people have become aware of this practice so as to endanger EPA funding, or that of the big environmental groups, any type of increased scrutiny is troubling to those invested in the risk industry. A new tactic was needed to justify ever more environmental purity in a pristine nation.

The answer – the coming trend – is the equivalent of searching for needles in the midst of otherwise inoffensive haystacks. The EPA is moving from looking at the environment in the macroscopic sense to a new paradigm in which they put every single bit of the environment under a microscope. Doing so will accomplish a couple of things that will make both the Agency and environmental groups quite happy. It will certainly create a bevy of work in its own right. When you move from a model where the EPA uses representative sampling to assess environmental quality to one in which you search for individual hot spots, you create a massive amount of work. It's the difference between conducting an opinion poll utilizing a statistically significant portion of the population and soliciting the opinion of every single citizen.

In addition to the work that the search itself creates, it's inevitable that this kind of intensive examination will yield fruitful results. When one puts anything under a microscope, one necessarily will find something ugly to gawk at. A magnifying device not only makes things look bigger, it also makes them seem more important than they really are.

How will this new mission play out in practical terms over the next four years? Let's consider one example. At a recent meeting of the Air and Waste Management Association, the new Director for Air and Radiation in EPA Region V, George Czerniak, proudly announced some new initiatives that would begin in 2013. One of these involve a new term: occult emissions. It's an apt name, since finding them will involve many a witch hunt.

According to the EPA, occult emissions are air pollution emissions that may (or may not) leak out of building from something other than the traditional smokestack. Let's say that you operate a printing plant, for example. The solvents in the printing ink will be collected in a dryer, directed to a control device and destroyed very efficiently, thus preventing the solvents from contributing to smog formation. All of this happens according to applicable regulations and will be documented in the plant's permit.

But, even though well over 99 per cent of the solvents will be collected and destroyed, might there be a little bit that escapes? Perhaps through a window? Perhaps through a vent on a wall? It's surely possible, even if that kind of tiny, incidental emission isn't going to endanger anyone's health or hurt mother earth in any way. But that's exactly the sort of "occult emissions" that EPA will start searching for in 2013.

Czerniak said that EPA inspectors would be looking for occult emissions with the aid of infrared cameras. These cameras identify sources of heat, not actual air pollution, and it will be easy to find heat escaping here and there is practically any building. No matter. These points will be viewed as potential sources of undocumented emissions and will therefore prompt further investigation.

When the EPA identifies occult emissions that it perceives to be a problem, it will use its Clean Air Act enforcement authority and its general power to prevent "endangerment" of any sort to go after offenders. This too has become a bigger part of the EPA's playbook in recent years. The threat of enforcement is enough to force action (justified or not), particularly when small to mid-sized companies that don't have the resources to conduct protracted fights are involved. If that sounds an awful lot like environmental racketeering to you, well let's just say that you wouldn't be the first one to make that particular observation.

There is, in summary, a big difference between solving problems and searching for problems to solve. As a nation, we have largely solved the environmental crisis that we faced half a century ago. It is time that we acknowledged that remarkable accomplishment and set ourselves upon a new course: one which will prevent us from ever returning to those dirty old days, but which also reflects the simple fact that any slight residual environmental and health risks to be addressed do not deserve the same level of time, attention or treasure as the big problems of yesteryear.

Thank you again for the opportunity to testify before the committee.

Richard Trzupek

Appendix A

Sources of United States Criteria Air Pollutant Emissions

NATIONAL EMISSIONS SUMMARY: CARBON MONOXIDE		
EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	726,782	0.82%
FUEL COMB. INDUSTRIAL	978,076	1.10%
FUEL COMB. OTHER	2,705,352	3.03%
CHEMICAL & ALLIED PRODUCT MFG	185,605	0.21%
METALS PROCESSING	840,076	0.94%
PETROLEUM & RELATED INDUSTRIES	265,226	0.30%
OTHER INDUSTRIAL PROCESSES	425,362	0.48%
SOLVENT UTILIZATION	5,341	0.01%
STORAGE & TRANSPORT	17,829	0.02%
WASTE DISPOSAL & RECYCLING	1,377,598	1.54%
HIGHWAY VEHICLES	36,049,690	40.43%
OFF-HIGHWAY	18,127,567	20.33%
MISCELLANEOUS	20,991,031	23.54%
BIOGENICS	6,474,274	7.26%
TOTAL:	89,169,808	100.00%

Total Industrial: 8.44%
Total Non Industrial: 91.56%

NATIONAL EMISSIONS SUMMARY: AMMONIA		
EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	27,121	0.62%
FUEL COMB. INDUSTRIAL	12,532	0.29%
FUEL COMB. OTHER	63,326	1.45%
CHEMICAL & ALLIED PRODUCT MFG	18,719	0.43%
METALS PROCESSING	1,989	0.05%
PETROLEUM & RELATED INDUSTRIES	1,422	0.03%
OTHER INDUSTRIAL PROCESSES	56,016	1.28%
SOLVENT UTILIZATION	382	0.01%
STORAGE & TRANSPORT	4,959	0.11%
WASTE DISPOSAL & RECYCLING	67,896	1.55%
HIGHWAY VEHICLES	138,684	3.18%
OFF-HIGHWAY	4,040	0.09%
MISCELLANEOUS	3,969,665	90.91%
TOTAL:	4,366,751	100.00%

Total Industrial: 5.82%
Total Non Industrial: 94.18%

NATIONAL EMISSIONS SUMMARY: NITROGEN OXIDES

EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	3,112,839	16.17%
FUEL COMB. INDUSTRIAL	1,470,991	7.64%
FUEL COMB. OTHER	582,456	3.03%
CHEMICAL & ALLIED PRODUCT MFG	54,597	0.28%
METALS PROCESSING	79,209	0.41%
PETROLEUM & RELATED INDUSTRIES	432,367	2.25%
OTHER INDUSTRIAL PROCESSES	412,044	2.14%
SOLVENT UTILIZATION	5,354	0.03%
STORAGE & TRANSPORT	8,661	0.05%
WASTE DISPOSAL & RECYCLING	96,833	0.50%
HIGHWAY VEHICLES	7,134,479	37.07%
OFF-HIGHWAY	4,516,766	23.47%
MISCELLANEOUS	261,640	1.36%
BIOGENICS	1,077,859	5.60%
TOTAL:	19,246,094	100.00%

Total Industrial: 32.50%
Total Non Industrial: 67.50%

NATIONAL EMISSIONS SUMMARY: PM-10		
EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	406,730	1.87%
FUEL COMB. INDUSTRIAL	192,209	0.89%
FUEL COMB. OTHER	377,361	1.74%
CHEMICAL & ALLIED PRODUCT MFG	26,812	0.12%
METALS PROCESSING	81,770	0.38%
PETROLEUM & RELATED INDUSTRIES	30,283	0.14%
OTHER INDUSTRIAL PROCESSES	1,085,840	5.01%
SOLVENT UTILIZATION	4,052	0.02%
STORAGE & TRANSPORT	48,838	0.23%
WASTE DISPOSAL & RECYCLING	239,167	1.10%
HIGHWAY VEHICLES	375,527	1.73%
OFF-HIGHWAY	326,253	1.50%
MISCELLANEOUS	18,497,445	85.27%
TOTAL:	21,692,287	100.00%

Total Industrial: 11.49%
Total Non Industrial: 88.51%

Source: USEPA National Emissions Inventory, 2008

NATIONAL EMISSIONS SUMMARY: PM-2.5		
EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	308,738	5.04%
FUEL COMB. INDUSTRIAL	147,494	2.41%
FUEL COMB. OTHER	369,590	6.04%
CHEMICAL & ALLIED PRODUCT MFG	20,678	0.34%
METALS PROCESSING	63,484	1.04%
PETROLEUM & RELATED INDUSTRIES	23,126	0.38%
OTHER INDUSTRIAL PROCESSES	350,472	5.72%
SOLVENT UTILIZATION	3,551	0.06%
STORAGE & TRANSPORT	22,067	0.36%
WASTE DISPOSAL & RECYCLING	205,004	3.35%
HIGHWAY VEHICLES	295,373	4.82%
OFF-HIGHWAY	301,179	4.92%
MISCELLANEOUS	4,012,455	65.53%
TOTAL:	6,123,211	100.00%

Total Industrial: 24.73%
Total Non Industrial: 75.27%

Source: USEPA National Emissions Inventory, 2008

NATIONAL EMISSIONS SUMMARY: SULFUR DIOXIDE		
EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	7,776,675	71.82%
FUEL COMB. INDUSTRIAL	1,056,343	9.76%
FUEL COMB. OTHER	283,706	2.62%
CHEMICAL & ALLIED PRODUCT MFG	184,667	1.71%
METALS PROCESSING	177,173	1.64%
PETROLEUM & RELATED INDUSTRIES	147,499	1.36%
OTHER INDUSTRIAL PROCESSES	252,925	2.34%
SOLVENT UTILIZATION	473	0.00%
STORAGE & TRANSPORT	5,559	0.05%
WASTE DISPOSAL & RECYCLING	21,031	0.19%
HIGHWAY VEHICLES	117,639	1.09%
OFF-HIGHWAY	664,642	6.14%
MISCELLANEOUS	138,980	1.28%
TOTAL:	10,827,311	100.00%

Total Industrial: 91.49%
Total Non Industrial: 8.51%

NATIONAL EMISSIONS SUMMARY: VOLATILE ORGANIC COMPOUNDS

EMISSIONS SOURCE (USEPA TIER1 NAME)	EMISSIONS (TONS/YEAR)	% OF TOTAL
FUEL COMB. ELEC. UTIL.	43,230	0.09%
FUEL COMB. INDUSTRIAL	109,166	0.22%
FUEL COMB. OTHER	380,990	0.77%
CHEMICAL & ALLIED PRODUCT MFG	87,208	0.18%
METALS PROCESSING	37,657	0.08%
PETROLEUM & RELATED INDUSTRIES	1,801,334	3.63%
OTHER INDUSTRIAL PROCESSES	364,148	0.73%
SOLVENT UTILIZATION	3,298,405	6.65%
STORAGE & TRANSPORT	1,193,084	2.40%
WASTE DISPOSAL & RECYCLING	185,099	0.37%
HIGHWAY VEHICLES	3,055,362	6.16%
OFF-HIGHWAY	2,618,719	5.28%
MISCELLANEOUS	4,696,390	9.47%
BIOGENICS	31,743,796	63.98%
TOTAL:	49,614,587	100.00%

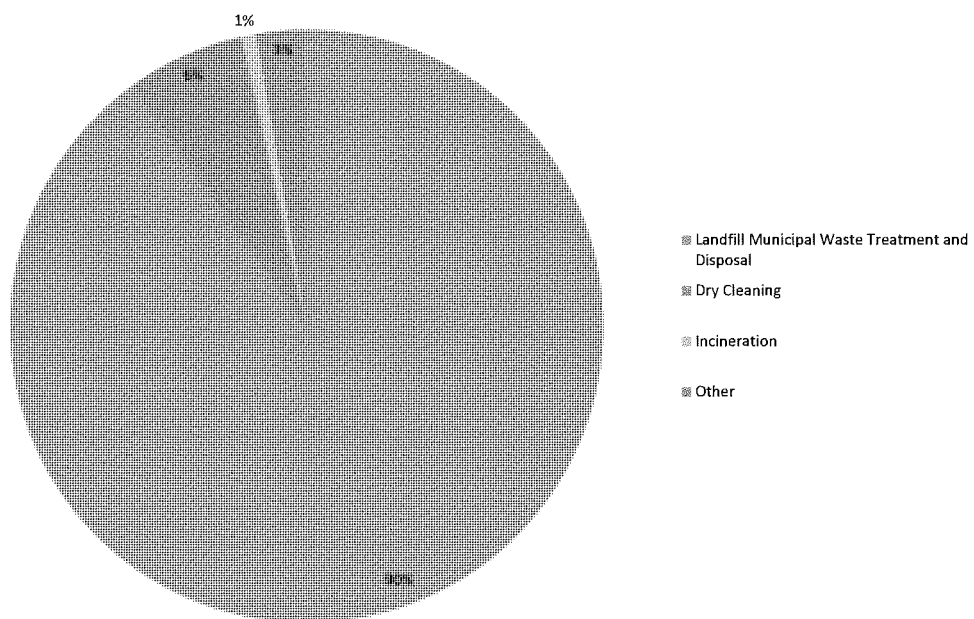
Total Industrial: 15.12%
Total Non Industrial: 84.88%

Source: USEPA National Emissions Inventory, 2008

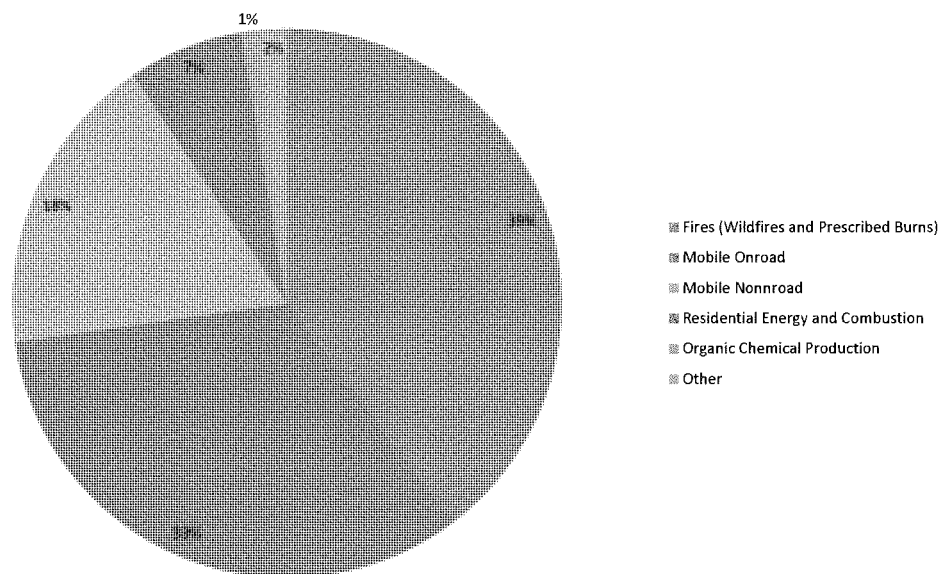
Appendix B

Sources of United States Toxic Air Pollutants

2005 NATA 1,1,2,2-Tetrachloroethane Emissions Percent Contribution By Sector

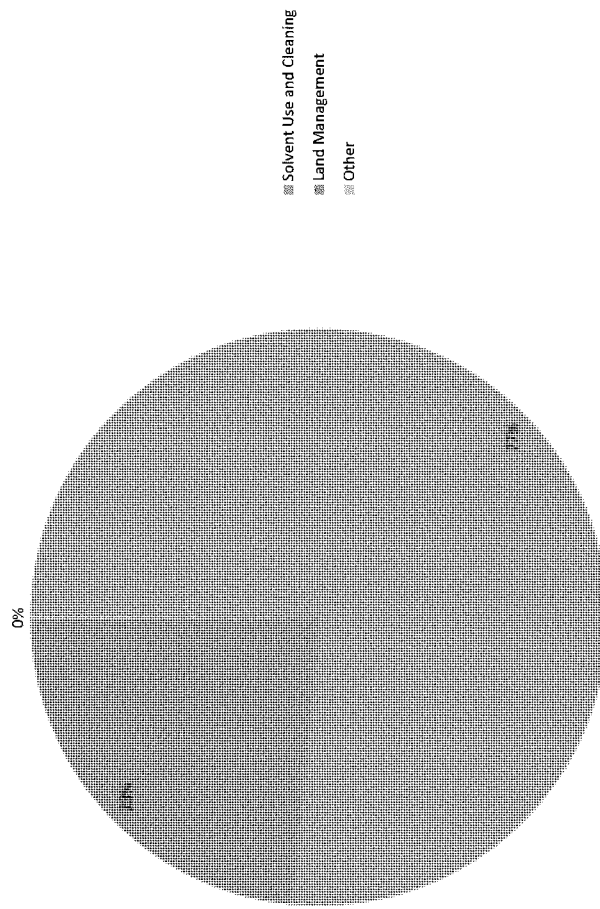


2005 NATA 1,3-Butadiene Emissions Percent Contribution By Sector

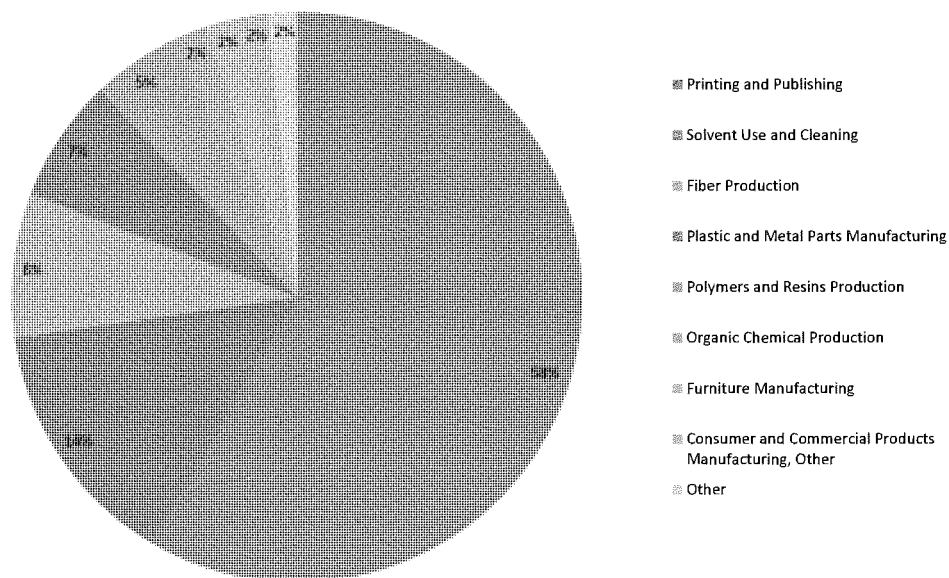


2005 NATA 1,3-Dichloropropene Emissions

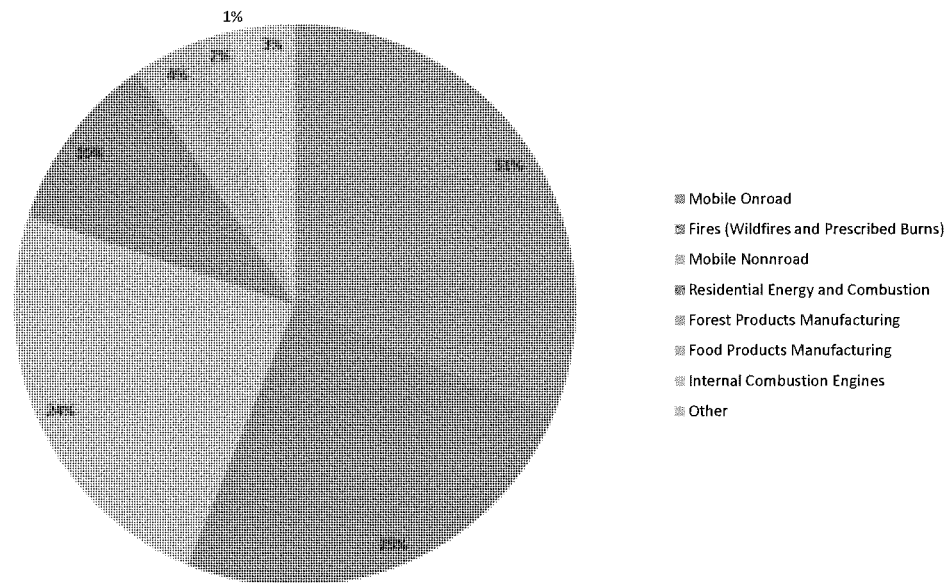
Percent Contribution By Sector



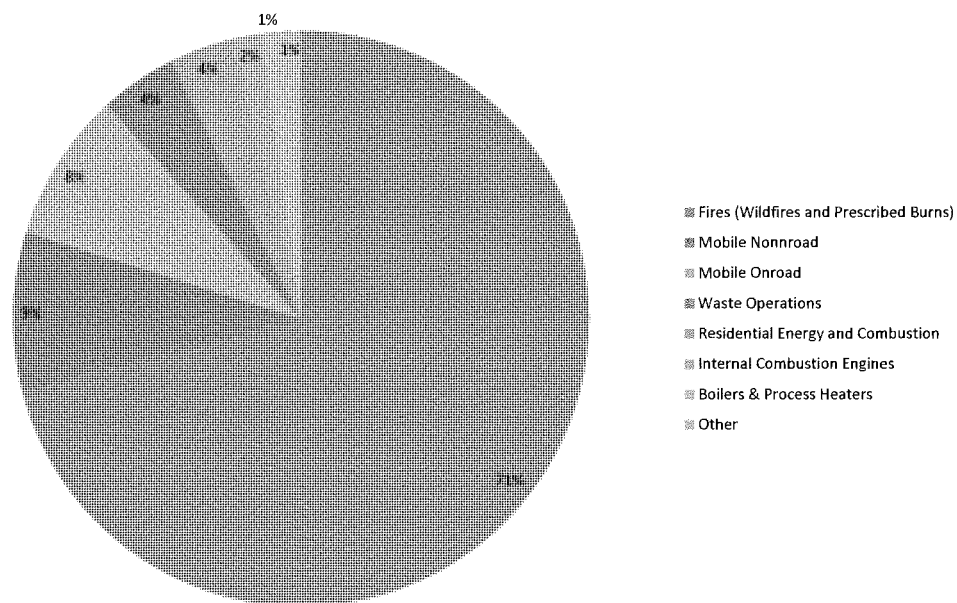
2005 NATA 2,4-Toluene Diisocyanate Emissions Percent Contribution By Sector



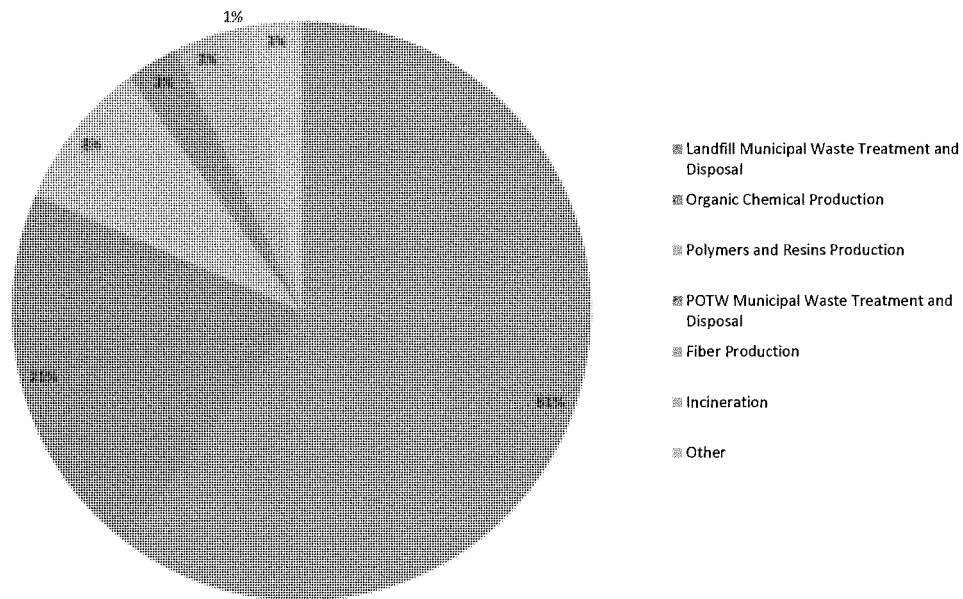
2005 NATA Acetaldehyde Emissions Percent Contribution By Sector



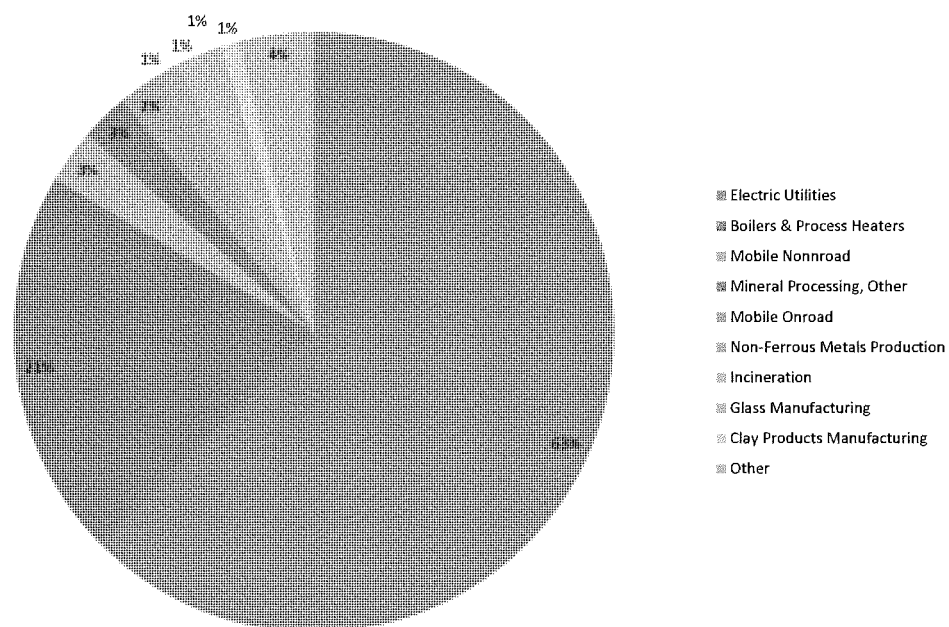
2005 NATA Acrolein Emissions Percent Contribution By Sector



2005 NATA Acrylonitrile Emissions Percent Contribution By Sector

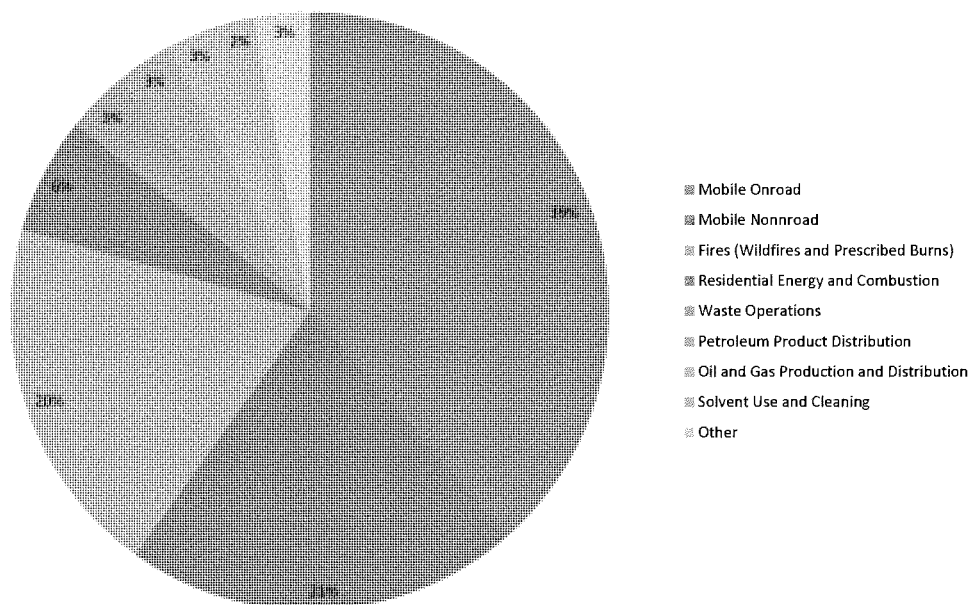


2005 NATA Arsenic Compounds Emissions Percent Contribution By Sector

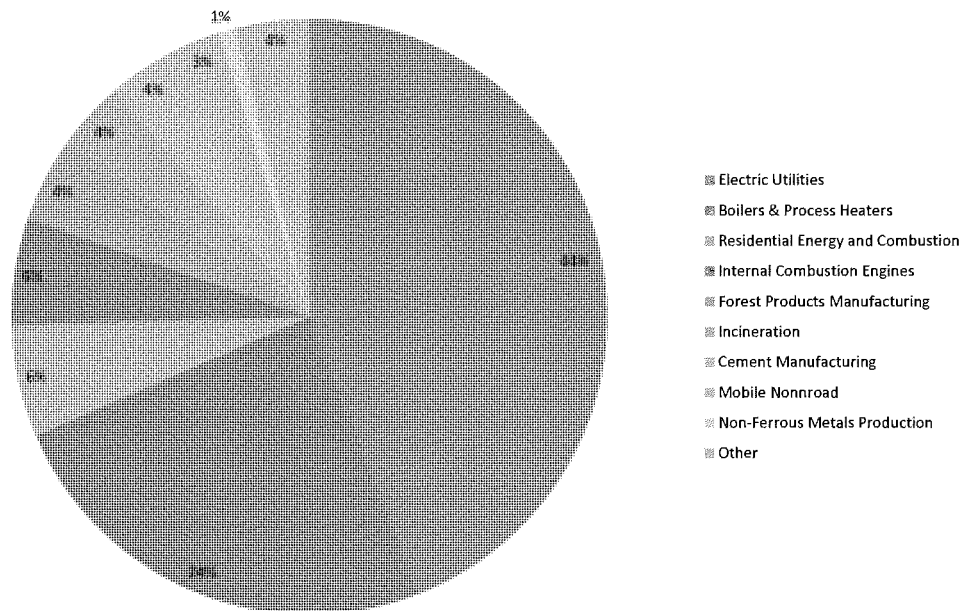


2005 NATA Benzene Emissions

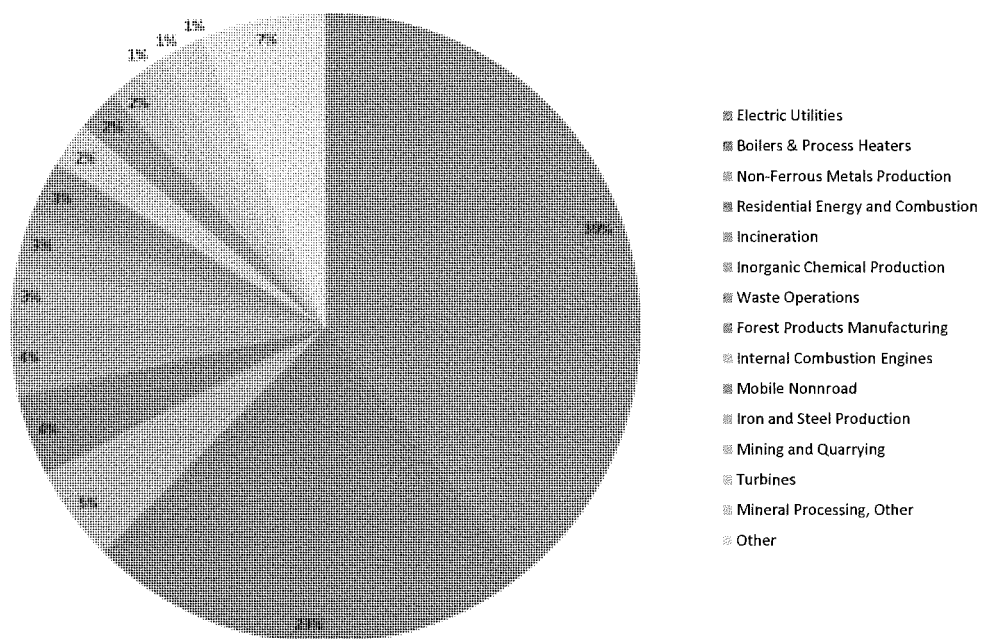
Percent Contribution By Sector



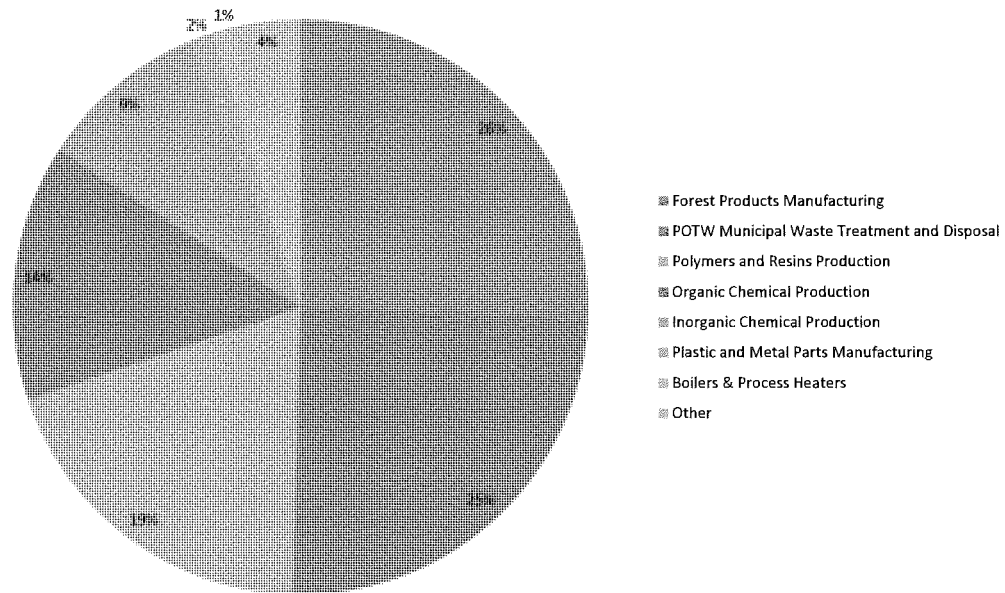
2005 NATA Beryllium Compounds Emissions Percent Contribution By Sector



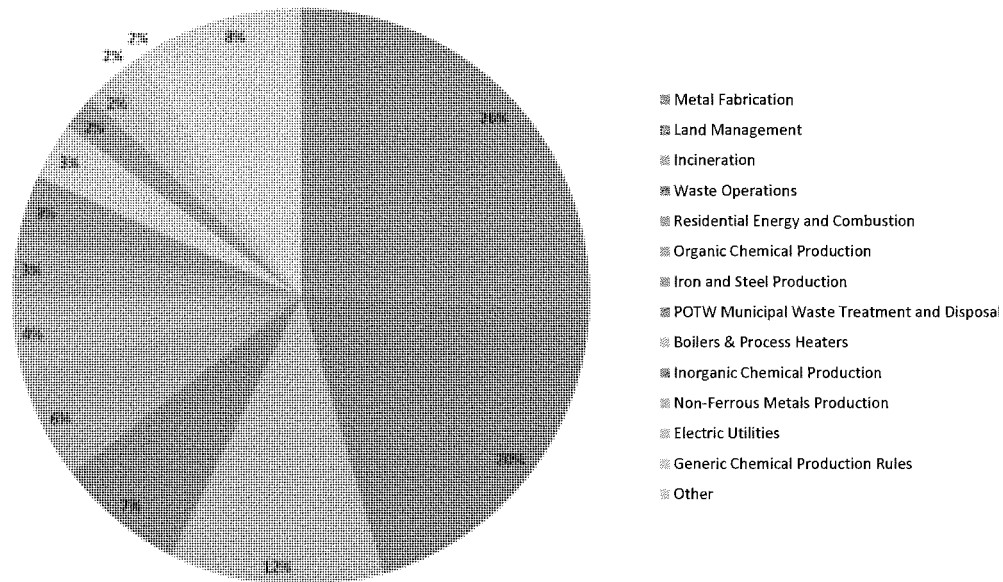
2005 NATA Cadmium Compounds Emissions Percent Contribution By Sector



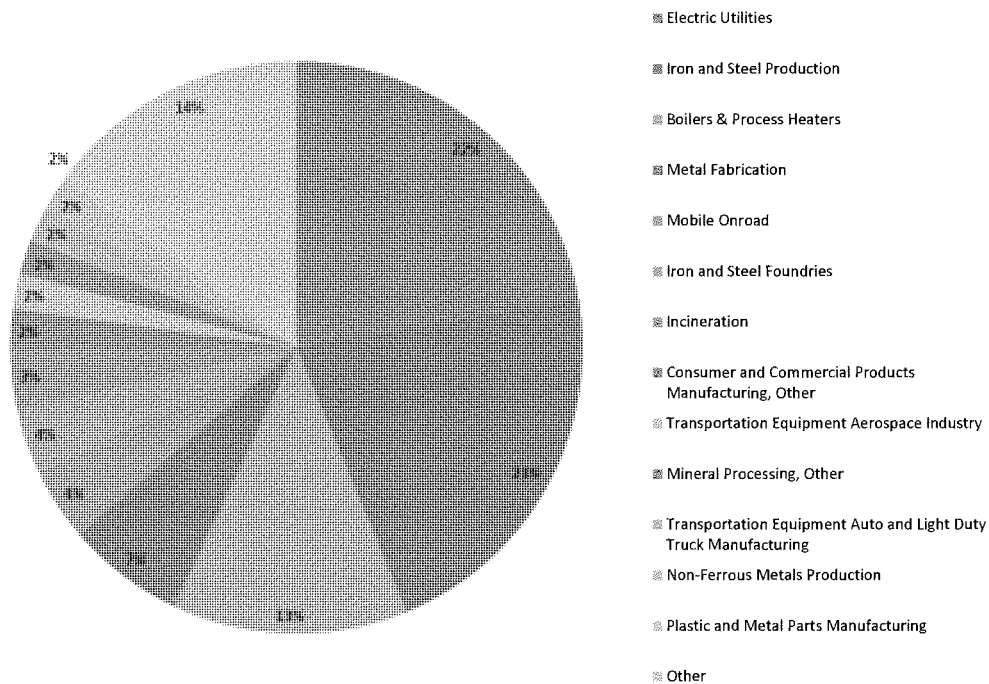
2005 NATA Carbon Tetrachloride Emissions Percent Contribution By Sector



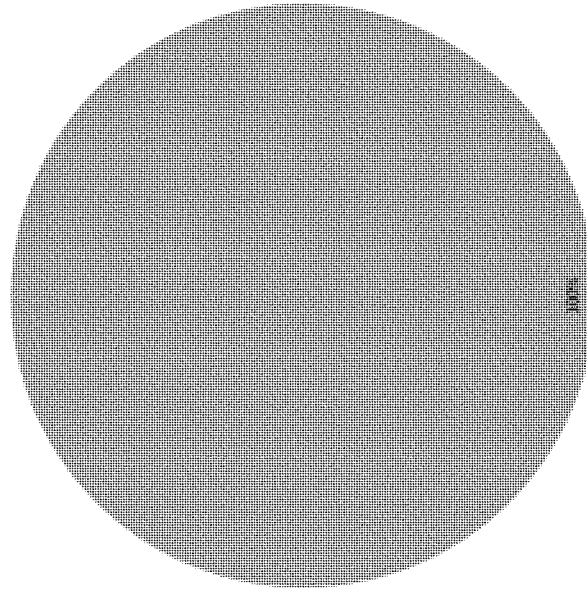
2005 NATA Chlorine Emissions Percent Contribution By Sector



2005 NATA Chromium Emissions Percent Contribution By Sector

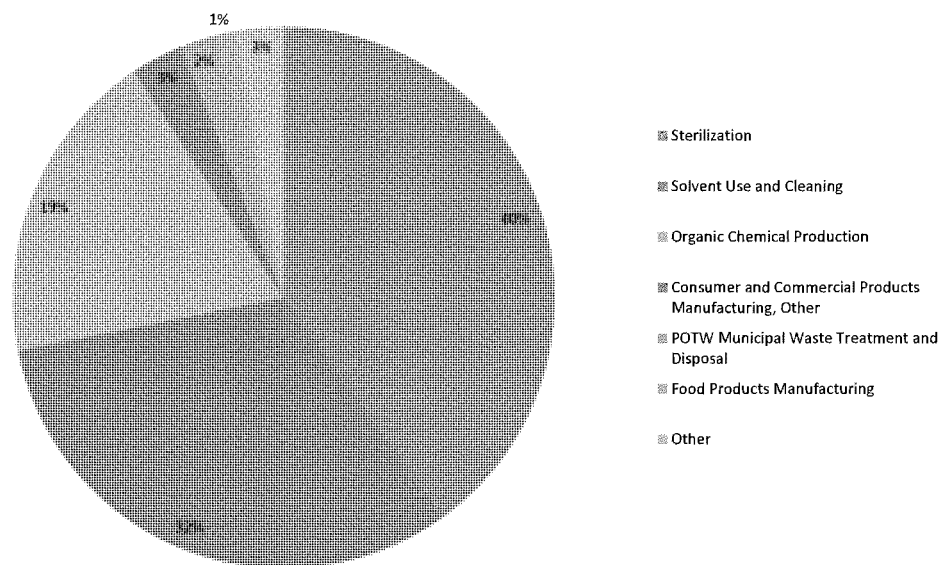


2005 NATA Coke Oven Emissions Percent Contribution By Sector

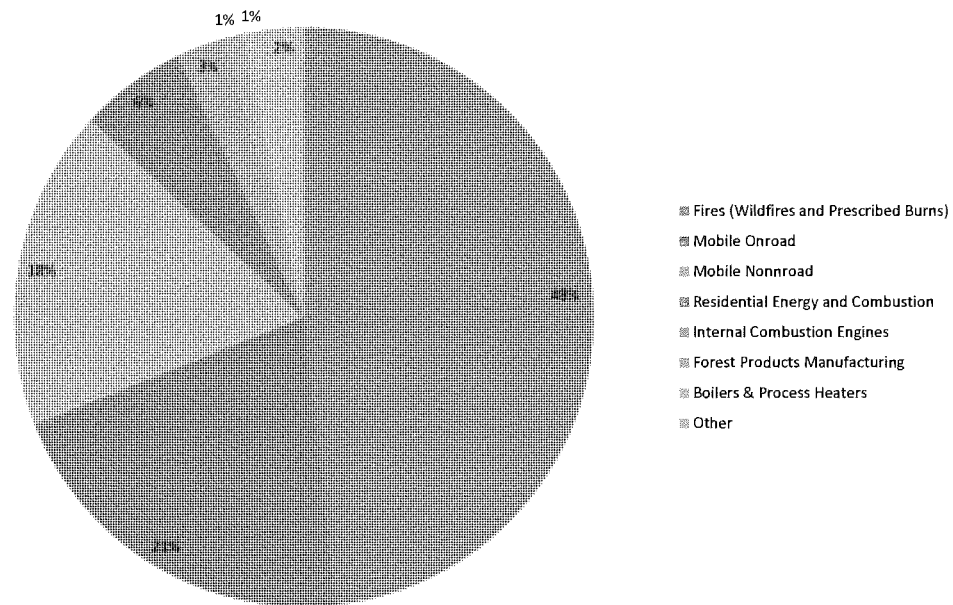


■ Iron and Steel Production

2005 NATA Ethylene Oxide Emissions Percent Contribution By Sector

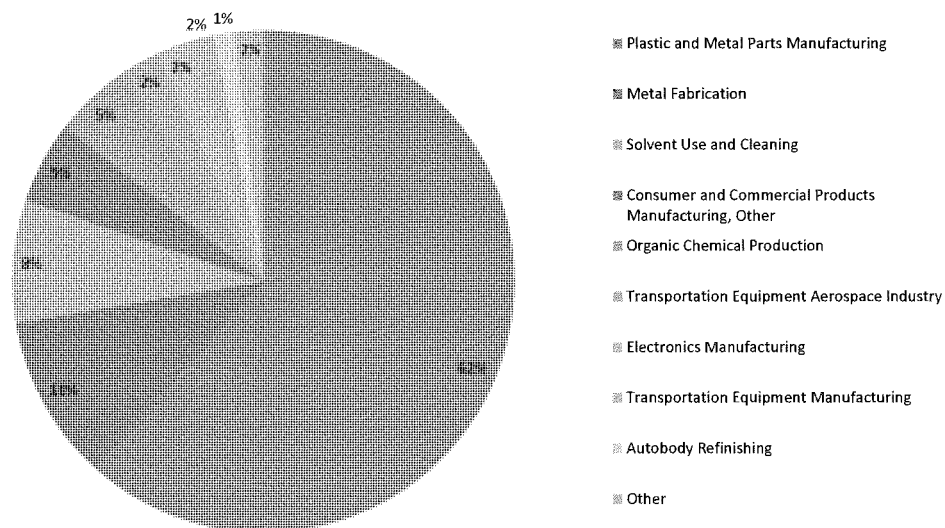


2005 NATA Formaldehyde Emissions Percent Contribution By Sector

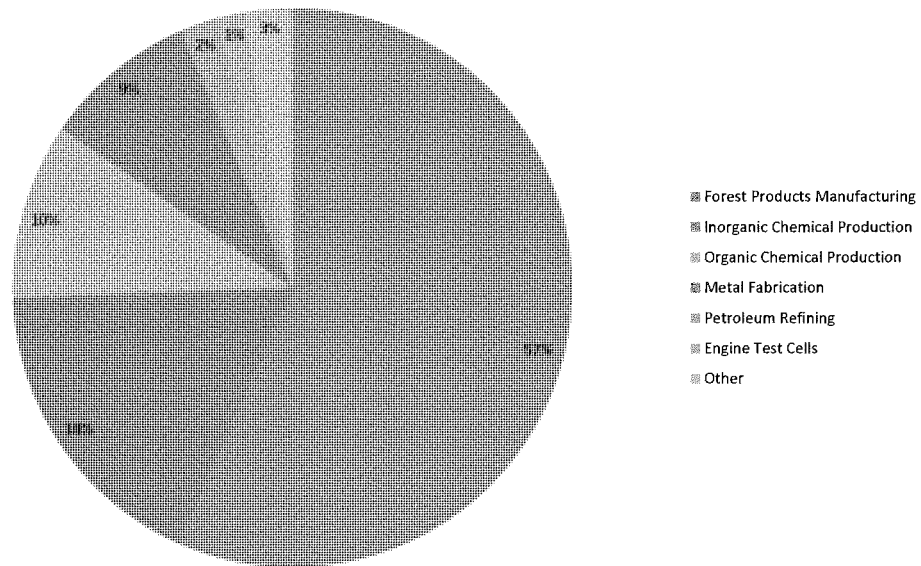


2005 NATA Hexamethylene Diisocyanate Emissions

Percent Contribution By Sector

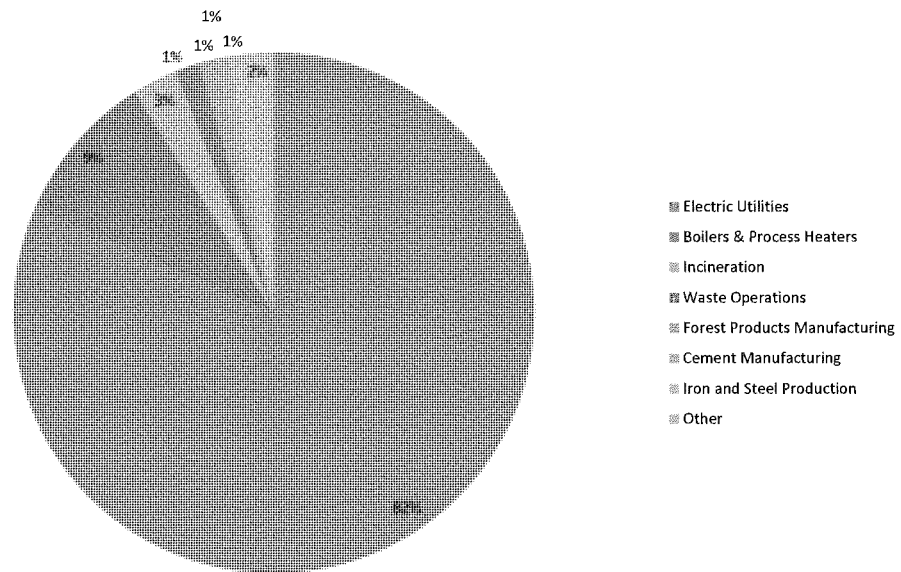


2005 NATA Hydrazine Emissions Percent Contribution By Sector

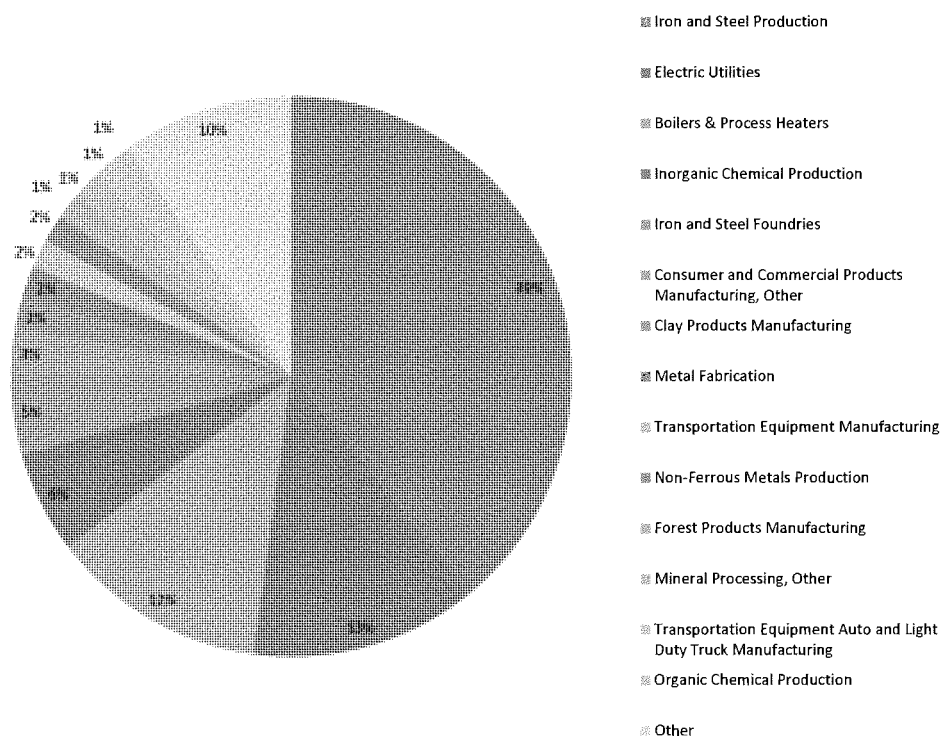


2005 NATA Hydrochloric Acid Emissions

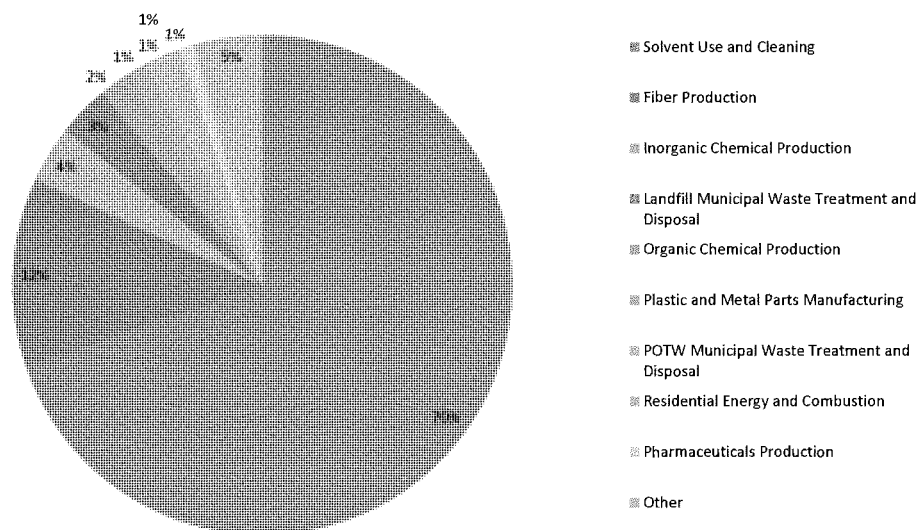
Percent Contribution By Sector



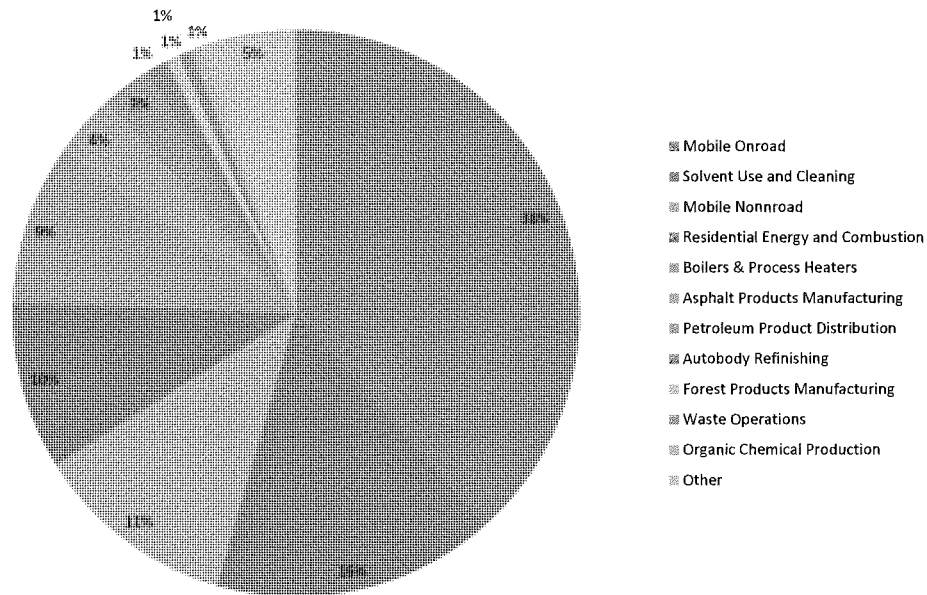
2005 NATA Manganese Compounds Emissions Percent Contribution By Sector



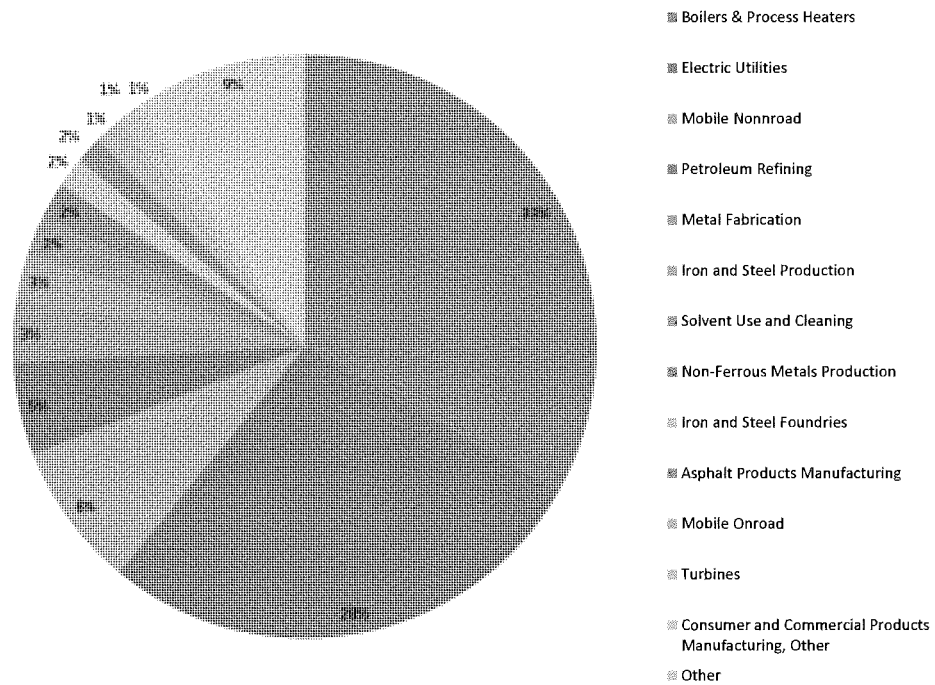
2005 NATA Methylene Chloride Emissions Percent Contribution By Sector



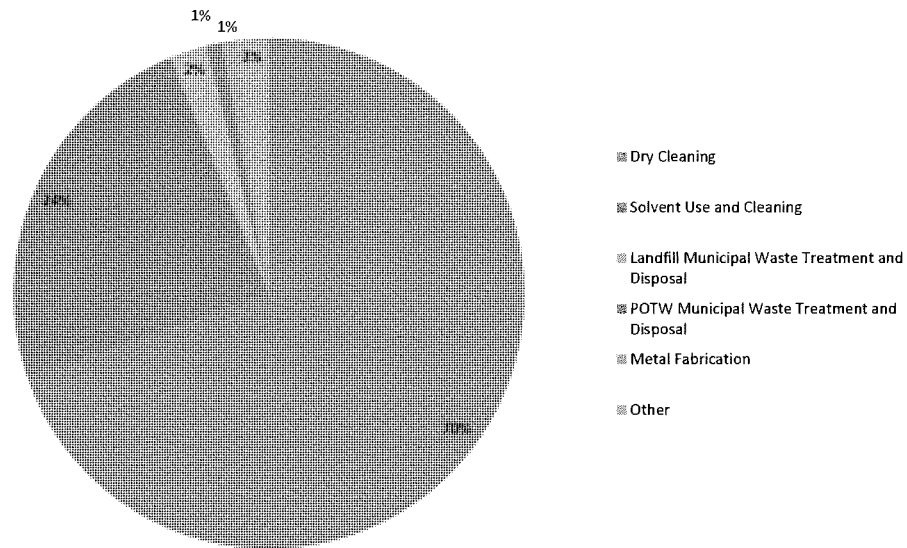
2005 NATA Naphthalene Emissions Percent Contribution By Sector



2005 NATA Nickel Compounds Emissions Percent Contribution By Sector

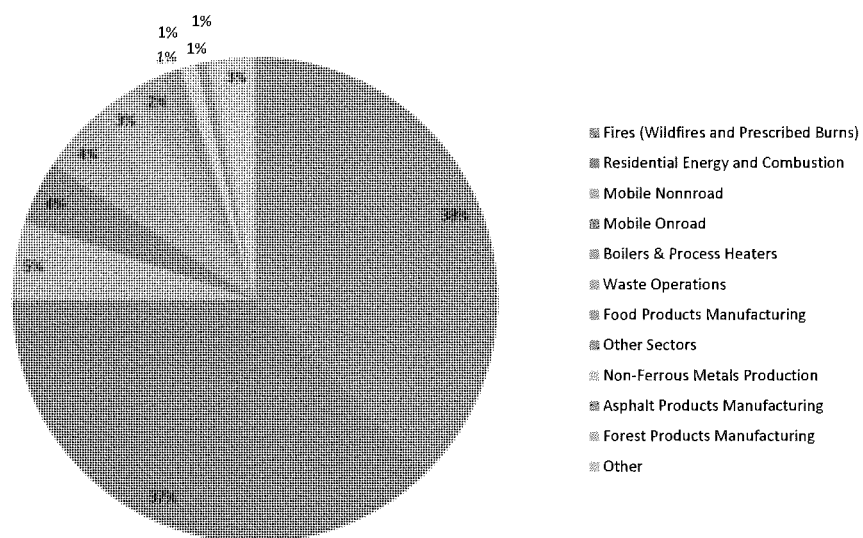


2005 NATA Tetrachloroethylene (Perchloroethylene) Emissions Percent Contribution By Sector

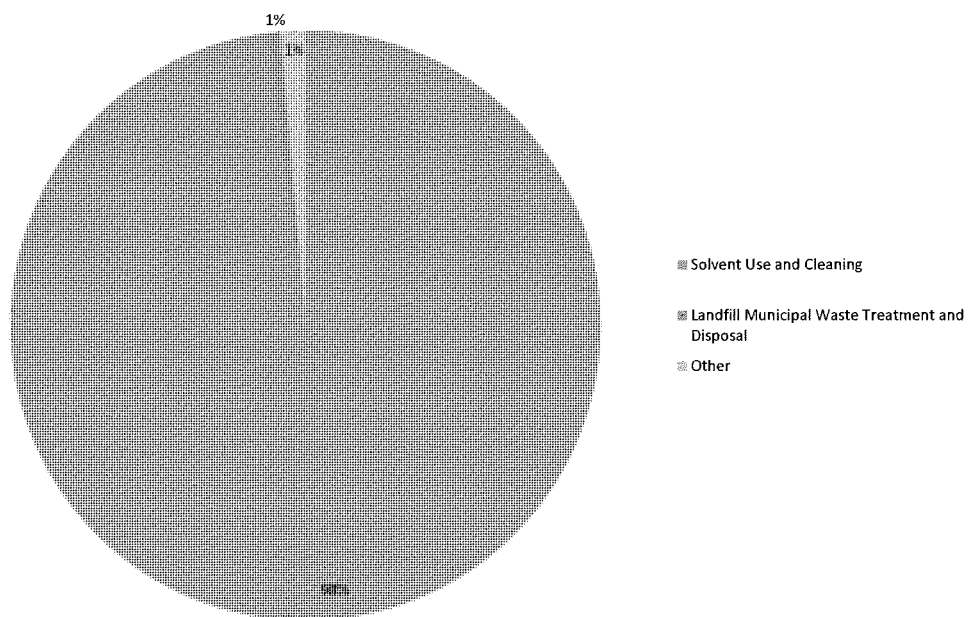


2005 NATA Polycyclic Organic Matter Emissions

Percent Contribution By Sector

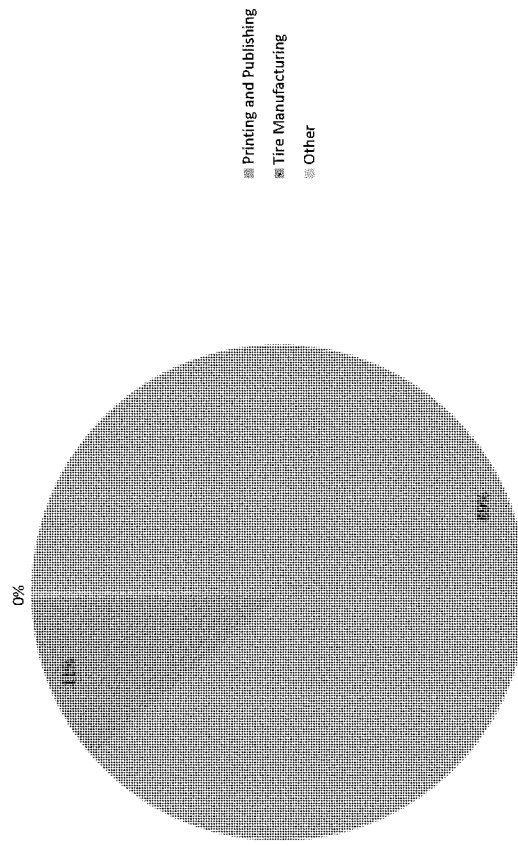


2005 NATA 1,4-Dichlorobenzene Emissions Percent Contribution By Sector



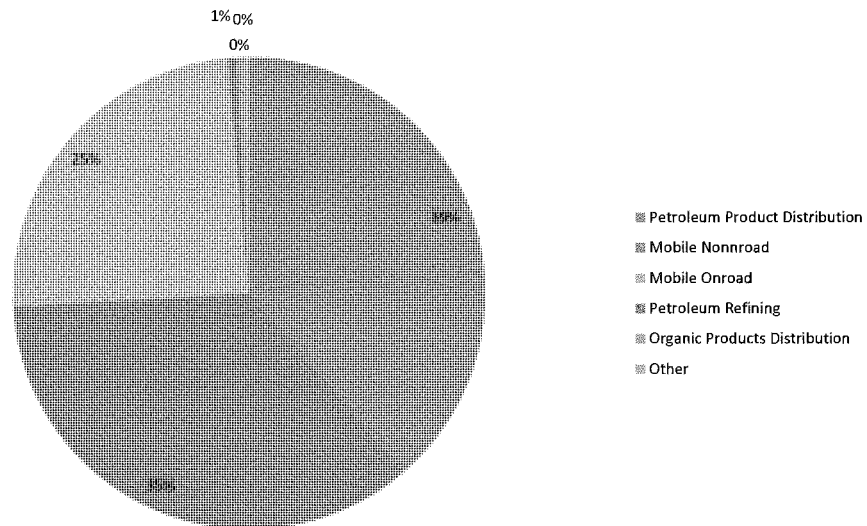
2005 NATA N-Nitrosomorpholine Emissions

Percent Contribution By Sector



2005 NATA Methyl Tert-Butyl Ether Emissions

Percent Contribution By Sector



Richard Trzupek – Biography

Richard Trzupek is a chemist, BA Loyola University of Chicago (1989). He has worked in the environmental industry for thirty years, first as a stack tester (measuring the amounts of air pollutants emitted from industrial smoke stacks) and then as an environmental consultant to industry. Mr. Trzupek is the author of numerous articles focusing on environmental topics and several books, including McGraw-Hill's *Air Quality Permitting and Compliance Manual*, and, most recently, *Regulators Gone Wild: How the EPA is Ruining American Industry* (Encounter Books).

Chairman HARRIS. Thank you very much, and we will move on to Dr. Goldstein. Welcome back.

**STATEMENT OF DR. BERNARD GOLDSTEIN,
PROFESSOR AND DEAN EMERITUS,
UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH**

Dr. GOLDSTEIN. Thank you, Chairman Harris and Ranking Member Bonamici and Members of the Subcommittee.

I certainly agree with my fellow witnesses that we have come a long way in almost a half a century of environmental protection, and I routinely teach that to my students. I know of no one who teaches otherwise. But it does remind me of the personal experience of being at the end of a really productive day when I should take satisfaction in all I have accomplished but I find that I actually have more to do than when I started. Like EPA, I am further behind for two reasons. There are unforeseen challenges and some of the tasks are even more complex than I thought they were, and I will enlarge on that just briefly.

New scientific tools have allowed us to identify hazards affecting our health and our well-being that we cannot see or smell, but despite our progress, we have new challenges to meet. When EPA was formed, the term "nanotechnology" had not been invented and the term "cellular telephone" would not have been understood. In my estimations, concerns about GMO food and cancer due to cell phones are largely unfounded, but I can say that only because of the science that has been developed to explore the issues. European leaders would like to have our measured response to concerns about cell phones and Frankenfoods. On the other hand, nanotechnology and other emerging technologies present real issues that must be addressed in order to maximize their promise of bettering our lives and of economic benefits while minimizing risk.

Improvement in many aspects of air pollution is evident but science shows that some of the threats, notably from ozone and from particulates, are worse than we thought and more challenging to control. For both pollutants, there is ample evidence of significant adverse health effects at even lower pollutant levels and affecting more people than previously appreciated, and not just in the United States but from studies all over the world. Just one is a recent study of a large national cohort showing a statistically significant mortality increase down to levels of fine particulates that are well below our current standard.

For ozone, the change in standard from 1 hour to an 8-hour averaging period reflects the regulation that American society was changing in a way that put more people and particularly children at risk. We once had geographically well-defined cities with limited rush hours leading to a late morning ozone peak, but traffic now extends throughout the day. Urban sprawl is a fact of our life and daylong ozone problems do exist. More recently, studies have suggested an independent association of daily ozone levels with mortality so that ozone is affecting not just our children but our adults as well.

Secondly, both fine particulates and ozone are not simple end-of-pipe products but rather are transformed in the air from multiple

precursors coming from multiple sources. It is not surprising that each source points to another as being the major cause. We need to control decisions to be made on the best science, not on the best lobbying skills.

Both pollutants also exemplify the challenge of significant contributions coming from multiple, small point sources, which is also a major problem in relation to clean water issues, which I do not have time to go into. An example is the rapid increase in shale gas drilling in local areas that are already near or above ozone or fine particulate standards.

The Clean Air Act requirement that EPA review the scientific basis for the National Ambient Air Quality Standards every five years has been highly instrumental in leading to more effective regulation. Contrary to the repeated, and I emphasize, erroneous statement that the air pollution standards are routinely tightened by these reviews, most times the scientific review has led to no change in the existing standard and at times has even lead to relaxation or elimination of the standards. Revisiting standards should be the norm for all environmental regulation.

Global climate change is clearly a major challenge. It is occurring. The EPA received its first funding to look at this issue from President Reagan in 1984 when I was at EPA as President Reagan's appointee in charge of research and development. It was clearly predicted then by the National Academy of Sciences that a rise in global carbon dioxide would make the earth warmer and set in motion a variety of planetary climate changes of potentially major consequences to us. This prediction has been more than amply borne out by the temperature records, and there is no need to go through the fact that last year was the hottest year on record. Nine out of the last ten years have been the top 10 in U.S. temperature.

Among the overall scientific community, only a relatively tiny handful of climate change deniers exist, and those few as well as those who give them undeserved credence, need to at least wonder as they compulsively quibble about the extent to which they bear responsibility for the consequences for the American public of our delay. The threshold for action should not be the overwhelming evidence that is already in place. The threshold should be sufficient evidence to take out an insurance policy to protect the American public. We passed that threshold a long time ago.

Finally, I would like to talk about sustainability. I chaired a National Academy of Science-National Research Council committee. We began by recognizing that the increasingly complex challenges of today require us to make effective tradeoffs among the environment, economic and with health, and social issues. We learned much about the actions that are already taking place, and we have developed a framework, which I have here and I would be willing to hand out, and it is part of my written testimony, that we believe will lead to improving our ability to meet these increasingly complex challenges across all of the environmental areas.

The goal asked for by the U.S. Environmental Protection Agency, by today's Environmental Protection Agency, is to be able to maximize benefit while minimizing risk. We have to be able to give the

tools to EPA to cut across all these various things working with other agencies to make this happen.

Finally, we can today either be optimistic about how far we have gone or pessimistic about the challenges of the future. Optimism or pessimism is classically defined in terms of whether we see the glass as half full or half empty. For a sustainable future, where we are now requires us that we must consider the glass to be twice the size it needs to be. We must be able to give EPA and other of our federal agencies the ability to right-size that glass so that we can move forward in the future and be able to respond to all the challenges we are addressing now and will meet in the future. Thank you.

[The prepared statement of Dr. Goldstein follows:]

Committee on Science, Space, and Technology
Subcommittee on Environment

***State of the Environment: Evaluating Progress and
Priorities***

February 14, 2013

Testimony

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Graduate School of Public Health
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In thinking over the challenge of testifying about the past, present and future of environmental protection and public health, it seems to be reminiscent of the many times when at the end of a really productive day, when I should take satisfaction in all I've accomplished, I find that I actually have more to do than when I started the day

I'm usually further behind for two reasons: unforeseen challenges have been added to my work load, and at least some of the tasks that I have worked on are even more complex than I thought they were.

Our almost 50 years of environmental control is similar in that we can be proud about how much we have accomplished, but new challenges keep coming in, and we have learned so much more about how the environment affects our health and our social and economic well-being, that we know that there is much more that we can and should do.

The evidence that our environment is improving is plain to see, and I mean that literally. Bill Ruckelshaus, the first head of the EPA, appointed originally by President Nixon, and then by President Reagan, has joked that the reason that EPA was formed was that the people in Denver wanted to see their mountains - and the people in Los Angeles wanted to see each other. Mountains and people can now be seen. Our rivers are not on fire, pesticides are being controlled to better protect our natural environment and our health, and we no longer are allowing hazardous waste to despoil our water and our local environment. The tools provided by risk analysis and by advances in the sciences of toxicology, exposure assessment, epidemiology and economics have allowed us to identify environmental hazards affecting our health and our well-being that we cannot see or smell. But, despite our progress, for air and water and wastes we have new challenges to meet, both because of improvements in our science in detecting these challenges to our health and well being; and because our world has changed in so many ways, including how and where we live, the technologies that we use, and our connections to the rest of the world. We have also recognized how closely environmental concerns and environmental controls are related to much broader economic and social issues. In the next few minutes I will briefly describe some of the progress but will focus on the lessons learned and the challenges ahead which require a vibrant EPA supported by a strong scientific base to ensure our future. In view of the limitations of time and space, I will focus my discussion of the past and present on clean air issues; and of the future on sustainability as a way to meet the challenges of the day by incorporating economic and social considerations into environmental control.

Clean Air

Improvement in many aspects of air pollution is evident. For the six primary air quality pollutants there have all been significant decrements in ambient levels, reflecting the actions of states in responding to failure to attain standards, as well in many cases to other environmental efforts that have had the co-benefit of reducing emissions of primary air quality pollutants. But despite improvements, new science shows that some of the threats, notably from ozone and from particulates, are worse than we thought and are more challenging to control. Both of these pollutants exemplify my theme of how far we have come but yet how much further we need to go.

For both pollutants, advancing scientific information has led to evidence of significant adverse health effects at even lower pollutant levels and affecting more people than previously appreciated. Some of these effects are of obvious clinical importance, such as acute mortality, others are more subtle yet still significant.

The original 1970 outdoor air standard for particulates was based on total weight. This was the wrong target. Control measures, which predictably aimed at the heavier particles, did little to address fine particulates which are able to penetrate deeply into the lung and are responsible for the bulk of the adverse effects. The PM10 standard partially addressed this issue, but newer pollution measurement technology was needed to develop the PM 2.5 standard which more closely approximates particle sizes responsible for health effects. These advances in exposure science and toxicology, coupled with advances in the science of epidemiology, now clearly demonstrate the toll taken by fine particulates in the nation's health. To the evidence that daily variations in fine particulates are associated with a significant increase in mortality and morbidity has been added further evidence of the long term impact of breathing these particulates for many years. A recent study of a large Canadian national cohort followed for 20 years showed a statistically significant mortality increase down to levels of fine particulates that are well below our current standard (Crouse et al, 2012). Their overall findings on the impact of an increase in 10ug/m3 of fine particulates (PM2.5) on all non-accidental causes of death in Canada was 15%, and for deaths from ischemic heart disease was 31%. This is even larger than the 12-14%/per 10ug/m3 increased risk of cardiovascular mortality from long term exposure estimated by Chen (2008) from a systematic review of US and international studies, but is similar to the findings of the large American Cancer Society cohort study which estimated a 1.29 relative risk for a 10ug/m3 change in ambient PM 2.5 concentration (Krewski et al, 2009). Notably, a more recent study by Correia et al (2013) reported that a decrease in 10ug/m3 in fine particulates was associated with an increase in overall US life expectancy of 0.35 years.

For ozone, the change in standard from a one hour to an eight hour averaging period reflects the recognition that American society was changing in a way that put more people, and particularly children, at risk (Rombout et al, 1986). The one hour ozone standard initially reflected the action of sunlight on ozone precursors that accumulated in the air during the short well-defined morning rush hour in geographically well-defined cities. Such limited rush hours, unfortunately, are a thing of the past as traffic extends throughout the day, and urban sprawl is a fact of our life. We now recognize that ozone levels are usually highest downwind from cities in suburban areas. We also recognize that children are particularly vulnerable to the effects of ozone, and that children are likely to be outdoors exercising throughout the warm summer days which meteorologically promote ozone accumulation. The resultant change to an eight hour standard also was economically more appropriate as it led to avoiding control strategies that lessened the one hour peak merely by spreading the ozone exposure throughout the day. More recently, studies strongly suggesting an independent association of daily ozone levels with mortality have put further pressure on reducing the ozone standard to protect public health (CASAC, 2012).

Secondly, both fine particulates and ozone are not simple end of pipe products but rather are transformed in air from multiple precursors coming from multiple sources. A broad range of industries

and personal activities serve as the sources for these two pollutants. It is not surprising that each source points to another as being the major source. To most cost-effectively control both pollutants we need additional research focused on refining our ability to attribute sources. For fine particulates we have the added challenge of further determining the chemical and physical constituents that have the greater effect so we can more effectively direct control strategies. However, let me emphasize that based on present knowledge all sources of these two pollutants contribute to their formation and to their toxicity.

Both pollutants also exemplify the challenge of significant contributions coming from multiple small point sources. As just one example, the recent rapid increase in shale gas drilling in local areas that are already near or above ozone or fine particulate standards presents multiple small sources that may impact on attaining the area-wide health-based standard. While in the aggregate their emission levels would be subject to usual air pollution control considerations, the activities related to any single well may not exceed the allowable emission thresholds.

Estimates of the impacts of

One additional point in regards to the control of air pollution is worth noting. The Congressional requirement in the Clean Air Act that EPA review the scientific basis for the standard every five years has been highly instrumental in leading to more effective regulation. Contrary to the repeated erroneous statement that the NAAQS standards are routinely tightened, in the large majority of times the scientific review has led to no change in the existing standard, and at times has even led to relaxation or elimination of standards. Revisiting standards should be the norm for all environmental regulation.

Other Direct Sources of Environmental Pollution

Achieving clean water also exemplifies the issue of much progress but much more to be done. Spewing of wastes directly into water bodies is largely a thing of the past, due in large part to command and control regulatory approaches that make it far more efficient to develop processes that avoid waste as well as to better end-of-pipe control technologies. Through experience, industry has learned that it is usually far more cost-effective to design to avoid waste streams. But yet the dead zones in the Chesapeake and the Gulf of Mexico are stubborn problems because of non-point sources. EPA has shifted gears to develop guidelines for nutrient runoff which need to move forward using the best science. Similarly, while there has been great progress in decreasing the use of land as a place to dump wastes, new challenges continue to appear – electronic wastes just being one example.

Global Change

There is no question that Global Climate Change is occurring. George Bush, in his 2007 State of the Union address noted the “serious challenge of global climate change”. EPA received its first funding to look at this issue from President Ronald Reagan in 1984. It was well understood then that the extent to which sunlight radiated off of our planet into space affected surface temperature, and that carbon

dioxide was a major factor in absorbing this radiation thereby keeping its warmth on the Earth. It was clearly predicted then that a rise in global carbon dioxide would make the earth warmer and set in motion a variety of planetary climate changes of potentially major consequences to human well being. This prediction has been more than amply borne out by the temperature records. As I am sure we are all well aware, 2012 was by far the hottest year ever recorded in the United States – one count has us setting over 5 times more daily record highs than record lows. Among the overall scientific community only a relatively tiny handful of climate change deniers exist, and those few, as well as those who give them undeserved credence, need to at least wonder, as they compulsively quibble, the extent to which they bear responsibility for the consequences to the American public of our delay in addressing this important issue. But the threshold for action should not be the overwhelming evidence that is already in place. The threshold should be sufficient evidence to take out an insurance policy to protect the American public – a threshold level that we passed a long time ago. We need actions across our government, but particularly from congress and from EPA. These actions should fall under the heading of primary and secondary prevention. Primary prevention requires us to cut back on those factors which cause greenhouse gas emissions; and secondary prevention requires preparation to mitigate the consequences when they do occur. We want to avoid tertiary prevention, such as providing temporary homes for those affected by Superstorm Sandy, and the \$70-100 billion economic consequences of such extreme storms. The choices are difficult and require careful evaluation of the inevitable tradeoffs. But it is a challenge that we must meet and we can only meet this challenge with a vibrant EPA and by a congress able to make tough decisions.

Let me provide an example of a contentious scientific issue which was largely resolved by the accumulating scientific evidence and, most importantly, by congressional action which had significant co-benefits. We do not hear much about acid rain any more, but in the 1970s and 1980s it was a major issue. The National Acid Precipitation Assessment Program, a cooperative effort among federal agencies, was successful in narrowing differences among scientists such that only the occasional scientist would still claim either that there was acid rain was no problem at all or, on the other side, that we faced imminent destruction of Northeastern forests and lake systems. Congressional action, most notably through a cap and trade program, has been eminently successful in removing sulfur oxides and nitrogen oxides emissions with a resulting partial response of acid-sensitive ecosystems, as well as the co-benefit of significant human health benefit as it was only later that we fully recognized the implications of these emissions to fine particle formation (Burns et al, 2011)

Global climate change is just one of the major challenges to effective protection of public health and the environment. There will be issues that now exist but have not been adequately recognized, some real, some alarmist. Looking backwards, household radon, a potent public health threat estimated to cause 21,000 deaths per year, only belatedly was recognized as a health concern. This recognition has led to mitigation of the risk. Similarly, I was at EPA when the realization of potentially high levels of asbestos in schools led Congress to pass the Asbestos School Hazard Abatement Act. Inevitably, there will be new technology that will require careful consideration of potential benefits and costs. When EPA was formed in 1970 the term nanotechnology had not been invented and the term cellular telephone would not have been understood. Nor was the public concerned about “frankenfoods”. In my estimation,

concern about GMO foods and cancer due to cell phones is largely misplaced, but I can say that only because of the science that has been developed to explore the issue – and EPA and other federal agencies such as NIEHS and FDA have been central to developing this science. On the other hand, nanotechnology and other emerging technologies present real issues that must be addressed in order to maximize economic benefits while minimizing risks

What will be the new challenges? Many will come from the same driving forces of today. New technologies will emerge that will need to be controlled. With expansion of the global economy some of these new technologies will come from countries that have far less rigorous command and control of potential adverse consequences than are now an integral part of environmental control in the United States and other developed countries. We already have seen that global pollution increasing with the rapid growth of the Chinese economy; and we know that the world's bulk chemical industry is shifting toward developing countries. Population growth continues to put additional pressures on the world's resources in ways that are no longer limited to a single country or region, and the changing interface between people and the environment, along with global climate change, may well lead to new challenges such as emerging infections that know no geographical boundaries. Nor are geographical boundaries as relevant to American business, meaning that for good or bad our economic well-being is more tied to world forces, including the environment, than in the past.

I have focused on EPA, but other agencies have been heavily involved in protecting human health and ecosystems. Scientific studies and assessments led by NIEHS and by CDC have been central to EPA's cost benefit analysis that finally removed lead from gasoline under President Reagan. Based on their knowledge, HUD and state and local agencies have begun the long overdue work needed to remove leaded paint from homes. HUD believes that lead abatement provides a major overall economic benefit. They estimated that in the first five years of operation of the Federal Residential Lead-Based Hazard Reduction Act the expenditure of \$582 million would lead to \$2.65 billion in total benefits (*add HUD ref*). But it remains shameful how little has been done to rid our society of this menace which, in 2002, was estimated as costing the United States \$43.4 billion dollars each year (Landrigan et al, 2002). (This group did a similar analysis of other childhood impacts of environmental agents on asthma, pediatric cancer and neurobehavioral disorders which led to a total cost estimate of 2.8% of US health care costs). EPA's recent strategic plan to address children's environmental issues contains many valuable approaches to this central issue in environmental health and in sustainability (EPA, 2013)

Economic Growth

Evidence of the overall economic value of environmental regulation is not hard to find. Some of the analyses are related to putting a cost to the adverse effects of environmental agents on human health, such as in the examples I have described above or in a recent study by the Rand Corporation reporting that the costs of air pollution from shale gas drilling activities in my home area of Southwest Pennsylvania in 2011 were estimated as \$7.2 to \$32 million. Other analyses, including early studies by Carpenter et al (1979) relating air pollution to hospitalizations, and more recent studies by Nordhaus

and his colleagues at Yale, have shown that air pollution damages exceed value added for numerous industrial sectors, most notably for coal-fired electric power generation. The EPA has recently released an SAB-reviewed report on this concluding that the overall benefits of the 1990 CAA far exceed costs (EPA, 2011).

There are of course arguments among economists as to how to estimate costs and benefits associated with environmental regulation – or any other type of regulation. I want to emphasize one aspect of regulatory command and control which has major benefits to our economy that cannot be readily measured. Our economic growth is heavily dependent upon venture capital investment in new technologies. Regulation lessens the uncertainty that is a hindrance to investment. As is clear from a perusal of its web sites, EPA is also very much involved in helping businesses meet regulatory requirements and in economic savings

Example Related to Anesthesiology

In considering how best to present to this committee why these newer global problems are so much more challenging than the older ones, I remembered a study my colleagues and I performed that was directly related to the field of anesthesiology. This, of course, is the medical specialty of the distinguished chair of this subcommittee, Congressman Harris. In the 1960s and 1970s a number of reports in the medical literature suggested that women who worked in operating rooms were more likely to have spontaneous abortions and to give birth to malformed fetuses. We published, in *Lancet (ref)*, evidence that energy devices used in the operating room, such as electric cauteries, X-rays and lasers, were causing chemical reactions with the anesthetic agents that had accumulated in operating room air. We hypothesized that the resulting derivatives might be responsible for developmental abnormalities. We did not get to follow up on these findings for a very good reason. The rules for hospitals changed to increase ventilation such that it is no longer possible for anesthetic gases to accumulate within the room, an approach which has the co-benefit of removing airborne infectious agents – the good news is that further studies have not shown reproductive and developmental risks in females working in operating rooms. This very good example of command and control simply will not work for global issues like climate change. One can open operating rooms to the outside, thereby protecting the inhabitants. There is no outside for our earth. If our hypothesis about anesthetic gases was correct, and the operating room was a fully closed system like our earth, the only protections would be within the operating room, such as preventing the release of anesthetic gases, or scavenging the agents within the room, or having operating room personnel wear gas masks. For global climate change, we must do our best to prevent the release of gases which underlay these changes, and work to lessen and to mitigate the effects. Ironically, the anesthetic study I described was performed in the operating rooms of Bellevue and University Hospitals, two of the five New York area hospitals shut down for more than a month by Superstorm Sandy – with an estimated \$3.1 billion dollar cost to get them open again, as well as uncalculated consequences to the health of those dependent on the care provided by these hospitals.

Sustainability

Let me start my discussion of sustainability by thanking Chairman Harris and the Committee members for the charge to the witnesses at today's hearing to provide testimony related to the trade-offs that are necessary to achieve protection of human health and the environment. Beginning in November 2011, I chaired the National Research Council's Committee on Sustainability and the US Environmental Protection Agency. Our report focuses on just how to achieve these necessary tradeoffs. (NRC, 2012). I have attached some of the power point slides developed to describe the framework developed to promote sustainability at the US Environmental Protection Agency.

We began by recognizing that the challenges of today increasingly require working across the usual stovepipes that limit efficient response to wide-ranging multi-causal problems. We also recognized that there were many good examples of sustainable actions that provided social, economic and environmental benefits. Our approach to define sustainability was to point out that all of the constituent parts of sustainability are present in America's founding environmental law, NEPA, which was signed by President Nixon in 1969 – although the word sustainability had not yet been used in an environmental context. We learned much from the actions of major US and global industries in approaching sustainability as an economically viable and even necessary component of competition in the 21st century (see, for example, ICCA 2012). The resultant framework, shown in the attached figures, has a major emphasis on metrics without which we cannot understand whether we have made progress, and without which we cannot make the difficult choices among the many competing possibilities implicit in tradeoffs among competing interests. We also emphasize the need to develop tools that are capable of informing decisions made by Congress and regulatory agencies. With the development of these tools we anticipate that the questions raised by the Subcommittee can be answered in a way that benefits the American environment as well as providing health and economic benefits

Conclusion

When I prepare my course lectures I often imagine how the classes I teach now will be taught decades from now. My guess is that the first slide on the history of environmental policy will start with Command and Control beginning in 1970; Risk Assessment and Risk Management beginning in 1990; and Sustainability beginning in 2015. In each case the process actually was gathering steam before the date. As we describe in our NRC report on Sustainability at EPA, there are many examples in which sustainability practices are already under way, in which EPA and other agencies have learned to maximize benefits while minimizing risks by taking into account economic, social and environmental issues. It is also clear that the policy tools based on Command and Control and on Risk Assessment and Management will inevitably need to continue into the distant future. As we look back and see how these tools developed, it is apparent that the dates they began could have been earlier or later, depending upon the willingness of the American people and of Congress to accept and utilize these valuable tools. But we now have no choice. If we are to prosper as a nation, if we are to protect the health and well-being of Americans from the broad range of environmental hazards, we must move quickly to develop and adopt the thinking and tools of sustainability.

Finally, we today either can be optimistic about how far we have gone; or pessimistic about the challenges of the future. Classically, optimism and pessimism is defined in terms of whether we see the glass as half full or half empty. For a sustainable future, we must consider the glass to be twice the size it needs to be. EPA must be given a robust role if we are to right size this glass for the benefit of our health, our well-being and our ability as a nation to respond to future challenges

Thank you

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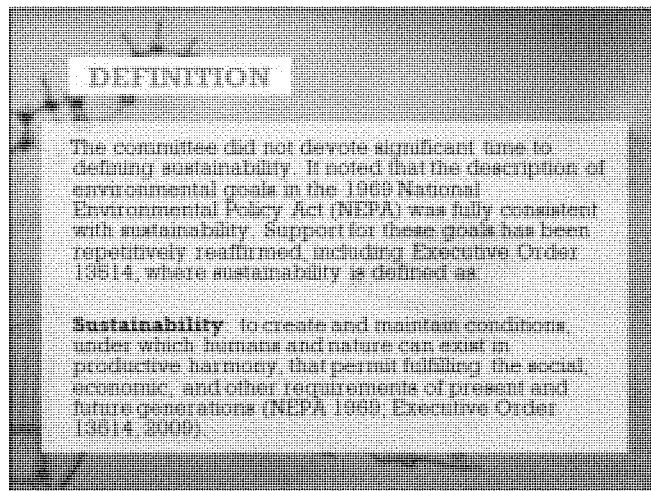
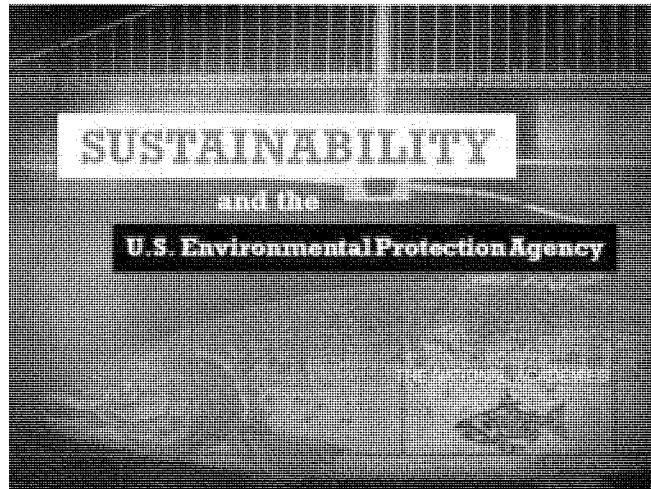
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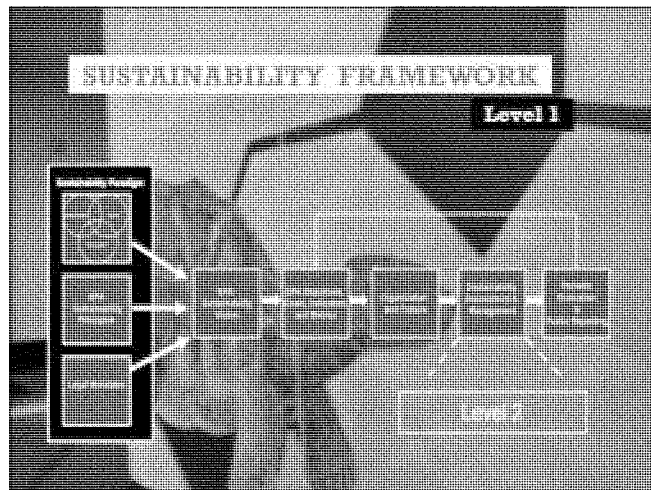
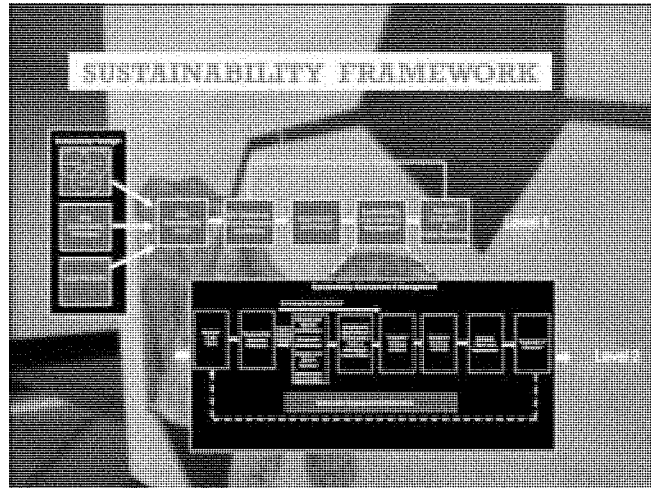
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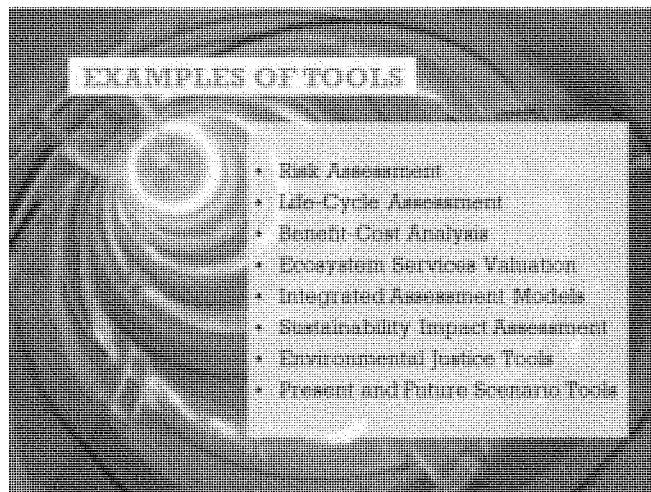
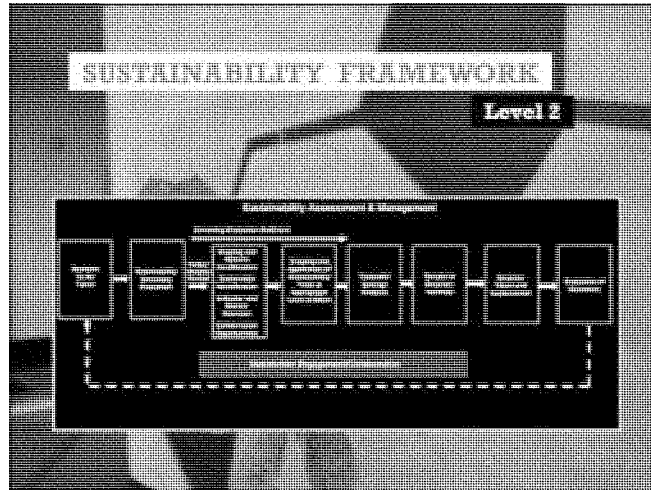
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TRADEOFF AND SYNERGY ANALYSIS

- Trade-off and synergy – key element of SAM
- The objective is to maximize synergies (social, environmental, and economic benefits of a decision) and to minimize the adverse effects of conflicts among the three pillars
- Important for EPA to establish a systematic way to analyze and quantify alternatives
 - e.g., spatially explicit models of multiple ecosystem services and biodiversity, Polasky, 2011
- Analysis can be used to identify new strategies that may improve results for key objectives

SUMMARY

- Overall management system framework for sustainability for the U.S. Environmental Protection Agency
- Approach driven by sustainability principles and goals and involves setting, meeting and reporting on measurable performance objectives
- Sustainability Assessment and Management (SAM) component incorporates sustainability into individual EPA decisions and actions

BERNARD D. GOLDSTEIN, M.D.

Dr. Goldstein is Professor Emeritus of Environmental and Occupational Health and Dean Emeritus of the University of Pittsburgh Graduate School of Public Health. He is a physician, board certified in Internal Medicine, Hematology and in Toxicology. Dr Goldstein is author of over 150 publications in the peer-reviewed literature, as well as numerous reviews related to environmental health. He is an elected member of the National Academies of Science Institute of Medicine and of the American Society for Clinical Investigation. His experience includes appointment as Assistant Administrator for Research and Development of the U.S. Environmental Protection Agency, 1983-1985. Before coming to the University of Pittsburgh in 2001 he had been the founding director of the Environmental and Occupational Health Sciences Institute, a joint program of Rutgers University and Robert Wood Johnson Medical School. He has chaired more than a dozen National Research Council (NRC) and IOM committees primarily related to environmental health issues.. He has been president of the Society for Risk Analysis, Chair of the National Board of Public Health Examiners, and has served as a member or chairperson of numerous national and international scientific committees, including chairperson of the NIH Toxicology Study Section, EPA's Clean Air Scientific Advisory Committee and the Research Committee of the Health Effects Institute. His recent work is primarily on health issues related to unconventional gas drilling, and on sustainability.

Chairman HARRIS. Thank you very much, and I want to thank all the witnesses for testifying. We are going to start the questioning, and I will start the round of questioning with myself. I recognize myself for five minutes for questions.

And again, thank you all because I think you all addressed exactly what we need to address, which is look, where have we gone and what it is going to cost us to go further. A recent EPA report entitled "America's Children and the Environment" found that a number of health hazards affecting children have declined including lead concentration, tobacco smoke exposure, children living in places that don't meet National Ambient Air Quality Standards, but the report also noted, concurrent with this decline, you have an increase in the rates of childhood asthma, and I know asthma was mentioned as one of the maybe chronic asthma may have gone down but childhood asthma has gone up despite these improvements. ADHD, autism, these have gone up. I am not sure these have environmental causes. We have new information all the time, because they are complex.

But does the EPA have a credible scientific basis to claim that further regulations, and again, as we go on further with regulations, they are going to be more expensive as we go on, we have kind of done all the things that don't cost very much to claim that further regulations will reduce asthma, which has been claimed all along for all the regulations that were put in place, so despite the regulations that we put in place, asthma has increased, when the record shows that again childhood asthma is increasing despite what we have done. Do we really have the data, the scientific data, and I will ask you first, Dr. Goldstein, as you suggest we need rigorous scientific data. We may know associations, but as you know and I know, associations are not causes. They are associations. Do we have the data on childhood asthma?

Dr. GOLDSTEIN. I think we do. Let me go back to a study that we did in New Jersey—

Chairman HARRIS. Let me just ask you then, if you think we have it, why has it gone up despite improvement in air quality?

Dr. GOLDSTEIN. Well, again, the study we did in New Jersey, we were able to clearly identify that ozone was associated with emergency room admissions for asthma and explained eight percent of the variability. So if you are dealing with eight percent of the variability, 92 percent is due to other things. You can cut that in half, and so many other things are happening with asthma including changes in our diagnostic criteria and whatnot, you are not going to see that in these big, broader trends but you will have, as we have, clear evidence that ozone is associated with childhood asthma, particularly during the summertime months when it is increased. So eight percent of total asthma is important and is a public health hazard that should be dealt with.

Chairman HARRIS. But as we have improved ozone, why hasn't childhood asthma gotten better?

Dr. GOLDSTEIN. Well, again, sir, if you went from eight percent to four percent, you change from 100 percent to 96 percent in something that isn't very stable, that is going up and down because of physicians' change in diagnosis, change in pattern. I don't think that is a fair comparison.

Chairman HARRIS. Okay. Ms. White?

Ms. WHITE. I am not a scientist but I have learned that there are a number of studies——

Chairman HARRIS. Can you put your microphone on, please?

Ms. WHITE. There are a number of studies which confound the association that Dr. Goldstein speaks about in terms—indeed, that show higher emergency room visits for asthma in the winter than the summer when ozone levels are drastically lower.

Chairman HARRIS. Sure. And again, it is clearly a very complicated thing, and the problem is, is that we have testimony coming in that says we are going to save these hundreds of billions of dollars on childhood asthma when in fact I don't think there is very good evidence that we know what the real causes are, the complex interactions, and it seems we are going to spend a lot of money when we don't have hard evidence.

Now, Dr. Goldstein, you previously served as the head of EPA's Office of Research and Development, served for a number of years on the Independent Science Advisory Board, and your testimony even mentioned the American Cancer Society cohort studies that have provided the basis for nearly all the Clean Air Act regulations in the last few years. Do you agree with the principle that the EPA should not be basing major regulatory decisions on science or data that is not publicly available, or phrased another way, shouldn't the EPA be making all this data publicly available if they are going to base major regulatory actions?

Dr. GOLDSTEIN. It depends what you mean by publicly available. Certainly the peer-reviewed literature should be available and should be shown. If you are talking about the raw data——

Chairman HARRIS. Well, we have had issues about peer review here in front of the Committee so, you know, peer review is the eyes of the beholder who appear. As I know, I have been a peer reviewer, as you have been. Do you think it is not unreasonable to say if a major regulatory action is promulgated, that we should have access to the raw data?

Dr. GOLDSTEIN. Sir, I would——

Chairman HARRIS. Most of these studies are federally funded so I am not sure what the reticence would be.

Dr. GOLDSTEIN. I would strongly oppose having the requirement that raw data on something that is peer-reviewed be——

Chairman HARRIS. Thank you. My time is limited.

Ms. White?

Ms. WHITE. I think of course it should because of all kinds of reasons to look at it because of the extent to which the EPA's use of that data in the study to found regulatory decision of national consequence and they rely very heavily on those two main cohorts, Pope and Laden, and actually dismiss toxicological studies that show a very different outcome.

Chairman HARRIS. Sure. I imagine just as the FDA requires seeing the actual data.

Mr. Trzupke, should the EPA release the data or make it publicly available?

Mr. TRZUPEK. From my perspective, yes, of course, especially since my clients are required to be as transparent as humanly possible. I think at a minimum, the EPA should be required to——

Chairman HARRIS. And most of your clients, I take it, aren't federally funded?

Mr. TRZUPEK. That is correct.

Chairman HARRIS. Okay, whereas the studies are. Thank you.

Ms. Bonamici, you are recognized for five minutes for questions.

Ms. BONAMICI. Thank you very much, Mr. Chairman. Thank you all for your testimony.

Dr. Goldstein, in your testimony you mentioned, and I quote, "the consequences to the American public of our delay in addressing the important issue of climate change," and you stated "but the threshold for action should not be the overwhelming evidence that is already in place; the threshold should be sufficient evidence to take out an insurance policy to protect the American public, a threshold level that we passed a long time ago." And you go on to discuss the three levels of prevention: primary, to cut back on the causes of greenhouse gas emissions, secondary, to prepare to mitigate the consequences when they occur, and then you added that we want to avoid the tertiary prevention such as paying billions of dollars to help clean up after extreme storms. So we have heard a lot about cost-benefit analysis in this hearing, so will you please discuss and expand on why it is important to consider the costs of all three levels of prevention you mentioned in your testimony when weighing the costs and benefits of environmental regulation?

Dr. GOLDSTEIN. Thank you. What I have said about an insurance policy is basically what Mayor Bloomberg said after Hurricane Sandy and what the insurance industry has been saying for quite some time. The insurance industry is now requiring people to consider, as they give out insurance, to consider potential issues related to greenhouse gas. There is no question that it is occurring and there is no question that we need to look at it.

Primary prevention is always the best. We have lots of economic figures. I have always been amused by the fact that they usually come out with a 16 to 1 ratio, which is equivalent to an ounce of prevention is worth a pound of cure. We need to be able to prevent and we need to prevent by basically cutting down on greenhouse gas emissions in a way that is cost-effective. We can do it, we should be doing it but we need to really push hard to make it happen, and Congress needs to be involved.

Secondly, we need to improve the resilience of our communities. We need to be able to be responsive to these issues. I chair a piece of the BP settlement, which at the request of the BP lawyers and the plaintiffs' lawyers that is providing—it is the Gulf Region Health Outreach Program, which is aimed at improving resilience on the assumption that there is going to be another major disaster in there and the community and the physicians and everyone else should know better to be able to deal with this. These are the kind of efforts that we need, but we shouldn't have to wait for a major disaster to cause litigation to fund it. We need to be able to build resilience now so that people can respond.

Ms. BONAMICI. Thank you very much.

Mr. Trzupke and Mrs. White, you both have been on the regulatory side of environmental issues for a long time and you both suggest in your testimony that the regulations that EPA is currently pursuing are onerous, not shown to yield many benefits, and

both of you assert in one form or another that the EPA may be exaggerating some of the health benefits and basically incorrectly evaluating the value of statistical life and health benefits. So I wonder if you could consider the high cost of health care in this country and the impact that that has on our deficit. Won't the cost of reducing air and water pollution yield savings to the health care sector and save this country money?

Ms. WHITE. I would be happy to respond. If you conclude, as I do, after an attempt to really scour how EPA builds their cost-benefit analyses, if you believe that they are imputing health risks at levels so low, way below the National Ambient Air Quality Standards, that there are probably not any measurable health benefits. Then the cost is not justified. And I give you an example. From the mercury rule, Utility MACT, as it is often known, EPA has acknowledged that it is probably the most expensive rule, single rule, that they have adopted to date, something like that I believe at adoption—at proposal they said it would be \$11 billion in compliance costs, and adoption, I think they took that down to 10.6 or something like that. When you look in the Federal Register, not interpretation, but you look at the numbers where they get very technical, EPA acknowledges that .004 percent of what they calculate as benefit come from reduction of mercury and the others, all the other, which is, what, 99 plus plus plus, come from coincidental benefits from reducing fine particulate matter. Then I don't see how—what EPA calls the most expensive rule to date, which the National Electric Reliability Commission and others have said has most risk of electric reliability across the country because of the rule may lead to a rapid closure of a significant part of the older coal-fired power plants, then to me, the costs far outweigh the benefits.

Ms. BONAMICI. And I am afraid my time has expired, so if I could ask Mr. Trzupek to respond perhaps in writing?

Chairman HARRIS. We will probably have a second round of questions.

Ms. BONAMICI. Thank you, Mr. Chair.

Chairman HARRIS. Thank you.

I now recognize the gentleman from Utah, Mr. Stewart, the Vice Chairman.

Mr. STEWART. Thank you, Mr. Chairman.

Thank you for taking the time to be with us today, Mr. Trzupek. I am envious that you will get off your Valentine's with only a simple dinner. I am afraid mine will be much more expensive than that.

I am a former Air Force pilot. I would like to come at this at a 30,000-foot level, if we could. I actually would love to talk to you about the relationship between state and federal regulators. That was my original intent here. But I would like to follow up on Ms. Bonamici's question and re-attack this, if we could, again from a very broad perspective.

I think most of us recognize that in a perfect world, we would be able to live without any environmental impacts at all, that we wouldn't contribute to those, that we wouldn't have any negative impacts, but of course, the real world, that is not the case. There is a tradeoff between our economic vitality between our way of life

that we have come to expect and the great benefits of that and the environmental impacts of that. So the question I have, and of course, the great challenge that we have is balancing these trade-offs between the economic and the environmental impacts, and I would like to ask you again in a big-picture sort of way, do you think we do a very good job at that, measuring the true economic impacts? Dr. Goldstein, you talked about the insurance. Well, if you have a \$100,000 house, but it costs you \$150,000 to insure that house, what is the true benefit of doing that? So do you think we do a good job of looking at the economic impacts? Has it become overly politicized, and ultimately, how can we do better at that? And Ms. White, could we start with you then?

Ms. WHITE. I don't think we do a very good job of that, and it is difficult to do. I think specifically in estimating costs, there should be a broader number of variables other than just compliance costs. But even more, I think we do a poor job of evaluating the benefits because ultimately when EPA promulgates a regulation, they are making a decision about unacceptable risk, which has so many different parts of it. Science, of course, is primary but science cannot give you a transparent point at which risk is acceptable. That to me is really a policy decision, and I think when Congress made those decisions—there is parts of the Clean Air Act that are very specific, and that is, I think, how we got lead virtually eliminated, the incredible success of the acid-rain program. That was when there were more prescriptive terms in the statute that bound EPA, that was the result of very heated debates by our elected representatives but they set implicitly or explicitly that risk level, and I think that is very, very important as in my judgment, the regulations that EPA is promulgating over the last four years have a measurably higher cost.

Mr. STEWART. Mr. Trzupek?

Mr. TRZUPEK. I think there are two things. One, all of the costs, benefits that the EPA claims are spreadsheet costs. They are theoretical costs. Nobody can put a witness in front of you who says my life was saved because I had one less microgram per meter of fine particulate ingested in my body. It is all on paper. The other thing is, it does not—none of these cost-benefit analysis factors in lost opportunity costs. There are great swaths of our industrial sector that have virtually disappeared from this country, not solely because of the EPA regulations but in large part because of them. We sell, for example, state-of-the-art, cleanest, most efficient coal boilers in the world to China but we don't build them here, we don't install them here. We don't have that industry burgeoning here, which makes no sense for the environment or the economy, and there is many, many examples of that.

Mr. STEWART. Yes, sir?

Dr. GOLDSTEIN. Well, looking at it as a non-economist, I look at this from the point of view of what kind of numbers are coming that are believable and not believable. So what we have got is a number of 230,000 over 30 years as pointed out by Ms. White as being something that she doesn't believe. She feels it is an overestimate of what the fine particulates is responsible for deaths, 230,000 over 30 years. Ms. White has told you that benzene is a major problem. I have published over 100 papers on benzene. Yes,

I like to hear that. But Ms. White, using the same methodology, EPA has looked under section whatever of the Clean Air Act as required to do cost-benefit, did the same methodology for cost-benefit on benzene, looked specifically at the Houston area because of all the great things that have been done there of how many lives have been saved over that 30-year period. We have heard from Mr. Trzupsek that EPA likes to exaggerate, so what number did they come up with? They came up with three: three lives over 30 years using the same methodology, going through the same science advisory board that basically beats the hell out of them each time about are you doing this right, and they came up with three. So frankly, they are not exaggerating. They can't possibly have come up with three for them and for Houston and for 230,000 probably work out to 3,000 lives would be their estimate for there. You have got 1,000-fold difference and yet you are saying that we ought to focus on benzene, which I would like to see, but also we want to focus on benzene rather than on fine particles? Makes no sense at all.

Mr. STEWART. Doctor, if I could, just very quickly in 5 seconds, I am assuming from your answer that you believe that they do do a good job of evaluating those economic impacts?

Dr. GOLDSTEIN. I do believe—I don't believe the number 230,000. I don't know whether to believe it or not, but I do believe that it is a lot bigger than the benzene number, and I do believe that one cannot accuse EPA of routinely overestimating if it says that for a 30-year period or equivalent to a 30-year period for the entire Houston-Galveston area three lives were saved from its benzene actions when that is using exactly the same methodology that it has used for fine particles.

Mr. STEWART. Mr. Chairman, I yield back. Thank you.

Chairman HARRIS. Thank you very much.

I now recognize my colleague from Maryland, Ms. Edwards.

Ms. EDWARDS. Thank you, Mr. Chairman, and to the Ranking Member, and also thank you to our witnesses.

You know, I said I read all of your testimony, and I will just say for the record, I am a proud member of the Sierra Club. I was on the board of the League of Conservation Voters, both in Maryland and nationally. I love the work of the National Resources Defense Council. I worked with the Chesapeake Bay Foundation. I care deeply and passionately about my environment, and not because of a prophet of doom, not because I am a socialist, not because I am an alarmist or an extremist, not because I shriek, not because I am ecoradical or a hysterical enviro type, and not because I am part of a green tyranny, and so I would hope that we could actually have a conversation about the environment and the importance of the government's role in regulating our environment for our clean air and our clean water because people like me who have been advocates for our environment come from it because we are concerned citizens in our community.

I look at the work that I have done over the years living in the metropolitan Washington area that is not anywhere near my colleague's district on the Eastern Shore and yet I care deeply about protecting our Chesapeake Bay from stormwater runoff that is created here in the metropolitan area because we have such huge impacts. Now, that doesn't impact my community but it does impact

my state where hundreds of thousands of jobs are at risk, where our bay could have been dead had it not been for the great work of the Environmental Protection Agency and our state in making sure that we preserve and protect our bay, and where billions of dollars of commercial interests are at stake if we don't protect that bay for jobs and our overall economy. And so I hope we can get way from the name calling and really focus truly on what it is going to take from all of us in business, industry, in the private sector, in our federal and state governments and our local communities to preserve and protect our environment, to clean our air and our water.

When I was a young working mother, I caught a bus on the side of a road, a highway, and every day I would stand there with my son in a stroller while the emissions were pouring out of every single vehicle going across the highway, so do I think it is a great idea that those emissions are now regulated, that our air is getting cleaner? It is not quite there yet. Do I think it is a good idea that we have made investments in clean fuel transportation so that people like me, young moms standing on the side of the road to catch a bus, are they and their children breathing in that air? Absolutely I do, and the role of the Federal Government is to make sure that it protects citizens like me.

And so with that, I want to ask Mr. Trzupek a couple of questions. In your testimony, you stated that the environmental industry agree that we are at a crossroads but solutions operate at two extremes. You state further that if you don't support new environmental initiatives and every new EPA program, then you therefore support a return to the bad old days of unlimited, unrestrained ecological damage. What exactly is the other extreme of that argument that you posit, and have you heard such an argument ever presented in this Committee or this Congress?

Mr. TRZUPEK. By this Committee and this Congress, no, and I believe I qualified that statement, that there are certain environmental extremists who are invested in this kind of culture of doom and that that is the message that we hear, I hear from that end of the spectrum.

Ms. EDWARDS. And so who are those people exactly?

Mr. TRZUPEK. Who are those people?

Ms. EDWARDS. Yes.

Mr. TRZUPEK. I hear that from environmental activist groups. I have heard that from Sierra Club members. I have had that debate with the Illinois chapter of the Sierra Club. I have heard that from NRDC and others.

Ms. EDWARDS. Well, as I said, I mean, I am a member of one of those groups and I am neither an extremist or an alarmist but I am concerned about our environment.

Also in your testimony, as you said, you have provided a fair amount of criticism to the Sierra Club, the NRDC, researchers, academia and industry. You said that, "the relevance depends on them discovering, quantifying and publicizing sources of risk." Do you think that they are making it up?

Mr. TRZUPEK. I think they are vastly exaggerating it. We live in a world of risk. There is risk associated with the emissions from our own breath. You can find a few parts per billion the pollutants

that people would say that is a carcinogen in your own breath. I think it is the magnitude of risk that is routinely exaggerated.

Ms. EDWARDS. Well, I mean, what you have just described is actually way more extreme than I have ever heard in any of my Sierra Club meetings. You have also stated that it is the advantage of some commercial sectors to create a climate of fear. What do you mean by that?

Mr. TRZUPEK. I mean that there are people, and you will see the commercials like for example, an indoor air purifier that uses ozone to purify the indoor air, the very pollutant that Dr. Goldstein and others have said we need to protect ourselves from, and—but people sell those kind of products, taking advantage of that kind of climate of fear, that your air is bad inside so you need this protect.

Ms. EDWARDS. I know my time has expired. Can you just tell me your scientific background and your scientific research background that qualifies you to make those statements?

Mr. TRZUPEK. I am a chemist. I don't have a scientific research background, and my experience has wholly been in the field of air quality for the past 30 years. I have participated in EPA committees. I have taught a number of classes at different universities and for different organizations.

Ms. EDWARDS. And for the record, you have also challenged climate science as pseudoscience but you haven't done any climate science research, right?

Mr. TRZUPEK. I haven't done any climate science research.

Ms. EDWARDS. Thank you.

Chairman HARRIS. Thank you very much.

I now recognize Mr. Weber for 5 minutes.

Mr. WEBER. Thank you, Mr. Chairman. Kathleen, good to see you.

A quick question for each three of you. Is it possible to have too much clean air or clean water?

Ms. WHITE. That is often said, why do we worry about regulation because you can't be clean enough. In a perfect world, if we were not constrained by space, time and resources, that would be true, but I find human life is—and my father used to say nobody gets out of this alive—is fraught with dangers and all kinds of risks that we make all kinds of decisions about. I think when—again, what I call the most robust sciences that can really demonstrate causation, the impact of a certain pollutant level on the way the lungs and heart work. When that is absent from the manner in which EPA sets regulatory limits or calculates benefits, and I will give you an example, and we have talked on and off and we have been answering questions about fine particulate matter. EPA gets to this number of 230,000, if that was the number, Dr. Goldstein, lives at risk of early deaths, the phrase they use, by going way below the National Ambient Air Quality Standards by law the Clean Air Act requires those are set to protect public health with a margin of safety regardless of benefit, very conservative standards as they are stipulated in federal law. EPA finds risks way below that in these epidemiological studies that show a correlation between a change in death rate and a fine particulate matter level way below that lowest measure of the study down to zero, and when they did that, what statisticians call extrapolation, you go

from where you have data, you assume, well, if I have it here, I bet that goes to the unknown, that increased the number of so-called early deaths from 88,000 fourfold to 320,000. That I do not think justifies regulation that impacts the whole economy.

Mr. WEBER. So Mr. Trzupsek, I will get you to weigh in on it. Let me ask the question this way. It is probably not possible to have too much clean air and too much clean water but it is possible to have too much or too many regulations which negatively impact our productivity in such a way that the benefits are far outweighed by the costs. Would you agree with that?

Mr. TRZUPEK. I would. At some point you hit a point of diminishing returns. Since we are talking fine particulate, I will highlight the recent boiler MACT regs that were finalized by EPA, which affect industrial boilers. Fine particulate reduction attributable to boiler MACT is 0.3 percent of all the fine particulate yet we hear what a massive benefit this would be. Well, if that is true, the majority of fine particulate in the air, according to EPA's own data, the vast majority comes from what they call miscellaneous sources. Those are non-transportation, non-industrial sources. Those are natural sources and consumer products and everything else. Well, if that .3 percent reduction is really as incredibly worth it as EPA says, we should go after that 96-plus percent from natural and other sources, and obviously we are not going to do that. That makes no sense. We have gotten all the low-hanging fruit, and there is very little point for going for those things that have such a monumentally small benefit.

Mr. WEBER. Thank you, and I will ask you the same, Dr. Goldstein.

Dr. GOLDSTEIN. I think Ms. White basically has given the answer. Eighty-eight thousand deaths above the threshold is a very major public health problem. We have to meet that problem. But of course, sir, there is certainly no need to get the very last molecule of benzene out of the air. We can have one molecule.

Mr. WEBER. So you can have overregulation?

Dr. GOLDSTEIN. Of course.

Mr. WEBER. The best way to have a perfect clean air and water in the world, you talked about, Kathleen, was maybe to move to the Pacific Ocean on an island. Now, your quality of life may be really reduced but you will have perfect clean air and clean water.

You know, in Texas, we have got 1,300 people a day moving there. I think they are voting with their feet. We have done a good job of cleaning up our air and water, and Kathleen White would know that firsthand. We believe that the TCEQ, our environmental regulatory agency, the second largest one in the world, who was proactive—actually, it was train wreck, or TNR—

Ms. WHITE. TNRCC.

Mr. WEBER. TNRCC, we called it, Texas Natural Resource Conservation Commission, and then the Texas Water Quality Board before that back in the 1960s, was it, Kathleen, 1970s?

Ms. WHITE. Sixties—well, and this is a state issue, but the legislature combined our health and human services agency with the water agency.

Mr. WEBER. So we were environmentally friendly. What is that old country and western song? "I Was Country before Country Was

Cool"? Texas was actually environmentally friendly before it was fashionable, before being green was fashionable.

Ms. WHITE. We had a state clean air act before the federal clean air act.

Mr. WEBER. And our economy shows that. Thank you very much. I yield back.

Chairman HARRIS. Thank you very much, Mr. Weber, and we have time, I think, for a second round of questions, and I will open that second round and recognize myself for five minutes for that.

Ms. White and Mr. Trzupek, an important check or important checks on EPA science are independent scientific advisory panels like the agency's Science Advisory Board and the Clean Air Scientific Advisory Committee. In your view, are these bodies independent and objective? Because obviously we want to have independent, objective bodies, panels reviewing data before we come up with costly regulations. Are they?

Ms. WHITE. It is very difficult for anyone to be 100 percent objective, but from what I have learned on many of these panels, unfortunately, the majority, if not all of them, sometimes derive a significant portion of their income or almost all of their income or the institute at which they work from EPA studies, and so it seems to be—in fact I think on some of those panels, people from a state like me would love to see like state regulators and a much broader group from that and also people from more diverse scientific disciplines, which has also been recommended by the National Academy of Science.

Chairman HARRIS. Mr. Trzupek?

Mr. TRZUPEK. I would agree. From my perspective, everybody has their own particular blinkers on, and I would include myself. We all do. But in my opinion, CASAC especially is very heavily weighted on the academic, environmental advocate side with very little checks in CASAC on that particular perspective, and I would like to see them particularly reformed.

Chairman HARRIS. Dr. Goldstein, you have helped to appoint and serve on these scientific advisory bodies, and my observation in medicine is not every good doctor is in an academic institute. Some actually are in private fields and they bring something to the table there and they add to the subject, so would you object to the inclusion of qualified scientists or more qualified scientists from the private sector serving on these panels addressing Ms. White's complaint that it appears there is a little inbreeding going on?

Dr. GOLDSTEIN. Yes, as long as I can qualify it by saying that Ms. White is, I think absolutely wrong by saying that the EPA is funding most of these scientists if the majority of the funding comes from EPA. I think the head of Research and Development at EPA would love to have the kind of funding hat would allow them to give the majority to CASAC members. In fact, CASAC's members are folks who are funded to a large extent by the—to the extent that they are academic, by the National Institutes of Health and others.

I will tell you that CASAC, at least when I chaired it, had a requirement from Congress that it have at least one of its seven members be a state official involved with air pollution and another be a physician.

Chairman HARRIS. What about particularly private sector?

Dr. GOLDSTEIN. I don't think there is a requirement for private sector——

Chairman HARRIS. Do you think that there ought to be?

Dr. GOLDSTEIN. I don't know if there should be a requirement but we always had someone from the private sector on there, and I would strongly support that.

Chairman HARRIS. Let me ask you two follow-up questions, something we have heard before, because the question was, well, are they radical environmentalists who propose some of things. Well, look, we had Josh Fox in his hearing room, who published Gasland. Dr. Goldstein, you are laughing. I am going to ask you, have you reviewed the EPA findings on Pavillion and Parker County and Dimock and all the rest? I mean, they come back and say basically there is no scientific basis for saying what we have said, walking it back. Do you think there is a sound scientific basis for their initial findings at Pavillion? I don't know, you may not have read the report and it may not be a fair question. Have you read the report?

Dr. GOLDSTEIN. Not the final report.

Chairman HARRIS. Okay, because it has a lot of benzene mentioned in it actually. But, when we talk about the huge costs of going to the next step in some of the Clean Air Act requirements and regulations, the \$10 billion cost mentioned for the mercury rule, you know, the opportunity costs that Mr. Trzupek mentions are true because if we take those \$10 billion instead of investing it in that, we invest it in research to address why childhood asthma, you know, what are those other 96 percent or 94 percent, I mean, what is the real cause, it is very complicated. I mean, we could boost the NIH research budget 20-fold probably for asthma or maybe 40-fold. I don't know. There is an opportunity cost loss when we decide that we are going to go down one pathway to regulate and spend and not use that money to perhaps more carefully define a complex scientific basis for solving our air and water quality. What do you think, Dr. Goldstein?

Dr. GOLDSTEIN. Well, I agree with you up to the point of saying that first of all from the 1960s since I have been involved in it, I have heard over and over again these same arguments and then industry retreats from them, as it turns out that in fact they can do it at far less cost. And second of all, I have yet to see an example where Congress has moved money from one separate branch that is controlled by one committee to another branch. I have yet to see that kind of thing happen that you described.

Chairman HARRIS. That is a valid argument, very valid.

I recognize Ms. Bonamici.

Ms. BONAMICI. Thank you very much, Mr. Chairman.

We had a lot of discussion about the role of industry in developing innovative technologies to reduce emissions, and I know, Ms. White, in your testimony you talked about prosperity and the importance of prosperity and how Los Angeles did a better job than China. I just wanted to suggest that perhaps that is because we do have strong environmental laws and regulations that motivate that innovation.

I wanted to ask Dr. Goldstein to follow up a little bit about lead because Ms. White said a couple of times that lead has been virtually eliminated, and I wanted you to discuss the studies about that and also isn't there still work to be done?

Dr. GOLDSTEIN. Well, yeah, "virtually eliminated" is simply too strong a term, I think, for what happens still in communities that have a lot of lead burden in their homes. Again, as a teacher, when I teach about environmental justice, I usually make the point that if something that was affecting the IQ of America's children was built into, say, suburban housing post war, say, the Formica tops, the tables, we would have gotten all that out by now. We haven't done that with the lead yet, and we still have homes with lots of lead. We still have kids who are affected. We have—I put in my testimony HUD's cost-benefit analysis of the tremendous value of taking the lead out of childhood homes. We simply haven't done it yet. So to say it is virtually eliminated, that is true for me, but it is not true for important segments of our population.

Ms. BONAMICI. And just to follow up, how much certainty was there in the science about reducing lead in the 1970s when the studies began?

Dr. GOLDSTEIN. Well, in the 1970s and the 1980s, people have forgotten that the Reagan Administration took the last lead out and was based on a cost-benefit analysis that OMB bought and that it was costing more to have lead in than before, and that is at a time that CDC did not have as stringent a requirement as it has now based upon the new data. So that the lead issue, we were late on that as we have been late on a lot of these issues that we recognize now were causing significant adverse effects as I think I have testified that we are late on the global climate issues as well.

Ms. BONAMICI. Thank you. I yield back, Mr. Chair.

Chairman HARRIS. Thank you very much.

I recognize the gentleman from Texas, Mr. Smith.

Chairman SMITH. Thank you, Mr. Chairman.

Mr. Chairman, when you gave your opening statement, I like your turn of phrase, "the greatest story never told," and of course, you were referring to a number of ways in which the United States environmental metrics have been going the right direction. We still need to do better in a lot of areas but there is a lot of good news out there and sometimes that good news is ignored.

Ms. White, I guess I can say Director White or Commissioner White, I wanted to address my first question to you, and you went into more detail in your written statement and I think you mentioned water quality briefly in your oral statement, but I would like to go back and ask you if you feel that our water quality is important and how you can quantify that?

Ms. WHITE. And that is a difficult question. I think there is far better federal data on trends in air quality than there is in water quality, and for somewhat understandable reasons, I don't know what the extent of—how many hundreds of thousands of miles of every stream, small stream and then big river but there are a couple markers which I think again underlines a positive trend, a job not over, a regulatory job not over but very positive trends. We regulate public drinking water systems for, I think it is over 100 different contaminants, which is a good thing. We have very, very

safe, and I believe as far as the last data I saw from EPA, 94 percent of all the public water systems in this country have perfect compliance with all the standards.

Chairman SMITH. How does that compare to, say, five years ago or ten years ago?

Ms. WHITE. Ten years ago, I think it was something like 70 some were full compliant so there has been a 20 percent—

Chairman SMITH. Can you get me the data on that—

Ms. WHITE. I would be happy to.

Chairman SMITH. —compared to today's 94 percent compliance with, say, five years ago, ten years ago, whatever it might be? Again, I like the trend, which is encouraging. Okay. Thank you.

Mr. Trzupsek, I wanted to ask you about air quality. You mentioned that that has been improved. The EPA actually says there has been great progress, although they say almost half the American people live in counties where there is an unacceptable level of air pollution. I wonder if this is a situation where both statements are accurate or if you challenge the data that the EPA is using.

Mr. TRZUPEK. Well, that statement is possible only because of redefinition of the term "clean air." Over the last 40 years, there has been 18 instances where the EPA has looked at National Ambient Air Quality Standards. In 10 of those, they have either reduced the standard or added additional standards that effectively did the same thing. So when you say you have all of these counties where people are living with unhealthy air, it requires that continual redefinition to make that happen.

Chairman SMITH. Okay. Thank you.

And Mr. Goldstein, you mentioned, and we have heard about it many times recently including in the State of the Union address by the President, that several of the last few years are the warmest on record. Also, of course, if you look at the last 15 years or so, you see that the temperature has flatlined and has not gone up during that time despite predictions that it was going to do so. But my question to you is this, and I don't know the answer myself—I have asked it to a number of people and gotten a number of different answers. This goes to global warming, and to what factors do you attribute global warming? And if you can break it down as a percentage, that would be great too. You have human activity. You may have the influence of solar activity. You may have the influence or the historical cycles of temperatures going up and down, and of course, when we say it is the warmest on record, it depends on how far back you are going in the record too because it has been warmer before as well. But to what do you attribute global warming? Can you break it down and quantify it, or not break it down but give me what percentages is attributable to human, maybe to solar, it may be cyclical, or is it even possible to get to an answer?

Dr. GOLDSTEIN. Everything I read gives the overwhelming amount to humans. We have had, I think in the last—if you look at the temperature records in the United States from, I guess, we are well over 150 years now, we have got the 10 highest of those 150, nine of them are in the past decade and the other one was in the 1990s. Something is happening.

Chairman SMITH. Well, that is true but as Mr. Trzupek just pointed out, if you change the standards or the methodology, you might end up with different results than you would have otherwise.

But let me go back to my question again. Can you break down—I mean, you feel that most of it is attributable to human activity. Is it 51 percent, is it 91 percent? Does anybody know?

Dr. GOLDSTEIN. Sir, I am not sure. I do know that to the extent that it is due—if it is due at all to a natural cycle involving the sun, we can't do anything about that. To the extent that it is due to human activity, and it is a very large extent, then we can do something about that part, and so whether it is 83 percent or 72 percent or—

Chairman SMITH. Well, is the human contribution from the United States—everything I read is that it is below one percent, it may even below a half a percent. Is that generally accurate?

Dr. GOLDSTEIN. No, I don't think so at all, sir.

Chairman SMITH. What part of it would—

Dr. GOLDSTEIN. I would say I would not—I am not an expert on that, but the—

Chairman SMITH. So we don't know how much people in the United States contribute to global warming?

Dr. GOLDSTEIN. Well, by “we”, if you are asking me individually if I can tell you right now, the answer is I can't, but if I could go and look at the literature and look at what the various groups that have looked at this from, as I say, during President Reagan's day, the National Academy of Sciences in 1984. We can give you what is the range of—

Chairman SMITH. Like I said, I have read it is below one percent, but I will wait to see if you feel differently.

Dr. GOLDSTEIN. I would be happy to send—

Chairman SMITH. Your answer is you don't know right now?

Dr. GOLDSTEIN. I am willing to bet it is not one percent. I would be happy to review it and send you the materials, sir.

Chairman SMITH. Okay. Thank you.

Thank you, Mr. Chairman.

Chairman HARRIS. Thank you very much.

I recognize Mr. Stewart from Utah.

Mr. STEWART. Thank you, Mr. Chairman.

Once again, I would like to maybe shift gears just a little bit, a little bit of focus, and bring in some examples and then maybe a question from that. I have worked for many years in the energy sector in environmental consulting. Energy development, I think most of us would agree it is a wonderful thing for us on many levels. It has the potential to revolutionize our world both economically and from a national security perspective as well. In recent years, the EPA has taken a fairly aggressive approach to some of the technologies that have allowed us to take advantage of some of our resources and has initiated lawsuits that were quite troubling to many people and some of these accusations made in their environmental impacts, and then of course, in virtually all these cases with fracking, the courts have not sided with the EPA and have decided that the science that they had based that on was not reliable.

Another example of the point of my question is, Ms. Jackson has been quoted, and of course, this has created a lot of emotion for people, talking about some of the pollutants and the best advice—she said the best advice I can give you is don't go outside, don't breathe the air, it might kill you. These types of actions or public statements, again, people look to these people as leaders. They look to them as affecting public policy and they take seriously what they say. And I would ask you, do you think it harms public policy? Do you think it harms our confidence in these leaders, these environmental leadership when they take actions or when they make statements like this that create fear and concern in the public and yet prove not to be true?

Ms. WHITE. I say this from the perspective as a former chief of the state's large environmental agency. I think a fundamental responsibility in that job is to meaningfully, accurately communicate to the public and not to use a kind of rhetoric that invokes nothing but fear and people may credibly disagree about the degree of pollution and its impact on health and all of that, but you never, I don't think—to say it more appropriately, you rarely ever hear senior EPA officials try to communicate to the public the extent of the progress we have made, and again, not that we are finished with it, not that regulation does not play a role, but I think it is—I give you the example of mercury, which, as I think is a great concern to women who are having children or have young children because they are the most vulnerable, and when you have—again, it doesn't mean caution. It is an area where I would use the precautionary principle of course but when you have now like the Center for Disease Control study that shows in a national blood survey—again, they are never perfect but a national blood survey that the average levels are way below what is even the EPA's extremely strict standard. Those kind of things should be communicated to the public.

Mr. STEWART. Dr. Goldstein, understanding that there is some disagreement among the witnesses, and we respect that, perhaps some of us here. When you hear these types of statements or when you see these types of actions initiated through the courts, which are not borne out, does that make you cringe a little bit? Do you think it hurts the advocacy, or what is your reaction to that?

Dr. GOLDSTEIN. No question, we need to be based upon the best science and there is no question that there are bureaucratic things that are inappropriate. I can sit down over a drink and we can compare the U.S. EPA with my university as to which have the most bureaucratic inefficiencies built into it. So I don't doubt that you can reason by anecdote—

Mr. STEWART. You are going to have to buy a lot of drinks.

Dr. GOLDSTEIN. I have been to a lot of universities.

But, the issue of the EPA's aggressive approach on fracking, from where I sit in southwestern Pennsylvania, I don't see any slow-down whatsoever based on anything that the U.S. Environmental Protection Agency has done. So in terms of getting things right, I do not see the slightest bit of impact of the U.S. Environmental Protection Agency on how people are going about fracking except their concern that if they do it wrong, they are going to cause regulation to occur.

Mr. STEWART. Yeah, exactly, and I agree with you, and the concern wasn't the impacts because it turned out there wasn't reason to slow that. My biggest concern was the public perception and the public concern and fear that was created by some of their statements and some of the accusations that they had made.

Dr. GOLDSTEIN. Sir, we recently have a paper accepted for publication where we looked at what people were complaining of who believe that they have been adversely affected, and that is not an unbiased sample, but what are they complaining of and what is stressing them the most and 5, 10, 20 percent are saying they are being stressed by the noise, by seeing the trucks and whatnot. About 60, 80 percent, I don't remember the exact number, are saying they are being stressed by the fact that they think industry is lying to them. They think that things are being kept secret from them by industry. So we have got a situation in which—and I can tell you that the chemical industry folks that I speak to say that they think that the drilling industry and how they have gone about this, they are aghast at how poorly they have handled this. So what I see are people who believe that there is a problem because of what industry and state government is telling them, not because of what the federal government is saying.

Mr. STEWART. Thank you, Mr. Chairman.

Chairman HARRIS. Thank you very much.

I recognize Mr. Weber.

Mr. WEBER. I want to follow up on what Mr. Stewart said, Dr. Goldstein, and I know that Kathleen Hartnett White will remember this, and you may too. There was a Region 6 EPA administrator who made the statement that in dealing with industry, you do like the Romans do when they invaded a country, you crucify the first five and then the rest of them will fall in line. Do you think that hurts the credibility? Do you think that adds to the public's perception that something is very, very bad wrong in this country? Do you think that furthers EPA's, if you will, mandate? I hate to use that word.

Dr. GOLDSTEIN. No, sir, I do not.

Mr. WEBER. Okay. All right. Well, I am glad to get you on record as saying that.

Let me go back to my earlier comments about it is not possible to have too much clean air and clean water but we can overregulate and we can negatively impact our quality of life. You know, we have got a study, for example, that shows in China it is no news to anybody that they are growing leaps and bounds and they are manufacturing coal plant, coal facilities. I think it was Mr. Trzupek that said we manufacture that clean-air technology over here but then we export it to China. And China has on the drawing board over 500,000 megawatts of coal generation in the coming years, and of course, you can take it over to India which also has over 500,000 megawatts. You drop back to the United States, which has only 20,000. Do you really believe, Dr. Goldstein, that if we negatively impact our industry and we put stringent requirements on them that those countries abroad are going to follow suit?

Dr. GOLDSTEIN. I really don't know how to answer. I don't know what is going to happen. I do know that all of the studies that have been done in countries that have gone through rapid development,

for instance, in Korea, show that in retrospect, they would have preferred to have more environmental controls. It costs them more money.

Mr. WEBER. Let me—

Dr. GOLDSTEIN. Forget the health. It costs them more money.

Mr. WEBER. Let me help you. You can answer it yes or no. Do you believe they are going to follow suit? I think we would have to agree no, they are not going to follow suit. We are going to negatively impact our industry over in this country. Mexico is not going to follow suit. If you believe that those emissions waft over here from Mexico—I was on the environmental reg committee in the State of Texas and was aghast to hear some of the rules that the EPA was promulgating.

And Mr. Trzupek, I will direct this question to you. In the Texas legislature, we passed a bill that said before the TCEQ could promulgate rules on the industry, that they had to do what we would call an industry impact analysis to take into account. Would you think that would be good legislation on the federal level?

Mr. TRZUPEK. I think that would be excellent legislation on the federal level, and I think Texas's success and their remarkable economic growth and while protecting the environment, it is one of the best states for people in my business to do business in.

Mr. WEBER. You bet.

Mr. TRZUPEK. And I think that would be great to take to the federal level.

Mr. WEBER. Thank you.

And I will direct my last question to Ms. White. The EPA took over our flex permitting. Was that last year or the year before last? About two years ago.

Ms. WHITE. About two years ago.

Mr. WEBER. Can you explain that to our panel here, Ms. White?

Ms. WHITE. Okay, and I will try to do this very briefly, and this has to do with—in my testimony, what I think as far as priorities for moving forward is the importance of, as I said, more vigorous science but targeted regulation that does not go too far.

Texas developed a permitting program for major air emissions sources called the flexible permits, which gave the facility an emission cap for the whole facility instead of a cap on every emission point, which is EPA's traditional way of doing their major air quality permits called prevention of significant deterioration permits, and it was stricter as one standard but it enabled the operator to figure out how he was going to run that where maybe there were days he needed to ramp up—

Mr. WEBER. Some fluctuation?

Ms. WHITE. Yes, ramp up production, but monitors showed most of those big industries in Houston that reduced emissions were under flexible permits. After 15 years EPA had never formally approved it but they had never—

Mr. WEBER. And they were required bylaw to do that, were they not?

Ms. WHITE. And they were required by law. And in about 2009 or 2010, I think, they decided to disapprove it, and long story short, we legally challenged that decision and Texas prevailed. But here is the sad part of that. Many of those industries—because when

EPA disapproved it, it also sent a letter to 120 of our major industries that said you are out of compliance with the law being in compliance with the law, if you are out of compliance, you can't even operate. So most of those facilities deflexed. They went back and got a version which is actually the traditional, more shackling EPA permit, and we will see how that works out.

Just one last point that I think is a very interesting one. In reading all that I do about these issues, someone noted that EPA regulation, as it gets more and more complex and layers and layers, makes business operate like a bureaucracy. You're certifying your certification of your certification instead of really trying to run your business tight and efficient so you reduce emissions becomes what you have to do, and that might sound like just a general statement, but I think that is really—

Mr. WEBER. Scary.

Ms. WHITE. —scary, and how you design regulation, how you target, how you draw upon the creativity and motivation of the business owner to get the job done has, I think, greater environmental results.

Mr. WEBER. Thank you.

Thank you, Mr. Chairman.

Chairman HARRIS. Thank you, and I am going to recognize the Chairman of the Full Committee for a brief question.

Chairman SMITH. Thank you, Mr. Chairman.

Congressman Weber's questions remind me of a couple questions I would like to direct to Dr. Goldstein, and this goes to EPA regulations as well. Would you favor, Dr. Goldstein, the public release of the cost of regulations before they are actually implemented so the American people would know what the economic impact would be before they are actually put into effect?

Dr. GOLDSTEIN. Yes, very much so.

Chairman SMITH. Okay. Good. And secondly, if there were a number of ways to implement a regulation, would you favor implementing it in the least costly way possible if the same goal was achieved?

Dr. GOLDSTEIN. Yes, of course.

Chairman SMITH. Okay. Good. The Judiciary Committee in the House of Representatives last year passed two reg relief bills to do just what I described, and they were opposed by the Administration, and they seem to be commonsense approaches to regulations, and so I thank you for your support of them. Thank you, Mr. Chairman.

Chairman HARRIS. I thank you very much.

Before we close, I am going to recognize the Ranking Member for a request.

Ms. BONAMICI. Thank you very much, Mr. Chairman. It has been an interesting discussion. I am not certain that the testimony presents to the full extent of what I believe we were here to discuss, the state of the environment, especially the impacts on public health of certain environmental laws, so I will be reviewing the testimony and where appropriate may be noting for the record where I believe clarification or additional explanation should be made. Thank you, Mr. Chair.

Chairman HARRIS. Thank you, and I will reserve the right to object to inclusion of the material until my staff and I have had the time and opportunity to review it.

I want to thank the witnesses for their valuable testimony and the Members for their questions. The Members of the Subcommittee may have additional questions for you, and we will ask you to respond to those in writing. The record will remain open for two weeks for additional comments and written questions from Members.

The witnesses are excused and the hearing is adjourned.
[Whereupon, at 11:39 a.m., the Subcommittee was adjourned.]

Appendix I

ANSWERS TO POST-HEARING QUESTIONS

ANSWERS TO POST-HEARING QUESTIONS

Responses by The Honorable Kathleen Hartnett White

U.S. HOUSE OF REPRESENTATIVES

COMMITTEE ON SCIENCE, SPACE AND TECHNOLOGY

Subcommittee on Environment

Response to Hearing Questions on the Record

Questions from The Honorable Suzanne Bonamici

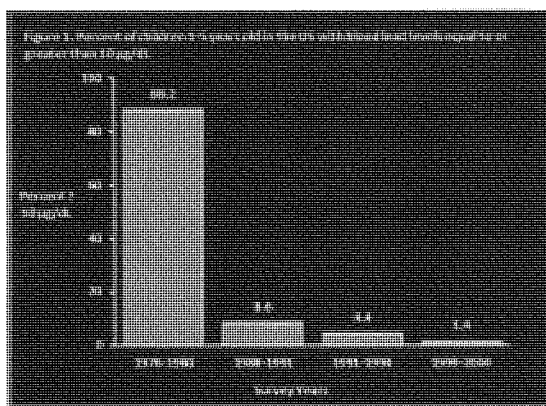
Response from The Honorable Kathleen Hartnett White

Hearing on The State of the Environment: Evaluation Progress and Priorities, 2/14/2013

Question 1. Do you agree that it would be inappropriate and unlawful for EPA to ignore advances in scientific understanding that would justify revising the lead standard or other air quality standard to protect public health with an adequate margin of safety?

Of course, the federal Clean Air Act (CAA) requires that EPA review the National Ambient Air Quality Standards for the six criteria pollutants every five years to determine if any advances in science warrant changing the standard. Thus, EPA would be violating the CAA if they did not conduct the review. Advances in science or in environmental condition, however could lead to strengthening, lowering or maintaining a current standard. While the exact lead standard that is “protective with an adequate margin of safety,” is debatable as the risks are inherently uncertain, the public health record of improvement related to lead is not. Clearly, blood lead measurements in children have shown dramatic decreases in the last 40 years, which would presumably have resulted in dramatic increases in children’s health and IQs during that same time.

Blood lead measurements in children have declined drastically since the 1970s, as shown in Figure 1 (Jones et al, 2009) which is the reason I mentioned that EPA could have “declared victory on lead” and left the current NAAQS for lead in place rather than lowering the NAAQS. My choice of words about declaring victory were clumsy and perhaps misleading. I in no way intended to imply that EPA should eliminate the lead NAAQS. But their review of scientific data about reduction of lead levels in the blood should have been a consideration. As noted below, these data document that the public health efforts to reduce the number of children with elevated blood lead levels in the general population continue to be successful. Of course, there still are children living in homes containing lead-based paint or lead-contaminated dust continue to have higher rates of elevated blood lead levels and remain a major public health concern (CDC, 2009). The declining blood lead levels in children in the U.S. is a result of banning lead from gasoline, residential paint, the solder used in food cans and water pipes, reduced emissions from industrial point sources, and other public health efforts to increase awareness related to the issue that have been initiated since the 1970s (ATSDR, 2007).



Recently, the Centers for Disease Control and Prevention (CDC) lowered the “safe” threshold for lead exposure from 10 µg/dl to 5 µg/dl based on the belief that there is no safe level of lead in young children because of an apparent lack of a toxicity threshold in neurobehavioral studies. Note that this justification rests on risk assessment using a “no safe threshold” analytical methodology which rests on extrapolation- absence of evidence on the threshold when risk ceases- not on positive empirical evidence. The new “safe” level is based on the U.S. population of children ages 1-5 years old who are in the top 2.5% of children when tested (CDC, 2012a). This shift in policy places greater importance on primary public health prevention and is reflective of the decreasing “background” concentrations of blood lead in the general population. It should be noted that actual lead poisoning as defined by the CDC has not changed, such that clinical intervention is necessary for blood levels at or above 45 µg/dl. The CDC and other public health agencies recommend additional screening, awareness education, and home/environmental evaluations when a child’s blood lead measurement is between the “safe” level and 45 µg/dl.

And recall that comments made in my testimony concerned the lead NAAQS and perforce the relation between ambient concentrations of lead and health effects. In the CDC’s report “Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention” (CDC, 2012b), there is only one mention of air pathways being of concern or a risk factor for elevated blood lead levels. The entire report discusses ways to prevent exposure; none of which address air exposure. If the agency that is responsible for protecting public health is not concerned with air as an exposure source, why does EPA continue to put resources into studying the “problem”? To look at blood lead levels measured in children in the Denton/Collin County area of Texas, which is the only non-attainment area for lead in Texas, blood lead levels for children in that area on average are better than the rest of the State. This is true for blood lead levels prior to the 2008 revision to the NAAQS and after.

So while your question about protecting public health with an adequate margin of safety is valid and I would agree that when new data warrant, a revision should occur. The disconnect occurs between the public health reality reflected in WHO’s and the CDC’s risk assessment and EPA’s theoretical no safe threshold assessments of health risk.

References:

Agency for Toxic Substances and Disease Registry (ATSDR), 2007. Toxicological Profile for Lead. U.S. Department of Health and Human Services, Public Health Service, Atlanta, Georgia. August.

Center for Disease Control (CDC), 2009. *Fourth National Report on Human Exposure to Environmental Chemicals*. Atlanta, GA. <http://www.cdc.gov/exposurereport/>.

Center for Disease Control (CDC), 2012a. *New Blood Lead Level Information – What Do Parents Need to Know to Protect Their Children*. www.cdc.gov/nceh/lead/ACCLPP/blood_lead_levels.htm.

Center for Disease Control (CDC), 2012b. *Low Level Lead Exposure Harms Children: A Renewed Call for Primary Prevention*. Report of the Advisory Committee on Childhood Lead Poisoning Prevention of the Centers for Disease Control and Prevention. January 4, 2012.

Jones RL, Homa DM, Meyer PA, Brody DJ, Caldwell KL, Pirkle JL, Brown MJ (2009). *Trends in blood lead levels and blood lead testing among U.S. children aged 1 to 5 years, 1988-2004*. Pediatrics 2009; 123(3):e376-e385.

Please describe some of the contributing factors to the sharp decline in lead in the 1990s and early 2000s. How significant was the removal of lead from gasoline? How significant were the reductions made by the metals industry? Based on your understanding, why were the National Ambient Air Quality Standards for lead tightened in 2008? Please describe the adverse health impacts caused by lead exposure.

Many factors contributed to the dramatic decline in blood lead levels and the phase out of leaded gasoline in the 1970's was a major contributor. And I respectfully disagree with a prefatory comment in your questions. Your statement that "the wide-scale use of the catalytic converter is responsible for the removal of lead from gasoline" conflicts with my understanding of the history and facts. The catalytic converter could not be used until gasoline without tetraethyl lead was available because the lead in gasoline would corrupt the catalytic converter. Emission reductions of multiple pollutants- and importantly from carbon monoxide (CO) - were made possible from wide-spread use of the catalytic converter.

Active efforts to reduce lead began after World War II when paint manufacturers steadily reduced the use of lead. The federal government banned the use of lead in household exterior and interior paints in 1978. Lead in old drinking water pipes and in the solder in the manufacture of food cans was an important source of lead. Lead solder was largely phased out in the 1980's.

Thus, I'm not sure I would call the declines in the 1990s and 2000s as "sharp" as your question implies. The reductions in the 1990s and the early 2000s (and what may be most effective in the future) were most likely a result of continued public health initiatives to raise awareness and educate the public, and the removal of the historic lead in old paint and pipes.

Lead continues to be used in some industrial processes and consumer good and is naturally occurring.. The lion's share of lead reductions evidently occurred before the 1990s and 2000s. Total US lead emissions in air was only reduced by about 10% in the 1990's and early 2000's (ATSDR, 2009).

It is my understanding that the NAAQS for lead was reduced because of the EPA's greater reliance on the no safe threshold methodology in assessment of health risks. EPA also intended to heighten the

protectiveness for the population that has suffered adverse health effects from lead exposures. Lowering the lead NAAQS is not the most effective way to address toxicity attributable to lead that now exists to reduce exposure to the at risk populations. Specific and targeted programs to remove historical contamination are likely a more effective strategy.

Lead can cause a variety of adverse health impacts depending on chemical form, exposure, dose, and receptor-specific factors. Children under the age of 6 years (including unborn children) have higher risk to lead because their brains and nervous systems are still developing. Lead toxicity can include impaired mental functioning (Lower IQ), impaired hearing and motor control, decreased growth rate, impaired vitamin D metabolism. At higher dose and exposure levels, lead can cause kidney damage, anemia, severe brain damage, coma and death.

I would add that the EPA should document what public health benefits have been realized as a result of the significantly reduced blood lead levels since 1970's. Has this lead to higher IQ scores as predicted? If despite the huge reductions since the 1970's, the outcomes are impossible to quantify, how will the more subtle changes from post-2000 blood levels be confirmed?

References:

World Health Organization (WHO), 2006. *Preventing Disease Through Healthy Environments: towards an estimate of the environmental burden of disease*. A. Pruss-Ustun and C. Corvalan. ISBN 92 4 159382 2. WHO Library Cataloguing. 2006.

Question 2. In your characterization of the costs and benefits of EPA's MATS, you did not appear to account for the co-benefits of reducing fine particulate pollution from power plants. Please explain why, in light of the information accompanying this question.

My response to all of the questions concerning EPA's cost-benefit analysis of the MATS rule can be fully articulated through three studies.

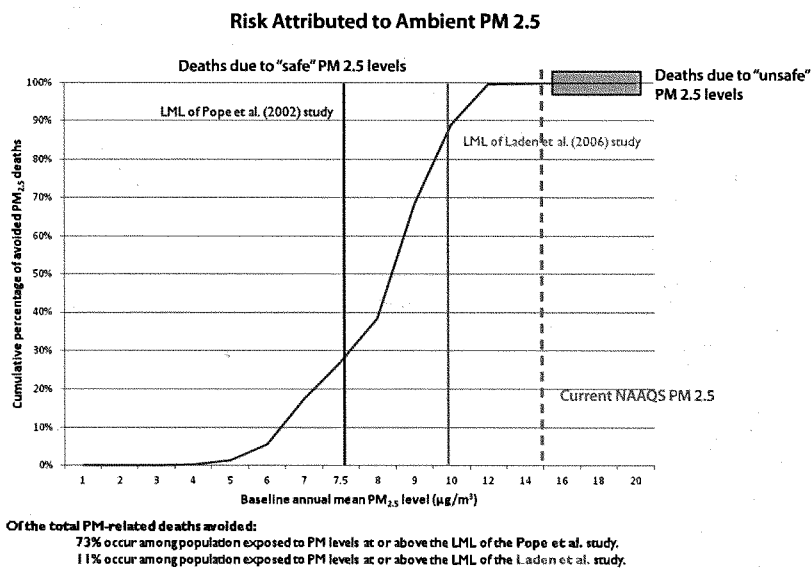
- Kathleen Hartnett White "[EPA's Pretense of Science: Regulating Phantom Risks](#)," Texas Public Policy Foundation (May 2012).
- Anne Smith, Ph.D., "[An Evaluation of the PM2.5 Health Benefits Estimates for Regulatory Impact Analysis of Recent Air Regulations](#)," NERA, (December, 2011).
- Louis Anthony (Tony) Cox, Jr., "[Reassessing the Human Health Benefits from Clean Air](#)," Risk Analysis, (November, 2011)

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Please explain how EPA or power plant operators could achieve reduction in mercury and all hazardous air pollutants emitted by power plants, in the amounts projected by EPA, without also reducing PM2.5 in the amount projected by the EPA

Of course, they could not avoid reducing PM 2.5. The emission controls that reduce mercury and HAPS coincidentally reduce PM2.5 and other pollutants. And emission controls to reduce criteria pollutants such as SO2 and Ozone also coincidentally reduce mercury and HAPS. That is why emission of mercury and HAPS have significantly declined and will continue to do so. My point is that the use of co-benefits- especially when used as more than 99% of the estimated benefits- subverts the purpose of cost-benefit

analyses. EPA calculates over 2/3 of the co-benefits from PM2.5 in the MATS rule from ambient concentrations of PM2.5 far below the current NAAQS ...to levels approaching background levels. If EPA thinks that health risks from PM2.5 persist at those trace levels far below the conservatively protective NAAQS, then EPA is legally obligated under the CAA to set the NAAQS for PM2.5 at the level.



Source: Table 5-15, EPA's RIA in final Utility MACT (mercury) Rule.

In the many rules in which co-benefits from PM2.5 comprise 50-99plus% of the alleged benefits, EPA is double-counting the health benefits from reduction of PM2.5. This double-counting falsely inflates the dollar value of the health benefits. EPA has claimed the same volume of reduction in PM2.5 in other rules. Since PM2.5 has already been removed through these rules, it cannot be removed again in the MATS rule. For a step by step detailed analysis of the double-counting, see the paper by Anne Smith noted above.

Do you believe it is consistent with Executive Order 12866, first issued by President Reagan, to quantify just the economic benefits from reducing mercury under EPA's MATS, without also quantifying the full range of benefits from reducing all air pollutants under MATS? If so please identify the language in the executive order that would justify or compel that approach.

No. EPA's method of quantifying PM2.5 co-benefits, however, is implausible (see papers above) and it allows EPA to evade making a substantive justification for direct regulation of mercury under the MATS rule. As Anne Smith notes: "The situation is completely at odds with the purpose of RIA's, which is to

provide a consistent, credible, and thoughtful analysis of the societal value gained with the increased regulatory burden that new rulemakings create.

In all, EPA's use of co-benefits should end for several reasons. It scares the public into believing large number of people would die prematurely were it not for implementation of new rules on pollutants for which EPA has not actually identified any current public health risk."

Please describe any obstacles to quantifying the benefits from reducing mercury pollution. Did EPA quantify all the possible benefits from the MATS standards, or were there categories of benefits that EPA said they could not quantify? How should we consider these benefits.

One of the reasons EPA could only attribute 0.004 % of the MATs benefits to direct reduction of mercury is because mercury in the ambient air already has been significantly reduced. Also EPA set the risk limit (also known as the reference dose) far lower than that set by the World Health Organization, the U.S. Agency for Toxic Substances and Disease Registry, and the U.S. Food and Drug Administration.

EPA bases its exceptionally low risk limit on a single study in the Faroe Islands. The small island population eats almost entirely pilot whale meat and blubber that contains mercury and other toxic chemicals. Recall that whale blubber contains far less selenium than most fish- a natural anti-toxin to bio-accumulation of mercury. This diet is irrelevant to the U.S. population as a measure of exposure risks. EPA, nonetheless, set a mercury limit or reference dose that is ten times lower than the subtle health effects found in the Faroe Island study. Yet recent blood surveys show that average blood levels are even well below the EPA's extremely conservative risk limit.

The Center for Disease Control's (CDC) National Health and Nutrition Examination Survey monitors evidence of mercury exposures. The CDC's recent study shows that blood mercury levels have steadily decreased to an average level well below the EPA's conservative limit.

**U. S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on Environment**

**Hearing Questions for the Record
Questions from The Honorable Dana Rohrabacher
Response by The Honorable Kathleen Hartnett White**

Hearing on The State of the Environment: Evaluating Progress and Priorities, 2/14/2013

Question 1. Regarding Politicized Science and Potential Measures to Restore Scientific Integrity.

The politicization of science is a critical issue of our time as also is the appropriate relation between science and public policy. The typically determinative importance given to science under environmental statutes also can undermine our democratic constitutional structure in which elected representatives in the U.S. Congress- and not federal employees- are to make the policy decisions of national consequence. EPA typically justifies its regulatory actions on what it construes as scientific edicts. Yet, scientific findings, inherently incomplete and uncertain, are incapable of weighing the complex policy considerations that inform and shape the law in a democracy.

I agree with your comment that EPA under the administrations of both parties may have manipulated science to support pre-determined policy objectives. As a former, final decision-maker for a large environmental regulatory agency, however, I conclude that EPA under the current administration has abused science far more acutely than any other administration I have observed for the last thirty years. And the stakes for our nation are now of a magnitude never encountered.

As an example of the abuse of "science," I offer my analysis in "EPA's Pretense of Science: Regulating Phantom Risk."

To restore rigor and integrity to regulatory science, I am generally supportive of proposals to separate the scientific process and the regulatory process. But I question how effective this would be. A government institution devoted to the development of the science behind EPA's risk-based regulatory limits could well be subject to the same dynamics- and thus bias- as EPA. Science which concludes existing standards are adequate to protect public health might attenuate mission and budget. Governmental bureaucracies – big or little- have an inherent drive to grow and so inflate their importance. If environmental problems recede, so would EPA's job.

Using existing federal entities such as the National Academy of Science, National Research Service or perhaps even the Congressional Research Service might provide the distance from EPA to foster more objectivity. EPA's existing advisory groups and peer-review panels could be invigorated to minimize

institutional bias. Selection of the members of these panels should be made by parties outside the EPA and should include participation by states.

In the long run, I think reform of regulatory science will require amendments to the relevant statutes. Forty years ago when the major federal environmental statutes were enacted, Congress granted broad discretionary authority to EPA as the technical expert. Over these four decades, environmental conditions have substantially improved but the EPA continually devises stricter regulation under weaker science for smaller return while failing to identify the largely localized genuine environmental problems.

See my ["The Clean Air Act: The Case for Reform"](#) and ["The Clean Air Act: Reform Proposals."](#) The need for statutory reform is an opinion increasingly shared across the political spectrum – but outside the environmental activist organizations. A four-year project enlisting the input from 40 environmental experts across the ideological spectrum concludes that the federal Clean Air Act has statutory arteriosclerosis.

To reform EPA's use of science, the Clean Air Act needs to stipulate minimal criteria for scientific risk assessment of health effects sufficiently robust to guide decisions on air quality standards. Such minimal criteria would include the following:

- EPA's risk assessments and cost-benefit analyses must be peer-reviewed by an independent body—not, as now, within EPA.
- Toxicological studies and clinical trials demonstrating causal connections between ambient levels of a pollutant and adverse health effects trump epidemiological studies indicating statistical correlations.
- Ecological epidemiological studies may be useful tools but after substantial reduction of pollutants, epidemiological studies are not rigorous enough to set national ambient air quality standards.
- Instead of relying on a few cherry-picked studies, EPA should weigh the evidence from a range of studies conducted under diverse scientific methodologies and disciplines. Toxicological science which utilizes empirical data to demonstrate causal connections should be weighted heavier than correlational studies and unvalidated models.
- Abandon the use of no threshold linear regression modeling assumptions in setting ambient standard or regulatory emission limits.
- Health-based air quality standards must incorporate representative estimates of actual exposure and not the implausible assumption of exposure to the highest monitored outdoor level. The majority of the population spends over 90 percent of a day indoors where most pollutants are far lower than outside.

- Physical measurement through monitored readings trumps models.
- Health-effects findings must include a plausible biological mechanism.
- Require comprehensive, cumulative cost-benefit analysis of all rules according to methodology and scope stipulated in law.

Science is the appropriately stipulated driver under federal environmental laws. Unquestionably, science is a critical tool for, but not the equivalent of, reasoned policy decisions about inherently uncertain environmental risks to human health. Environmental regulatory standards reflect a judgment about what is acceptable or unacceptable societal risk. EPA misleads elected law makers and the public by promoting its scientific conclusions as if they were regulatory dictates. Legislation such as the REINS Act is needed to restore the constitutional authority of Congress to make policy decisions of national consequence.

U.S. HOUSE OF REPRESENTATIVES
 COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
 Subcommittee on Environment

Response to Hearing Questions for the Record
 from The Honorable Chris Stewart
 By The Honorable Kathleen Hartnett White

Hearing on The State of the Environment: Evaluating Progress and Priorities, 2/14/2013

1. Regarding the Clean Water Act's goal to make all U.S. waters "fishable and swimmable" by 1985.

Although EPA still wrestles with how to design and implement a reliable, representative program to measure water quality across the country, major improvements in water quality have occurred. The dramatic, ongoing improvements in specific water bodies such as the Great Lakes, Chesapeake Bay, and Long Island Sound illustrate the effectiveness of locale-specific monitoring and remedial efforts.

Without consistent methods to monitor and assess, EPA cannot meaningfully identify trends in our nation's water quality over time. As EPA typically says, "While information exists for many individual water bodies, consistent national indicators for recreational water bodies [i.e. fishable and swimmable] are not yet available." But many state-driven programs have meaningful indicators for these recreational water bodies intended to be fishable and swimmable and achieve continual improvements.

Programs to assess and improve water quality are more appropriately developed on the state, local, and watershed levels. Many states and localities have robust programs to assess water quality over time and to actively improve conditions. The complexity, diversity, and inherent variability of the thousands of rivers and streams in the U.S. may preclude a consistent nationwide program to assess water quality. The scale of the diverse types and uses of specific water bodies makes the "fishable and swimmable" goal for all water bodies unrealistic. An ephemeral stream in the arid western portions of Texas may only have scant pools of water a few days of the year. Fishing and swimming cannot occur in such water bodies.

EPA's programs should more actively facilitate creative state and watershed based programs rather than dictate the parameters and procedure of those programs.

2. Regarding recommendations for restoring objective, rigorous, and transparent science at the EPA including establishing minimal criteria for scientific risk assessment of health effects.

For further discussion of the points addressed below, please see my "[EPA's Pretense of Science: Regulating Phantom Risks](#)," "[The Clean Air Act: The Case for Reform](#)," and "[The Clean Air Act: Reform Proposals](#)."

After major reduction in the ambient levels of the criteria pollutants and many toxins over the last twenty to forty years, EPA is now using increasingly weak-to-implausible science in order to justify aggressive regulatory reduction of these pollutants. Current EPA science reveals a pattern. The agency relies on one or two cherry-picked studies which indicate the most adverse health effects at the lowest concentration of the pollutant in question. EPA either ignores or gives lip service to sometimes hundreds of equally reputable studies that contradict EPA's selected studies.

EPA's favored studies are invariably ecological epidemiological studies that may show intricately manipulated *statistical associations* rather than data-driven toxicologically *causal connections* between pollutant levels and adverse health effects. And instead of characterizing the relative uncertainties in the scientific studies on which EPA relies and weighing the evidence from diverse studies, EPA publically declares complete certainty and approval by peer review. EPA's so-called uncertainty analysis is a model which assumes 100% probability! Upon a closer look, the peer-reviewers regularly are either EPA employees, scientists who wrote the relevant studies, or were employed by the same institution which EPA paid to conduct the study.

Many reputable scientific bodies have severely criticized the weakness of science that the EPA now relies upon to justify new rules. Dr. Thomas Burke, chairman of a recent National Academy of Science (NAS) review panel on EPA's chemical risk assessment told EPA officials that "EPA science is on the rocks ... if you fail, you become irrelevant, and that is kind of a crisis."¹ EPA's chemical risk assessment for formaldehyde set the level for adverse health effects- and thus regulation- several times lower than the average natural level of formaldehyde in human exhalation.¹ EPA characterizes these risk assessments—also known as Integrated Science Assessment (ISA)—as the scientific foundation of its regulatory decision.

The Clean Air Act needs to stipulate minimal criteria for scientific risk assessment of health effects sufficiently robust to guide decisions on air quality standards. Such minimal criteria would include the following:

- EPA's risk assessments must be peer-reviewed by an independent body—not, as now, within EPA.
- Toxicological studies and clinical trials demonstrating causal connections between ambient levels of a pollutant and adverse health effects trump epidemiological studies indicating statistical correlations.
- Ecological epidemiological studies may be useful tools but after substantial reduction of pollutants, epidemiological studies are not rigorous enough to set national ambient or emission standards. Instead of relying on a few cherry-picked studies, EPA should weigh the evidence from a range of studies conducted under diverse scientific methodologies and disciplines. Methodologies which utilize empirical data which demonstrate causal connections should be weighted heavier than correlational studies and unvalidated models.

- Abandon the use of no threshold linear regression modeling assumptions in setting ambient standard or regulatory emission limits.
- Health-based air quality standards must incorporate representative estimates of actual exposure and not the implausible assumption of exposure to the highest monitored outdoor level. The majority of the population spends over 90 percent of a day indoors where most pollutants are far lower than outside.
- Physical measurement through monitored readings trumps models.
- Health-effects findings must include a plausible biological mechanism.
- Require comprehensive, cumulative cost-benefit analysis of all rules according to methodology and scope stipulated in law.

Science is the appropriately stipulated driver under federal environmental laws. Unquestionably, science is a critical tool for, but not the equivalent of, reasoned policy decisions about inherently uncertain environmental risks to human health. Environmental regulatory standards reflect a judgment about what is acceptable or unacceptable societal risk. EPA misleads elected law makers and the public by promoting its scientific conclusions as if they were regulatory dictates. Legislation such as the REINS Act is needed to restore the constitutional authority of Congress to make policy decisions of national consequence.

ⁱ “Key Advisor Warns EPA to Improve Agency Science or Face a ‘Crisis,’” InsideEPA.com (8 July 2011).

ⁱⁱ Michael Honeycutt, Ph.D., Texas Commission on Environmental Quality, “Comments Regarding the Use of Science in, and Implications of, EPA’s Chemical Risk Assessments.” (4 Oct 2011).

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY
Subcommittee on the Environment**

**Response to Hearing Questions for the Record
Questions from The Honorable Randy Neugebauer
Response from The Honorable Kathleen Hartnett White**

Hearing on The State of the Environment: Evaluating Progress and Priorities, 2/4/2013

Question 1. Regarding Drought Impacts in Texas.

I have been privileged to make many decisions affecting water supply as former member of the Texas Water Development Board, a former Chairman of the Texas Commission on Environmental Quality (TCEQ) and now as an Officer and Director of the Lower Colorado River Authority (LCRA).

The extraordinarily intense droughts during three of the last four years have awakened Texas to the urgency of increasing the state's available water supply. The record breaking drought of the single year of 2011 created water shortages, in some local areas, perhaps more severe than Texas' historical drought of record in the 1950's. For decades, Texas has determined water availability and has managed water supply on the basis of the average hydrological conditions during the decade of the 1950's—the historical drought of record. Yet, 2011 created conditions in some areas never experienced within a twelve month period.

As a single example of unprecedented drought impacts, farmers in the lower Colorado River basin were denied irrigation water for the first time in 75 years in 2012. Because the storage levels in the reservoirs in question fell so low in 2011, irrigators have again been denied water in 2013 for the second year in a row. Current or near term water shortages now face many areas in Texas.

Texas has developed state of the art regional water plans, compiled into a State Water Plan, that project increased water demands in 16 different regions of the state through 2060 when the state's population is expected to have doubled. Until recently, water shortages were not projected until the outlying years. The plans identify thousands of specific water supply projects to increase supply to meet future demand. With few exceptions, the projects have not been completed or even begun in most cases.

The drought of the last few years, however, has made water shortage a current condition and no longer a future projection. River authorities like LCRA, water supply districts, and cities announce bold projects to increase supply but timely implementation still remains elusive.

Inadequate financing and regulatory impediments are the chief obstacles to increasing water availability in Texas. The Texas Legislature is poised to use \$2 billion of the state's Rainy Day Fund to provide low interest loans for water supply projects. The authorizing legislation for this State Water Infrastructure

Fund for Texas (SWIFT) would invest significant portions of this fund to eventually generate the \$27 billion needed.

In my judgment, regulatory impediments flowing from state and federal law are an equal, and perhaps more formidable, barrier to Texas' increasingly urgent need to increase water supply. After the landmark legislation in 1997 that created the framework for the states' regional water planning process intended to expedite water projects, Texas passed water law that did not facilitate, but indeed complicated, water projects. One new law required development of regulatory environmental flow standards in every river basin of the state. Other recently enacted law gave local groundwater districts the authority to limit pumping and transfer of groundwater and for the first time gave the state the authority to determine the future conditions of aquifer.

Other issues surrounding the inter-basin transfer of water and amendments to existing water rights have stymied private water markets, previously envisioned to be the most efficient means of meeting water demand in this rapidly growing state. Legislative efforts and legal challenges have made little headway.

The federal impediments, especially through the Endangered Species Act (ESA) and the Corps of Engineer's/EPA's authority, increasingly challenge Texas. Last week, a federal judge ruled that TCEQ's allocation of the water in the Guadalupe River violated the Endangered Species Act, and the court enjoined the state from any future allocations until USFWS approves a plan to protect the endangered whooping cranes in Aransas Bay. The Fifth Circuit Court of Appeals granted the state's request to stay the district court's order pending complete appellate review. This is the first, and may be the most damaging, federal interference in the state's authority over water since the federal court rulings under the ESA to limit withdrawals from the Edwards Aquifer on which San Antonio is wholly dependent to provide municipal water.

Texas is blessed with prodigious water resources but the state has entered a new era when aging and outdated water infrastructure must be expanded and replaced. This is a story across many states. With less regulatory impediment, most effectively achieved through strategic reform of the federal laws at issue, private financing and private actors could proceed with dispatch.

Question 2. Regarding the Status of Cooperative Federalism under the Clean Air Act

The EPA may occasionally acknowledge the original Clean Air Act's federalist structure but in practice either undermines or flatly denies the states' authority under the statute. (See my "[EPA Process and Texas Results: Understanding the Dispute Between the Two Largest Environmental Agencies](#)" and "[The Clean Air Act: The Case for Reform](#).")

If the EPA actually deferred to the cooperative federalism articulated in the original Clean Air Act, states could more efficiently, effectively, and rapidly improve air and water quality. As stated in 1977, "Congress carefully balanced State and national interests by providing for a fair and open process in

which States and local governments, and the people they represent, will be free to carry out the reasoned weighing of environmental and economic goals and needs.” Or in the words of the 1970 CAA, the “prevention and control of air pollution is the primary responsibility of the States and local government” because those closest to the resource are best able to effectively manage them. In a nutshell, the CAA provides that EPA will set the national standards but the states will choose how to attain those standards.

How far EPA has strayed from this statutory framework, a path made easier by the 1990 amendments to the Act which substantially expanded EPA’s oversight authority. EPA increasingly treats state agencies as instruments of the federal government rather than as partners, much less equal sovereigns. EPA acts, perhaps, most intrusively under the federal authority to approve State Implementation Plans (SIP) for the criteria pollutants. EPA uses SIP authority to threaten disapproval of all state regulation vaguely related to air quality including procedural rules. A study by the National Research Council in 2005 agreed that EPA’s procedural micromanagement of state agencies impedes efficient environmental improvements.

Of note is EPA’s disapproval of the Texas Flexible Permit Program. This program, in place for over 16 years before EPA decided to disapprove, was a major success in reducing emissions of criteria pollutants and toxics. EPA legally nixed the program (very similar to the EPA’s permitting program utilizing Plant-wide Applicable Limits –PALS) on the basis of hair-splitting differences in terminology. A recent D.C. Circuit Court of Appeals decisions upheld the Texas program and sharply rebuked EPA for denial of the state authority under the CAA. But damage to the Texas environment and economy was already done.

Question 3. Regarding Current EPA Science and the “No Safe Threshold” (NST) Statistical Methodology in Risk Assessment.

See my [“EPA’s Pretense of Science: Regulating Phantom Risks.”](#) My paper draws upon two excellent studies noted below that are related to EPA’s use of NST methodology.

Anne Smith, Ph.D., “An Evaluation of the PM2.5 Health Benefits Estimates for Regulatory Impact Analysis of Recent Air Regulations,” NERA, (December, 2011).

Louis Anthony (Tony) Cox, Jr., “Reassessing the Human Health Benefits from Clean Air,” Risk Analysis, (November, 2011).

In my view as a former regulator, EPA’s current science lacks credibility, is not an adequate justification for the many new air quality rules, and misleads policymakers and the general public. As one example of the problem with EPA’s regulatory science, I confine my response to EPA’s increasing reliance on the No Safe Threshold (NST) statistical methodology.

In 2009, EPA made a methodological change with huge ramifications. EPA now calculates mortality risks from PM_{2.5} not only below the health protective level of the NAAQS, recently changed from 15 to 12 ug/m³ (annual), but also below the lowest measured level (LML) in the original studies and even below natural background levels approaching zero. Remarkably, EPA now assumes that there is no level of PM_{2.5} below which risks to premature death cease. Statisticians call this a “no threshold linear regression to zero analytic model.” In laymen’s terms, no risk is too low.

Prior to 2009, the EPA did not estimate risks below the lowest ambient level measured in the epidemiological studies. If the PM level in a given location was already below the LML (typically ~10 ug/m³), the EPA did not assume additional reductions in PM_{2.5} would generate additional health benefits. “However, starting in 2009, EPA decided that it would calculate risks to the lowest level projected by its air quality models, even though no observed or empirical evidence exists ... in that low concentration zone.”ⁱ

The statistical associations between premature mortality and PM_{2.5} identified in the epidemiological studies cease below the lowest measured level in the study. But EPA now imputes, by extrapolation, the same risks (and at the same rate) for PM_{2.5} levels for which no statistical evidence exists. “Extrapolation is the use of quantitative relationships outside the range of evidence on which it was based.”ⁱⁱ

EPA’s adoption of this no-threshold approach to assessing risk increased EPA’s estimate of total U.S. deaths attributable to PM_{2.5} pollution by almost four-fold—from a previous estimate of 88,000 to 320,000! This approach means that over two-thirds of the public’s health risk from exposure to PM_{2.5} come from ambient levels not only far below the protective national standards known as the NAAQS but even below the lowest modeled levels in the relevant studies.ⁱⁱⁱ

In short, EPA incredulously finds that mortal risks increase in proportion to the extent that a location’s ambient concentration of PM_{2.5} exceeds natural background levels, which EPA now estimates to be an extremely low level of 1 ug/m³. “This created a major change in the level of national mortality estimated to be due to PM_{2.5} because the majority of the U.S. population resides in locations where the ambient PM_{2.5} concentrations are below 10ug/m³.”^{iv}

After probing questions from members of Congress, senior EPA leadership recently defended adoption of the no-threshold approach. “Studies demonstrate an association between premature mortality and fine particle pollution at the lowest levels measured in the relevant studies, levels that are significantly below the NAAQS for fine particles. *These studies have not observed a level below which premature mortality effects do not occur.* The best scientific evidence, ... is that there is no threshold level of fine particle pollution below which health risk reductions are not achieved by reduced exposure.” This is another way of saying: No risk is too low, improbable, or uncertain that it is not worth regulating.^v

EPA claims that the two studies in question show no evidence of a threshold, but many studies ignored by EPA do show a threshold. EPA’s Benefit Study admits that the “no-threshold” assumption is a “key

uncertainty” but as usual assigns a “high” confidence to the model that incorporates this assumption. The single study that EPA cites to support this questionable “no-threshold” assumption is an EPA’s Health-Effects Institute funded study.

And importantly, the “no-threshold” assumption violates the foundational principle of toxicology. It is the dose that makes the poison. EPA’s defense of this absurdly precautionary assumption is another way of saying that the point at which all risk is zero cannot be proven. This is not surprising. How can any negative proposition be proven with complete certainty?

EPA also maintains that its adoption of a “no-threshold” assumption in 2009 was endorsed by EPA’s various scientific advisory panels. The growing evidence of financial conflicts of interest among the members of EPA’s technical review panels casts doubts on the objectivity of these review panels. Six of the seven members of the EPA’s Clean Air Science Advisory Committee (CASAC) have received EPA grants to conduct research for the Agency.^{vi} CASAC Chairman Jonathan Samet was the principal researcher for grants of \$9.5 million dollars.

And in addition to questionable peer review, the EPA did not give any public notice of the regulatory implications of this sea-change in risk assessment of current air quality conditions—now at extremely low concentrations of PM2.5 in most parts of this country. Public health scientists may have long debated the relative merits of no-threshold linear regression analyses, but these were scientific debates without the economic and societal implications at stake in EPA’s regulatory agenda, unprecedented in its cumulative impacts.

ⁱ Ann E. Smith, Ph.D “An Evaluation of the PM2.5 Health Benefits Estimates in Regulatory Impact Analyses for Recent Air Regulations,” p. 23 NERA Economic Consulting (Dec. 2011).

ⁱⁱ *Ibid.*

ⁱⁱⁱ *Ibid.*, p. 24.

^{iv} *Ibid.*

^v Gina McCarthy, Assistant Administrator, Environmental Protection Agency, to Rep. Fred Upton, February 3, 2012.

^{vi} Steve Milloy, “Clearing the Air on the EPA,” *Washington Times* (7 Mar. 2012).

Responses by Mr. Richard Trzupek

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AND THE WORKFORCE
SUBCOMMITTEES:
HIGHER EDUCATION AND WORKFORCE TRAINING
WORKFORCE EDUCATION

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEES:
ENVIRONMENT, RANKING MEMBER
SPACE

March 20, 2013

The Honorable Chris Stewart, Chairman
Environment Subcommittee
House Science, Space, and Technology Committee
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Stewart:

Thank you for your letter regarding my concerns over inaccuracies in the testimony of Mr. Richard Trzupek and Ms. Kathleen Hartnett-White at the Environment Subcommittee's February 14th hearing on *The State of the Environment: Evaluating Progress and Priorities*. Both of these witness testimonies assert, essentially, that because the United States has been so successful at reducing air pollution, the U.S. EPA has resorted to cleaning up insignificant pollution in an attempt to stay relevant.

Though it is unquestionably true that we have made great progress since the Clean Air Act was signed into law in 1970, we are far from done. As we have achieved many important milestones in reducing dangerous air pollution, so too have we continued to learn about the dangers of breathing polluted air. More than 100 million Americans still live in areas experiencing unhealthy levels of air pollution. According to data from as recently as 2010, EPA research shows that approximately 124 million people live in counties that exceeded one or more national ambient air quality standard. This pollution puts our most sensitive populations, our children, and the elderly, at risk. And the risks can be deadly. Rather than patting ourselves on the back for a job well done, we must recognize the significant challenges that still remain.

Thank you for including my March 7th letter and memorandum in the hearing record, and also for your willingness to keep the record open so that I may address questions to the witnesses directly. Attached you will find my questions for Mr. Trzupek and Ms. Hartnett-White. I look forward to their responses, and to working with you through the 113th Congress to ensure that our witnesses provide the Committee fair and balanced testimony regarding the most important environmental issues we face.

Sincerely,



Representative Suzanne Bonamici
Ranking Member
Environment Subcommittee
House Committee on Science, Space, and Technology Committee

Questions for Mr. Richard Trzupek:

1) On Page 4 of your testimony you use EPA's toxic air pollution standards for industrial boilers and incinerators as an example to claim that the U.S. EPA inaccurately represents the costs and benefits of its regulations. You highlight only the 18,000 tons per year of $PM_{2.5}$ emissions directly reduced by recent industrial boiler air toxics standards, and then go on to claim that this is an insignificant reduction because it is a small percentage (.3%) of overall national emissions of fine particulate matter. Your testimony fails to mention that the standards also will reduce harmful sulfur dioxide (SO_2) emissions by 580,000 tons per year – which is equivalent to roughly 17% of the SO_2 emissions from the electric power sector, far and away the biggest source of SO_2 in the country (with SO_2 emissions of 3,285,164 tons per year in 2012). Moreover, EPA notes that these 580,000 tons of SO_2 emissions avoided each year are a *pre-cursor* to $PM_{2.5}$ emissions that will be reduced *separate and apart* from the 18,000 tons per year of *direct* $PM_{2.5}$ emissions that the standards will reduce.

- How would you characterize the level of *indirect* $PM_{2.5}$ emissions reductions that these standards are achieving, including by accounting for the standards' projected reduction of 580,000 tons per year of SO_2 ?
- What was the statutory deadline established by Congress in the 1990 Clean Air Act Amendments for promulgation of these standards?
- What has been the approximate impact of this delay, in terms of Americans' exposure to millions of additional tons of air pollution, compared to what Congress intended when it required standards for the largest sources of industrial hazardous air pollution no later than 2000? Please estimate the impact using the same health endpoints used by EPA in its industrial boiler and incinerator standards.

2) On page 6, your testimony characterizes the cost-benefit analysis numbers offered by EPA in its Regulatory Impact Analysis accompanying the toxic air pollution standards for industrial boilers as "peculiar logic." Your testimony further appears to link public health improvements to the national debt, going on to claim that EPA's benefits numbers are inflated accordingly. EPA's \$26.4 billion benefits figure represents avoided health hazards that Americans will no longer suffer every year (from premature deaths, heart attacks, strokes and asthma attacks, for example). This figure also includes lower costs attributable to purely economic considerations (like missed work and school days). This substantial benefit outweighs compliance costs by a factor of at least 13.

- Is it appropriate to correlate public health benefits to the national debt? Can you point to government, economic or academic literature where this correlation is used as an appropriate indicator of the value of public or private programs?

3) Regarding points made on pages 4–6 of your testimony, the industrial boiler Maximum Achievable Control Technology (MACT) standards are technology-based standards under § 112 of the Clean Air Act that essentially require air pollution reductions to the degree achievable by modern technology. Congress, "concerned about the slow pace of EPA's regulation of HAPs, altered section 112," and abandoned the earlier law's risk-based approach after it proved to be unworkable. *New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008). The 1990 amendments

extensively revised §112 of the Clean Air Act to include criteria for “specific, strict pollution control requirements on both new and existing sources” of hazardous air pollutants. *Id.* Your testimony appears to evaluate the benefits of a technology-based rule that requires huge reductions from individual pollution sources as a percentage of “reductions in overall national” emissions. However, people do not breathe pollution “on average” or “nationally.” They breathe air pollution where they live and work and attend school.

- Was the Clean Air Act – with its focus on individual major and area sources – not meant to achieve reductions in dangerous air pollution from polluting facilities in individual American communities?
- Do you dispute that industrial boilers and coal-fired power plants are two of the largest emitters of hazardous air pollution in the nation? Do you believe they should they be exempted from regulation or given more lax treatment under section 112 of the Clean Air Act, when over 150 other industrial sectors have sharply cut their hazardous air pollution under the 1990 amendments?

4) On page 8 of your testimony you assert that “[w]e simply do not have an air toxics problem in the United States today.” However, the most recent National Air Toxics Assessment (whose pie charts you use in Appendix B of your testimony), found that “*all 285 million people in the U.S. have an increased cancer risk of greater than 10 in one million*” attributable to breathing toxic air pollution from outside sources. The Assessment went on to note that:

13.8 million people (less than 5 percent of the total U.S. population based on the 2000 census) have an increased cancer risk of greater than 100 in a million. The average, national, cancer risk for 2005 is 50 in a million. This means that, on average, approximately 1 in every 20,000 people have an increased likelihood of contracting cancer as a result of breathing air toxics from outdoor sources if they were exposed to 2005 emission levels over the course of their lifetime.¹

The Clean Air Act Amendments of 1990, passed by overwhelming bipartisan majorities, established the Congressional goal to reduce cancer risks for all Americans below 1 in 1 million. The cancer risks associated with air toxics are real, and yet the three largest industrial sources of many of these toxic pollutants (electric generating facilities, cement plants, and industrial boilers) remained uncontrolled at the federal level until as late as 2012.

- In your opinion, and based on the most recent National Air Toxics Assessment and other information that we invite you to identify, how close are we to reaching the goal of reducing cancer risks to less than 1 in 1 million established by Congress in the Clean Air Act Amendments of 1990?

¹ U.S. EPA, *Summary of Results for the 2005 National-Scale Assessment*, available at http://www.epa.gov/ttn/atw/nata2005/05ndt/sum_results.pdf

Questions for the Hon. Kathleen Hartnett White:

1) You claim victory over lead pollution in citing the elimination of lead from fuels in the 1970s, and you assert on page 7 that "EPA could declare victory on lead and maintain the current NAAQS but instead chose to lower the standard below naturally occurring background levels in most areas." It is important to note that the wide-scale use of the catalytic converter is responsible for the removal of lead from gasoline. This technology was adopted in 1975 model-year cars due to the U.S. EPA's adoption of strict standards for lead. This example speaks to the overwhelming importance of environmental standards as drivers of improvements in the industrial sector. Moreover, it is a misrepresentation of both the law and the science to state that "EPA could declare victory on lead." The National Ambient Air Quality Standards of the Clean Air Act require regular review of the state of the science on dangerous air pollution and require the agency to update standards based on the best and most current science available.

- Do you agree that it would be inappropriate and unlawful for EPA to ignore advances in scientific understanding that would justify revising the lead standard or other air quality standard to protect public health with an adequate margin of safety?
- Please describe some of the contributing factors to the sharp decline in lead in the 1990s and early 2000s. How significant was the removal of lead from gasoline? How significant were the reductions made by the metals industry?
Based on your understanding, why were the National Ambient Air Quality Standards for lead tightened in 2008? Please describe the adverse health impacts caused by lead exposure.

2) In your testimony you criticize EPA's Mercury and Air Toxics Standards for power plants, and claim that "EPA admits that the cost of this regulation—at the EPA estimate of \$10 billion per year—is perhaps the most expensive air regulation to date. EPA also admits that the benefits from mercury reduction are so minute to be immeasurable." This distorts the cost-benefit analysis accompanying the standards and the full range of benefits identified by EPA. Power plants emit toxic air pollution that can also be classified as PM_{2.5} pollution due to its size and chemical makeup. In addition, the same small number of pollution control devices that remove toxic air pollution from power plant emissions also *necessarily* remove PM_{2.5} pollution. In light of this, EPA includes PM_{2.5} co-benefits in its benefit calculations for the Mercury and Air Toxics Standards, a practice EPA also followed under the two previous administrations for other air toxics standards. Reducing PM_{2.5} pollution from power plants can prevent thousands of premature deaths, heart attacks, and asthma attacks each year.

- In your characterization of the costs and benefits of EPA's MATS, you did not appear to account for the co-benefits of reducing fine particulate pollution from power plants. Please explain why, in light of the information accompanying this question.
- Please explain how EPA or power plant operators could achieve reductions in mercury and all hazardous air pollutants emitted by power plants, in the amounts required by EPA's MATS, without *also* reducing PM_{2.5} in the amounts projected by EPA?
- Do you believe it is consistent with Executive Order 12866, first issued by President Reagan, to quantify just the economic benefits from reducing mercury under EPA's

MATS, without also quantifying the full range of benefits from reducing all six pollutants under MATS? If so, please identify the language in the executive order that would justify or compel that approach.

- Please describe any obstacles to quantifying the benefits from reducing mercury pollution. Did EPA quantify all the possible benefits from the MATS standards, or were there categories of benefits that EPA said they could not quantify? How should we consider these benefits?

RICHARD J. TRZUPEK

May 1, 2013

The Honorable Chris Stewart, Chairman
Environment Subcommittee
House Science, Space and Technology Committee
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Stewart

I am pleased to respond to Ranking Member Bonamici's questions regarding my testimony of February 14 and I apologize for my tardiness in sending you this response.

Question 1

Representative Bonamici notes that USEPA says that the Boiler MACT regulations will result in a reduction of 580,000 tons per year of sulfur dioxide (SO₂) emissions nationwide and that SO₂ contributes to formation of fine particulate matter (PM-2.5). The questions then posed are as follows:

How would you characterize the level of indirect PM-2.5 emissions reduction that these standards are achieving, including by accounting for the standards' projected reduction of 580,000 tons per year of SO₂?

First of all, it should be noted that the standards in question are part of a National Emissions Standard for Hazardous Air Pollutants, or NESHAP (emphasis added). Neither SO₂ nor PM-2.5 are classified as Hazardous Air Pollutants (HAPs). Both are rather classified as criteria pollutants. There are other regulations and programs in place and in development that address SO₂ and PM-2.5 emissions and concentrations in ambient air. The Acid Rain program, the Cross State Air Pollutant Rule, numerous state-level regulations that are incorporated in State Implementation Plans (SIPs) and USEPA's continuing development of PM-2.5 rules and attainment designations are examples of these. The purpose of a NESHAP, as I understand the Clean Air Act, is to ensure that HAP emissions are properly controlled, not to add another regulatory layer for the control of criteria pollutant emissions. It is curious to find the EPA, in the eternal search for "big numbers" to tout, highlighting emissions reductions of criteria pollutants as part of the promulgation of a rule that doesn't actually target – or isn't supposed to target – criteria pollutants.

If the United States needs to reduce SO₂ emissions by an additional 580,000 tons per year (on top of the millions of tons of reductions that have already been achieved) why wouldn't USEPA use the regulatory mechanisms already in place and in development to do so? I believe that there are two possible answers to this question. Either the regulatory mechanisms already in place and in development are inadequate to achieve this reduction, or the reduction itself cannot be justified on the grounds of achieving compliance with National Ambient Air Quality Standards (NAAQS) for SO₂ and PM-2.5.

USEPA's Green Book currently lists a total of nine non-attainment areas for SO₂: East Helena, Montana; Salt Lake County, Utah; Tooele County, Utah; Warren County, New Jersey; Armstrong County, Pennsylvania; Pinal County, Arizona; Yellowstone County, Montana; Piti, Guam; and Tanquisson, Guam. (Map appended). With possible exceptions of Warren County and Armstrong County, I don't believe that anyone could claim that 580,000 tons per year of SO₂ emission reductions from industrial boilers are going to result in any measurable reduction of SO₂ concentrations in the ambient air in any of these locations. If USEPA proposed reducing SO₂ emissions by 580,000 tons per year in order to bring nine isolated non-attainment areas (which are already moving toward attainment, by the way) into attainment the Agency wouldn't be able to do so on any reasonable technical, environmental or economic basis.

Having recently introduced a new short-term SO₂ standard, USEPA and the states are in the process of evaluating attainment status with respect to the new (effectively even more stringent) standard. After attainment designations are complete, State Implementation Plans (SIPs) will be duly modified and another set of regulations put in place in order to address any non-attainment areas.

The USEPA has designated thirty-two PM-2.5 non-attainment areas under the current (2006) standard and thirty-five PM-2.5 non-attainment areas under the previous (1997) standard. (Maps appended). As is the case with all other criteria pollutants, the process of modifying SIPs and implementing new regulations to address these non-attainment areas continues to grind along. As USEPA implements yet another (and yet again more stringent) PM-2.5 standard, the Agency itself says that "Most of the U.S already meets the (new) annual fine particulate health standard" (map appended).

The point of all this being that it's disingenuous to justify a boiler NESHAP on the basis of criteria pollutant reductions, especially when: a) the EPA already regulates criteria pollutants under other, existing programs, and b) areas in which concentrations of those criteria pollutants exceed ambient air quality standards are limited in number and those are already on the road to attainment.

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I don't agree with the underlying premise of the question: that Congress intended to use Title III of the Clean Air Act to reduce millions of tons of air pollutants regulated under Title I and Title IV. According to USEPA Boiler MACT will result in the reduction of 2 to 3 tons per year of Mercury, 2,100 hundred tons per year of non-mercury metals and 40,500 tons of hydrogen chloride. I doubt that any of these reductions represent a significant reduction when compared to all sources (including natural sources) of these pollutants. This is particularly so in the case of mercury, which USEPA has identified as a "global pollutant" that all nations play a role in contributing to concentrations in the air we all share, with China and India accounting for the vast majority of mercury emissions worldwide. The two to three ton reduction associated with Boiler MACT is basically baseline noise in this context.

The Committee should also note that the EPA identifies priority toxic pollutants that it monitors through its network of National Air Toxics Trends Stations. Industrial boilers are not a significant source of the two priority toxics that USEPA says are of greatest concern, accounting for approximately 60% of individual cancer risk in the US: benzene and formaldehyde. Nor are industrial boilers a significant source of the other priority organic toxics (carbon tetrachloride, chloromethane, dichloromethane, 1,3 butadiene, 2,2,4 trimethylpentane, ethylbenzene, n-hexane, o-xylene, styrene, toluene, acetaldehyde and propionaldehyde). Industrial boilers do contribute, albeit much less than utility boilers, to concentrations of the four priority toxic metals (arsenic, lead, manganese and nickel) although concentrations of these metals in the ambient air have been steadily declining as well.

I believe that USEPA's own prioritization of air toxics underscores the relative unimportance of HAP emissions from industrial boilers and that this more honestly speaks to the lack of any significant health risk associated with these emissions than EPA-commissioned studies that are necessarily self-serving and have the unique advantage of being unverifiable in the real world.

Question 2

This question concerns this portion of my written testimony:

"Let's return to those monetary benefit claims. Using the low end of the numbers presented by USEPA, a \$2.2 billion investment will result in a \$28.6 billion return. What a terrific result. But why stop there? If controlling a mere 18,000 tons per year of fine particulate matter can result in the generation of \$26.4 billion in net income, what would happen if we controlled all 6.1 million tons per year of fine particulate matter? Using USEPA's minimum cost effectiveness approach, we find that applying the same rate of return would generate \$8.9 trillion per year in net revenue. We have thus solved America's debt crisis. All we need to do is build a dome over the nation to keep every bit of fine particulate out and we'll clear the national debt in two years.

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If we are to evaluate the need for Boiler MACT, we should do so solely on the basis of the reductions in HAP emissions it is supposed to address. Here it is more difficult to justify the rule, because the reductions of HAPs are relatively insignificant in terms of being protective of human health and the environment and there is little evidence that any of the HAPs emitted in significant quantities by industrial boilers are present in the ambient air in concentrations that presents a significant risk to human health or the environment.

What was the statutory deadline established by Congress in the 1990 Clean Air Act Amendments for promulgation of these standards?

From Section 112(e) of the Clean Air Act Amendments of 1990:

(1) IN GENERAL- The Administrator shall promulgate regulations establishing emission standards for categories and subcategories of sources initially listed for regulation pursuant to subsection (c)(1) as expeditiously as practicable, assuring that--

(A) emission standards for not less than 40 categories and subcategories (not counting coke oven batteries) shall be promulgated not later than 2 years after the date of enactment of the Clean Air Act Amendments of 1990;

(B) emission standards for coke oven batteries shall be promulgated not later than December 31, 1992;

(C) emission standards for 25 per centum of the listed categories and subcategories shall be promulgated not later than 4 years after the date of enactment of the Clean Air Act Amendments of 1990;

(D) emission standards for an additional 25 per centum of the listed categories and subcategories shall be promulgated not later than 7 years after the date of enactment of the Clean Air Act Amendments of 1990; and

(E) emission standards for all categories and subcategories shall be promulgated not later than 10 years after the date of enactment of the Clean Air Act Amendments of 1990.

What has been the approximate impact of this delay, in terms of Americans' exposure to millions of additional tons of air pollution, compared to what Congress intended when it required standards for the largest sources of industrial hazardous air pollution no later than 2000? Please estimate the impact using the same health endpoints used by EPA in its industrial boiler and incinerator standards.

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USEPA also claims that Boiler MACT implementation will result in the avoidance of 8,100 premature deaths per year. If we extend that peculiar logic, we find that control of all 6.1 million tons of fine particulate will avoid over 27 million premature deaths per year. The road to immortality apparently awaits.

Obviously, these absurd conclusions cannot hold up to any scientific scrutiny. They are presented as one way to illustrate the way in which EPA's regulatory analyses and justifications don't make sense in any real world context. Absurd assumptions must necessarily result in absurd conclusions."

The question posed with regard to this portion of my written testimony is:

Is it appropriate to correlate public health benefits to the national debt? Can you point to government, economic or academic literature where this correlation is used as an appropriate indicator of the value of public or private programs?

I would have thought my use of the word "absurd" would make it clear that I was employing a bit of flip hyperbole to make a point, but it is perhaps dangerous to resort to humor within the beltway. In any case, linking theoretical, unverifiable public health improvements to economic benefits is a USEPA concept, not mine.

And perhaps I am alone in wondering how all of the public health benefits that have supposedly resulted from increasingly stringent environmental regulation have manifested themselves in the real world? According to the Bureau of Labor statistics, the number of hours worked per week by the average American worker has been trending steadily down for the last forty years, but we're assured that environmental regulation results in people taking off less sick days. (As though the average American worker is going to let a sick day to which he or she is entitled go unused!) We continue to debate the ever-increasing cost of healthcare, but we're told that USEPA regulations are saving us billions upon billions in health benefits.

Question 3

There are several questions regarding toxic air pollutants here, which I will answer in turn.

Was the Clean Air Act -- with its focus on individual major and area sources -- not meant to achieve reductions in dangerous air pollution from polluting facilities in individual American communities?

First and foremost, I believe the Clean Air Act was meant to provide for the establishment of ambient air standards that are protective of human health and the environment and then to

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provide for the creation of appropriate regulatory mechanisms to achieve to meet those standards. If a particular community is exposed to concentrations of a particular pollutant that is deemed to create an unacceptable level of risk, then the ways to best mitigate that exposure should be (and are) examined. Such measures often include emission reductions among certain kinds of sources. This measure, technically sound approach to air pollution regulation is scientifically defensible. Demanding “across the board”, continuing reductions *ad infinitum* based solely on the type of source and its location is neither sound science nor good policy.

It is also technically incorrect to imply, as this question does, that sources like industrial boilers have a significant effect on the air quality in the communities in which they exist. As USEPA recognizes, “tall stack” emissions units have a relatively minor impact on surrounding host communities, because of atmospheric dispersion. In a practical sense, the average American is exposed to a far greater *concentration* of toxic air pollutants when walking past their local dry cleaner (with its relatively low stack) or when cooking on the backyard barbecue (which generates a smorgasbord of organic HAPs).

Neither of the above statements should be construed as advice to cease using dry-cleaners, which I find to be indispensable, to stop barbecuing, which I find to be delicious.

Do you dispute that industrial boilers and coal-fired power plants are two of the largest emitters of hazardous air pollution in the nation?

As I noted in my testimony, that depends on the HAP. The relevant question however should be: do industrial boiler and coal-fired power plants make a significant contribution to exposures to HAPs in concentrations sufficient to constitute a significant threat to human health or the environment?

Do you dispute that they should be exempted from regulation or given more lax treatment under section 112 of the Clean Air Act, when over 150 other industrial sectors have sharply cut their hazardous air pollution under the 1990 amendments?

I do not believe that industrial or utility boilers should be exempted from regulation or given more lax treatment than any other sector regulated under section 112 of the Clean Air Act. I also do not believe that industrial or utility boilers should be treated more severely than the other 150 industrial sectors subject to NESHAPs.

That is the crux of the matter. NESHAPs developed under the Clinton and Bush administrations were tough, but ultimately achievable. This industrial and coal boiler NESHAPs are much more onerous and – in many cases practically unachievable – than any other NESHAP. Standards for new sources are so ridiculously stringent that these rules amount to a ban, in everything but

name, on the construction of any new coal fired generation assets in this country. Not only is that bad economic policy, it's bad environmental policy, assuring that aged coal-fired assets will not be replaced by more modern, efficient and cleaner units.

There is ample testimony in the docket that speaks to the ways that Boiler MACT is different, and more onerous, than other NESHAPs. I would urge the committee to review the docket and to talk to the hard-working Americans in our industrial sector whose lives will be affected by this rule.

Question 4

Addressing industrial sources of air toxic emissions, it is stated that ""The cancer risks associated with air toxics are real, and yet the three largest industrial sources of many of these toxic pollutants (electric generating facilities, cement plants, and industrial boilers) remain uncontrolled at the federal level until as late as 2012". The following question is then posed:

In your opinion, and based on the most recent National Air Toxics Assessment and other information that we invite you to identify, how close are we to reaching the goal of reducing cancer risks to less than 1 in 1 million established by Congress in the Clean Air Act Amendments of 1990?

It will come as something of a shock to the owners and operators of electric generation facilities, cement plants and industrial boilers that were required to install add-on controls under federally enforceable Prevention of Significant Deterioration (PSD) construction permits and that are required to operate, monitor and regularly test those devices under federally enforceable Title V permits that their facilities are "uncontrolled at the federal level". Based on my experience, the billions that those industries have invested in baghouses, electrostatic precipitators, scrubbers, selective catalytic reduction units and other such devices would qualify as "control" and the nature of their permits would qualify as "federally-controlled control".

It is accurate to say that the controls installed have been primarily been installed to address criteria pollutant emissions. However, the majority of these devices will also control emissions of toxic air pollutants as a happy side benefit. For example, the particulate control devices that are currently installed on electric generating facilities, cement plants and industrial boilers -- and I don't know of any of solid fuel-fired electric generating facility, solid-fuel fired industrial boiler, or cement kiln that doesn't control particulate emissions -- remove the vast majority of toxic metals from the gas stream before the gas stream enters the atmosphere. It is thus incorrect to describe these sources as "uncontrolled" or to imply that rules like Boiler MACT will cause such sources to control emissions for the first time.

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What these rules actually do is to force certain existing facilities to install new, more expensive controls in order to achieve an incremental reduction in certain air toxics and to help President Obama fulfill his pledge to make it impossible to construct a modern coal boiler in the United States.

I am not qualified to address the question of how close we are to achieving the 1 in 1 million cancer risk goal, or whether we have in fact achieved it already. In my experience people who perform risk assessments layer on so many margins of safety in the interest of performing conservative assessments that any objective analysis of the “real risk” differs from published data by an order of magnitude or more. In the case of the USEPA, I would note that it is never wise to allow an organization that has an interest in the outcome to act as one’s own gatekeeper when it comes to vetting studies of this sort. I have faith in EPA’s ability to develop objective data with regards to emission rates and ambient air concentrations of air pollutants. However, I do not trust the Agency to evaluate risks associated with this data, or to develop unbiased and complete risk/benefit analyses.

Whatever the real (as opposed to reported) risk that air toxics represent, the extent to which industrial boilers, utility boilers and cement plants contribute to that risk should not be measured by the raw amount of air toxics emissions associated with those industries, but by their proportionate contribution of the specific compounds deemed to represent a risk in those areas where an unacceptable risk associated with a particular compound is found to exist.

I hope these answers are useful to the Committee. As always, I will be happy to help the Committee in the future in any way I can.

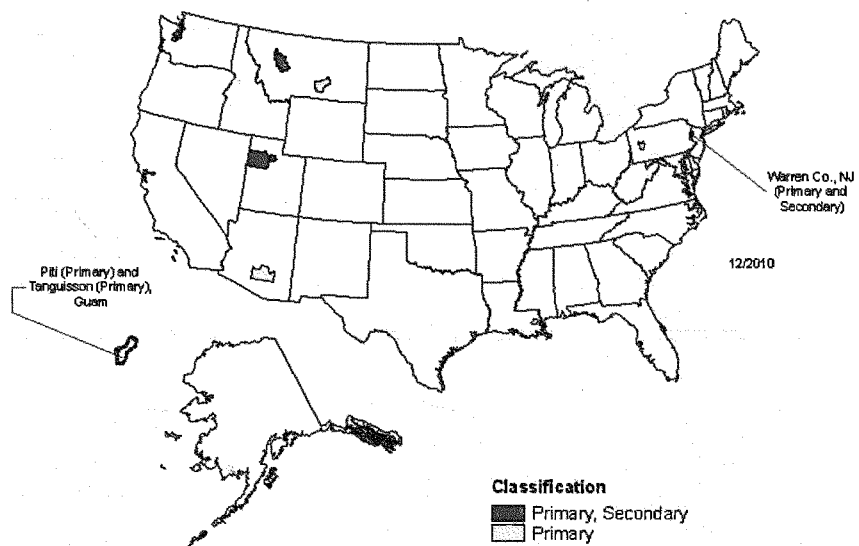
Respectfully Submitted,



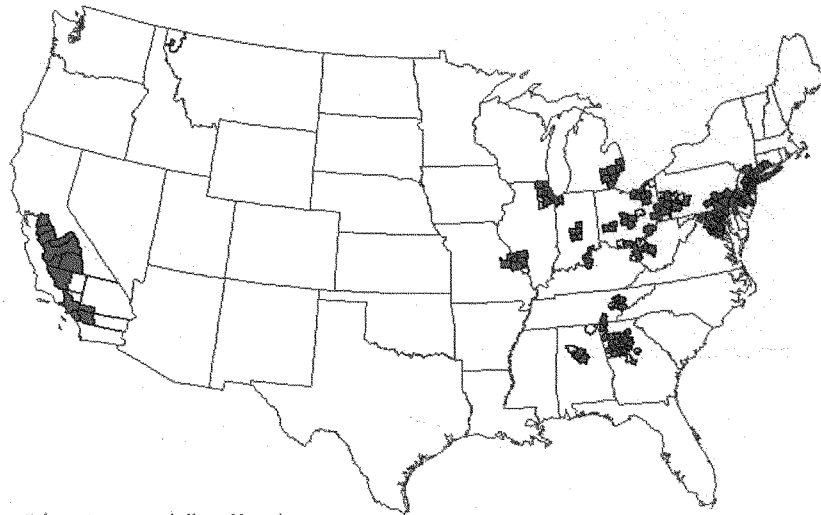
Rich Trzupek

Appendix

Non-Attainment Area Maps

Counties Designated Nonattainment for SO₂

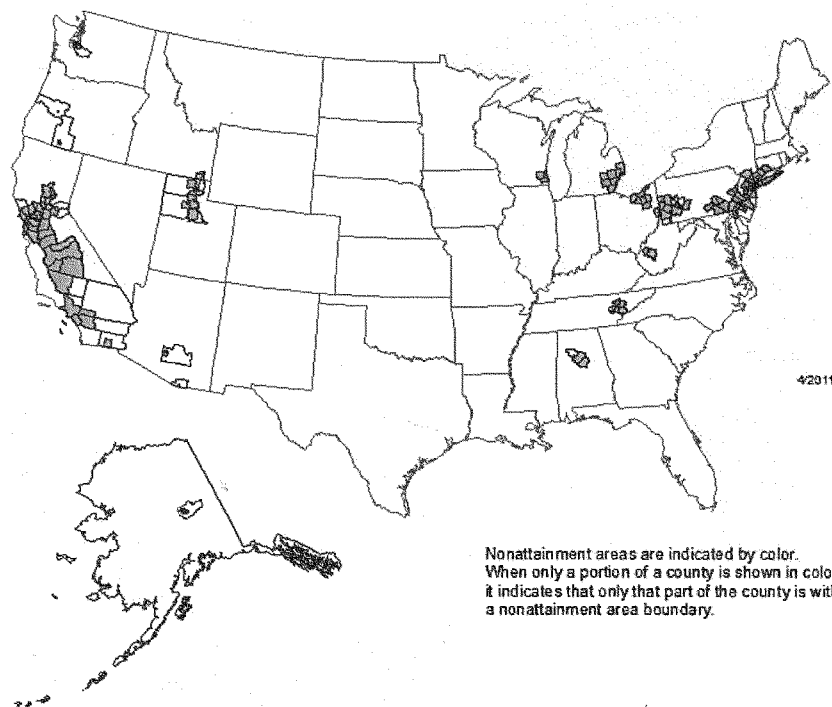
Classification colors are shown for whole counties and denote the highest area classification that the county is in

PM-2.5 Nonattainment Areas (1997 Standard)

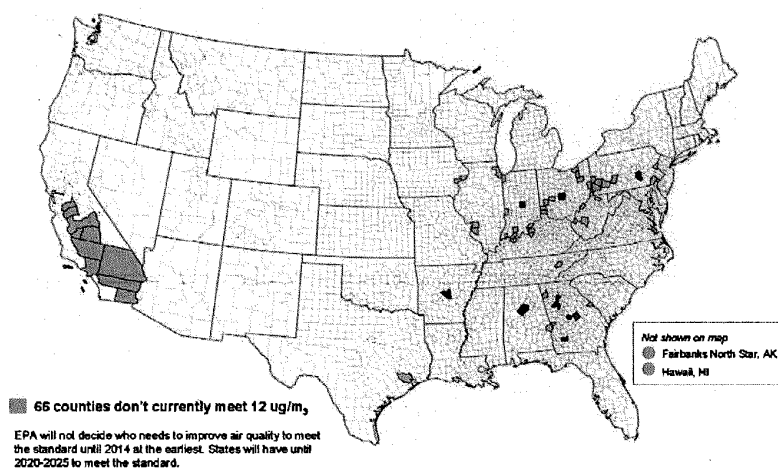
Nonattainment areas are indicated by color.
When only a portion of a county is shown in color,
it indicates that only that part of the county is within
a nonattainment area boundary.

3/2012

PM-2.5 Nonattainment Areas (2006 Standard)



Most of the U.S. Already Meets the Annual Fine Particle Health Standard of $12 \mu\text{g}/\text{m}^3$



Source: 2000-2011 air quality data as of July 15, 2012
 For more information: www.epa.gov/oaqtm

Richard J. Trzupek

May 30, 2013

The Honorable Chris Stewart, Chairman
Environment Subcommittee
House Science, Space and Technology Committee
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Stewart,

I am pleased to respond to your and Congressman Rohrabacher's questions regarding my testimony of February 14 and I apologize for my tardiness in sending you this response.

Question 1:

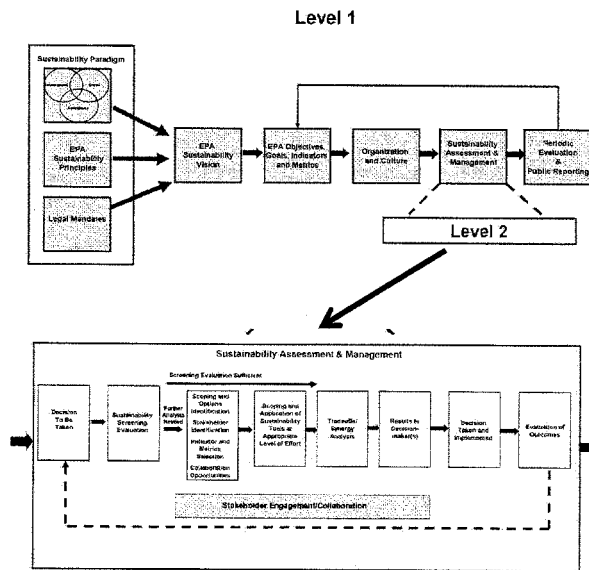
A National Academy of Sciences panel convened by EPA made recommendation on how the Agency could incorporate "sustainability" into all of its decisions. The resulting report has become known as "the Green Book". Since then, the EPA has pledged to follow these recommendations and "incorporate sustainability principles into our policies, regulations and actions." Do you have any concerns about this new EPA policy?

I have read the document in question and I am very concerned about this EPA policy for a number of reasons. Among those reasons is that NAS recommends that EPA should expand its regulatory efforts so as to include economic and social considerations in its decision-making process. To quote from the report:

"The agency should develop a tiered formalized process, with guidelines, for undertaking the Sustainability Assessment and Management approach to maximize benefits across the three pillars and to ensure further intergenerational social, environmental, and economic benefits that address environmental justice."

I do not believe that the EPA is capable of, nor has the expertise to, address social and economic issues. In a free society excessive meddling in social and economic spheres is to be avoided except when absolutely necessary, and expecting an agency whose personal and mission have little or nothing to do with social and economic issues seems to me a sure recipe for failure.

In addition, I find the decision-making "framework" proposed by NAS ludicrously complex, such that it practically invites bureaucratic abuse and crony capitalism. As recent events have amply demonstrated, complex bureaucratic frameworks are more easily abused by officials prone to push their own agenda. I would ask the Committee to review the following flow charts included in the NAS report that outline the proposed EPA decision-making process:



To me, this type of process does not appear to be designed to protect the environment, but rather to justify micro-management aspects of society that have heretofore never been the subject of regulatory interference.

I would like to close my answer with a quotation from the late Julian Simon of which I am particularly fond: "More people, and increased income, cause resources to become more scarce in the short run. Heightened scarcity causes prices to rise. The higher prices present opportunity, and prompt inventors and entrepreneurs to search for solutions. Many fail in the search, at cost to themselves. But in a free society, solutions are eventually found. And in the long run the new

developments leave us better off than if the problems had not arisen. That is, prices eventually become lower than before the increased scarcity occurred.”

I believe that history has proven Simon correct time and time again, and I think it would be the height of folly to abandon the free-market principles Simon espoused in favor of misguided, ineffective and ultimately counter-productive efforts to impose further bureaucratic micromanagement under the guise of “sustainability”.

Question 2:

One of the things we have increasingly heard, over the past decade or so, is that the science is being politicized by the EPA: we have heard accusations that President Bush manipulated the science and irresponsibly undermine the case for more regulations, and more restrictive regulations; and now we hear accusations that President Obama manipulates the science to maximize the expected impacts and irresponsibly the case for more regulations, and more restrictive regulations.

The scientific integrity guidelines, the boards, the review process and other checks don't seem up to the task of preventing these problems and concerns. And, although less publicized, the EPA's economic analyses are also open to these manipulations.

Is there a way we could better separate the scientific process from the regulatory process to minimize the opportunities for politicization and manipulation? And, is there a way to separate the economic analysis as well?

I think the basic problem goes deeper than what happens at the EPA. By time the EPA gets its hands on an issue and begins to develop its own technical rationalization for whatever it would like to do (or not like to do), the science has often been hopelessly corrupted. The manner in which research grants are awarded, the nature of groups awarding many of these grants and the involvement of special-interest groups in focusing research goals often combine to corrupt science at a basic level when public policy issues are involved.

I don't mean to say that scientists at the university or think tank level are *deliberately* falsifying data, but rather that research involving public policy issues is often so narrowly-focused or so speculative as to be of little value in real-world terms. A scientist can produce a paper on the potential effects of increasing global temperatures on the life-cycle of the monarch butterfly, for example. This paper will then be added to the pile of research that supposedly supports anthropogenic global warming (AGW) theory, even though it the data didn't actually speak to the veracity of the climatic conditions that AGW theory predicts.

Political agendas have - unfortunately - corrupted science at all levels whenever the science in question has intersected with public policy. This is not just an EPA problem, it's a modern society problem and I don't see it getting any better. As our society becomes more technically

complex – as it inevitably does – the potential for abuse of this type necessarily increases, because the public, the media and most of our representatives have less and less personal understanding of the scientific nuances. In absence of personal understanding, everyone relies on the “experts” and in a world where an “expert” can be found to validate any policy-objective one happens to have, real science falls by the wayside.

Unfortunately, I don't know how to fix the system. I only know that it's badly broken. And, if I were to suggest anything at all, I would suggest that the Committee begin to look at how basic data is developed at the grass roots level when public policy issues are involved and work up from there.

Thank you again for the opportunity to contribute to the Committee's important work. Please contact me again in the future if I may be of further assistance.

Respectfully Submitted,

Rich
Trzupek

Richard Trzupek

*Responses by Dr. Bernard Goldstein*Response to the Questions of the Honorable Chris Stewart and the Honorable Dana Rohrabacher

Bernard D. Goldstein, MD

March 20, 2013

I thank Congressman Stewart and Congressman Rohrabacher for the opportunity to respond to their important questions. Many of my responses concerning the nature of environmental health science are pertinent to both of their questions, but for brevity's sake I will not repeat myself.

Response to Congressman Stewart

Congressman Stewart specifically asks me to expand on why I strongly oppose access to raw data sets used in regulatory actions by EPA. In my view this is an extraordinary bad idea that is based on misunderstanding of how scientific judgments are made, and particularly on how science contributes to the regulatory process. It will sow doubt that will further slow down our regulatory process and will contribute to the uncertainty that industry dislikes and that hurts our competitiveness. Further, it will lead to a marked diminution of the strength of our nation's environmental health science programs and lead to American regulation being driven by science from other countries.

At your hearing the majority members and witnesses repetitively cited the many improvements in our nation's environment. What was not acknowledged was that these improvements were driven by the scientific findings that led to action. In every single case, industry fought these scientific findings. In every single case industry was able to find hired guns to reanalyze the findings so as to claim that they were erroneous. In every single case the doubt sowed by these industry-funded erroneous claims led to slowing down the needed action – action which the majority now approves of. In retrospect, these actions should have been taken earlier to maximize the benefits to the American public – and to minimize the costs to our industry. We often hear about the importance to industry of clarity in our laws and regulations so that they can confidently plan and operate in the United States. There are many causes of this lack of clarity. One is the propensity of all sides to throw doubt on the underlying science. Allowing every scrap of raw data to be reanalyzed by any potentially affected party will increase this doubt, cause further delay, and increase the likelihood that new industry will develop in countries that are more able to rapidly assimilate new science. It will lead to American industry continuing to squander money on reanalyses and on legal maneuvering rather than getting on with the job of leading the world in developing the replacement and control technologies that is to everyone's benefit.

The argument for release of all raw data is based on a common misconception about the scientific process. Peer review leading to publication in the scientific literature is far less important as a basis for action than is replication by other peer-reviewed science. For the process of setting National Ambient Air Quality Standards (NAAQS), which was a major focus of the hearing, the Congressionally-mandated Clean Air Scientific Advisory Committee (CASAC) has a long history of carefully reviewing all of the published literature on the specific air pollutant under consideration. I am unaware of any instance in which a single unreplicated study was the sole basis for a CASAC recommendation. In my testimony I intentionally chose to highlight a recent Canadian study using a different data base and different

methodology that corroborated US studies of the adverse effects of fine particulates. I could have chosen many other international studies, as well as a plethora of US studies, that reinforce these findings. It is most unfortunate that US industry has chosen to spend its money fighting these studies rather than responding by taking the lead in developing the control technology that is now being adopted throughout the world, including the United States. Providing industry with the opportunity to squander more funding in this manner neither advances our scientific understanding of how to protect the public, nor improves our economic competitiveness.

Let me emphasize that not all published scientific findings of potential regulatory impact are replicated. I had the honor of being the principal investigator of the very first grant funded by the Health Effects Institute. It was successful in refuting the published data suggesting that African-Americans with a deficiency in red blood cell glucose-6-phosphate dehydrogenase (G6PD) were particularly susceptible to the air pollutant ozone. As this genetic variation is present in one out of seven black males in the United States, G6PD deficient individuals would qualify as a sensitive population as defined by Congress in the Clean Air Act, and replication of the finding of increased sensitivity could have had a substantial impact on the ozone standard. Instead, we were able to convincingly refute these findings and one no longer hears about this issue. Further, contrary to the nonsense we hear about some cabal among scientists to only support scientists who are anti-industry, neither this finding, nor my service as a political appointee of President Reagan as EPA Asst Administrator for Research and Development, have hurt my career. In fact, being able to refute bad science is an advantage to any scientific career. This refutation of the inaccurate attribution of sensitivity to ozone of G6PD deficient individuals is just one example of the many occasions in which a published finding suggesting the need for more stringent regulation has been refuted by further scientific study. As I pointed out in my written testimony:

“Contrary to the repeated erroneous statement that the NAAQS standards are routinely tightened, in the large majority of times the scientific review has led to no change in the existing standard, and at times has even led to relaxation or elimination of standards”

As just one example, the ozone standard was relaxed during the Carter administration.

Another major reason to oppose the promiscuous release of raw data is the adverse impact it will have on the environmental health science programs that have been so valuable in achieving the understanding necessary for the clean air and clean water accomplishments that you and your colleagues have so appropriately emphasized. First, let me point out that inherently any single epidemiologic or ecologic research study can not be perfectly controlled. Neither humans nor grasshoppers can be totally ruled by experimental design. And this is as true for medical epidemiology as it is for environmental epidemiology. Statisticians evaluating such research have learned to distinguish between blemishes and scars; between those minor glitches that are not likely to impact on the interpretation of the study, and those which can seriously confound understanding the findings. However, it is the role of advocates to magnify the minor blemishes. This will inevitably occur, and will just as inevitably mean that scientists who publish such a study will need to spend all of their time refuting the ballyhooed blemishes which are being used to impugn their scientific skills. Under such

circumstances it would be foolish of any scientist to get involved in doing research that might have regulatory impact. Just the time spent on reanalyzing the reanalysis would cripple an academic career.

To put it bluntly, if all raw data were required to be made available, it would be inappropriate for senior academic scientists such as myself to continue to guide young academic scientists into environmental health science as a career. These young scientists would never have the time to develop their academic program because defending just one paper so attacked for blemishes would severely impact on their ability to develop other research projects necessary for them to move forward in their field. And, as I pointed out above, it is replication that is needed. The failure of other scientists to replicate the scientific findings of a scientist should impact on his or her career – but not the overblown analyses of those hired to falsely convert the inevitable blemishes into unsightly scars

Note that the result of requiring the provision of all raw data will be to drive such research out of the United States. As I point out above, the Canadian study cited in my testimony is only one of many such studies globally. There is nothing in the Clean Air Act that requires CASAC to only look at published papers from the United States, and it would be both anti-scientific and exceptionally parochial to do so. I can assure you that, just as it is true for medicine, there is an increasing volume of environmental health research pertinent to the United States being performed all over the world, with many of the researchers being trained in excellent US institutions. In recent decades European nations, Canada and Japan have all dramatically increased their funding of environmental health research. We are increasingly seeing peer-reviewed environmental health research coming from rapidly developing countries such as India, China, South Africa, and Brazil. I personally have been involved in the past decade in helping a new program develop in Malaysia and seeing it grow to the point that one of my young colleagues, Dr Jamal Hisham Hashim of Universiti Kebangsaan Malaysia, was recently invited to speak at a meeting of the Institute of Medicine Roundtable on Environmental Health.

So what would Congress do to obtain the raw data of researchers from around the world funded by their own countries? Require that EPA could only consider the findings of such published studies if the researchers would be willing to keep all of their raw data and turn them over to any American who wanted it – and only because at some subsequent date CASAC would cite their paper? I most certainly would not turn over my raw data to another country because they wanted to use it in a regulatory decision. Nor would I expect anyone else from another country to do the same. This could only happen if there were reciprocal agreements with other countries – and I do not believe that Congress wants to require US scientists to give their raw data to any other country. But that is where the thoughtless approach some are advocating would take us. Further, after subjecting them to this abuse, how would we develop the American scientists needed to review the world's literature for regulatory purposes?

The choice facing Congress is stark. Our nation can obtain the information necessary to maximize the benefits and minimize the risk of our technological prowess through supporting a strong independent research enterprise; or we can destroy this research enterprise by subjecting it to the harassment of those beltway nitpickers who do the bidding of whatever financial interest has hired them. Congress

can insure that the best possible science is used for regulation by providing the funding to replicate the findings, using different investigators and different data sets.

Response to Congressman Dana Rohrabacher

Congress Rohrabacher has asked the important question of how best to minimize the opportunities for politicization and manipulation of the scientific process and the economic analyses that impact on regulation. To answer that question we must first recognize the inherent difference between how scientific process seeks to come to judgment about what science is telling us, and the legal process seeks to obtain and use scientific information. We scientists are much more comfortable with consensus processes that balance the judgments of different scientists from different disciplines who are reviewing a body of scientific opinion pertinent to a regulatory or other decision. (Note that the process is similar for an NIH consensus panel looking at the appropriate age to recommend mammography, or an FDA panel giving advice about a new pharmaceutical agent). In contrast, an ethical well-trained lawyer has the duty of looking for individual scientists at one end of the opinion spectrum knowing full well that the lawyer on the opposing side will be doing the same at the other end of the spectrum. These contrasting approaches are a fact of life, but once understood the situation is manageable. In my view it has been managed reasonably well by EPA, although it inevitably leads to the criticisms described in Congressman Rohrabacher's question.

My contention that there is an inevitable conflict between the legal and the scientific cultures that are both at play at EPA, does not lessen the importance of Congressional oversight to be sure that the scientific process continues to be managed fairly and objectively. However, I respectfully suggest that those who think that the process is broken need to do more than wave their hands about. They need to provide an analysis of those regulatory decisions that have turned out to be based on bad science that made its way through EPA's extensive peer review process, and that led to some economic or environmental health cost that could have been avoided if the process was corrected. What I have heard so far is anecdotal, and reminds me of an adage we teach to our public health students. It goes as follows:

I know that Boy Scouts always march single file. I know this because I saw one once.

I am not claiming that EPA's processes of scientific review are infallible. But I do know that they are sufficiently admired that they have been adopted in many international settings. In my view, the critics bear the burden of proof that EPA's processes for incorporating science into regulation need correction, including a thorough analysis of the potential problems and the potential solutions.

One proposed solution to the alleged problem is to administratively separate science and technology from EPA, in essence to remove the Office of Research and Development to another agency with no direct oversight by the regulatory side of the agency. The evidence that this is a very bad idea comes from an experiment devised unintentionally by Congress over 40 years ago when it almost simultaneously formed EPA with its own R&D program and OSHA with a separate R&D program in a

completely separate federal agency (NIOSH in HHS). The proponents of separating science from EPA would first need to explain why over these many decades EPA has done so much better than OSHA in developing science-based regulations.

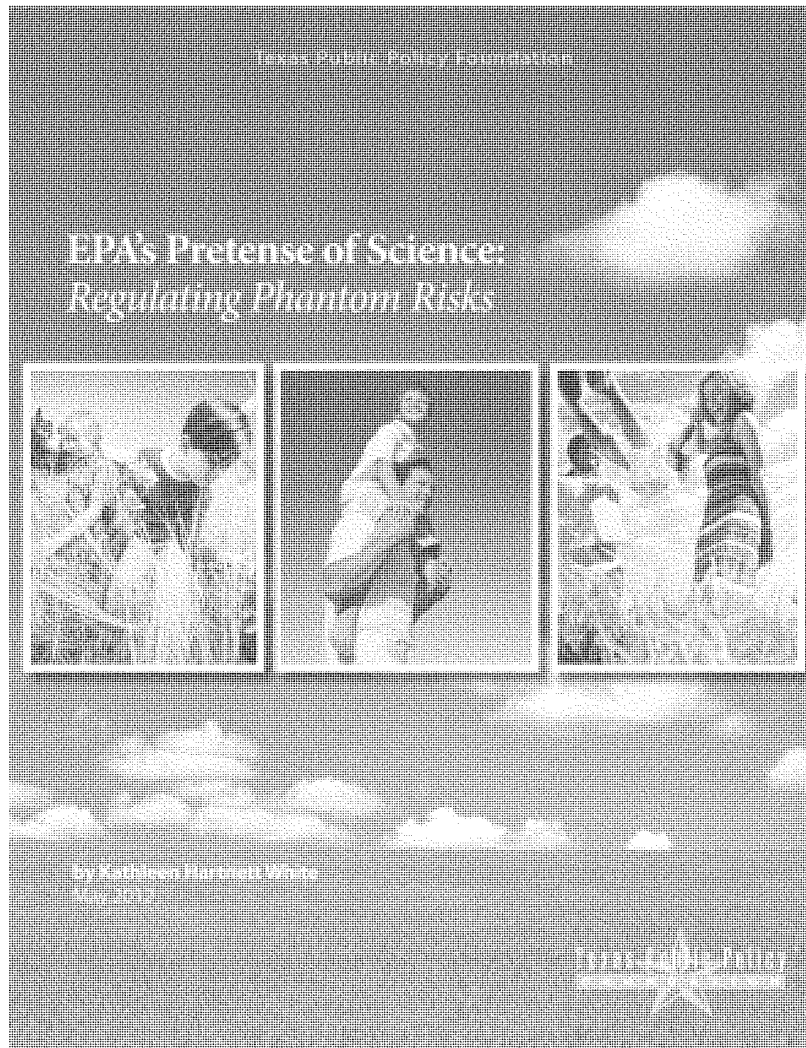
Finally, my view on economics is that it is a science and its review should be treated similarly to that of other scientific disciplines that underlie EPA's regulatory decisions.

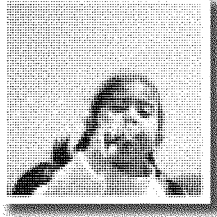
Thank you for the opportunity to testify in front of the Committee and to respond to these questions

Appendix II

ADDITIONAL MATERIAL FOR THE RECORD

EPA'S PRETENSE OF SCIENCE: REGULATING PHANTOM RISKS
SUBMITTED BY THE HONORABLE KATHLEEN HARTNETT WHITE





May 2012

Texas Public Policy Foundation

by Kathleen Hartnett White

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The EPA's Pretense of Science: Regulating Phantom Risks

by Kathleen Hartnett White

Preface

I write this paper on the U.S. Environmental Protection Agency's (EPA) misuse of science from my six-year former experience as a final regulatory decision-maker for the Texas Commission on Environmental Quality (TCEQ), the world's second largest environmental regulatory agency after the EPA itself. I was a commissioner and chairman, of TCEQ from 2001-2007. My responsibility for making final decisions on regulations, permits, and enforcement actions necessarily involved my judgments about the rigor, accuracy, and relative uncertainties in diverse scientific studies, statistics, modeling protocols, and technical analyses. I viewed this "science" as a critical tool to inform—but not to dictate—what were ultimately legal and policy decisions.

Various members of the scientific community claim that non-scientists, like me, cannot challenge the credibility of the EPA's use of science. This view maintains that only credentialed scientists can critique the work of other credentialed scientists. If that is the case, so much the worse for representative democracy.¹ Government by popularly elected representatives on the one hand and government by federal administrators swearing by the authority of science, on the other hand, are contradictory notions. I would call the latter, moreover, an acutely dangerous notion. Regrettably, in the modern United States these two incompatible policy-making models clash often, and with dire results. Elected officials trying to carry out their public duties—e.g. maximizing access to clean, affordable energy—meet stubborn opposition from federal mandarins brandishing their scientific credentials. The magnitude of the EPA's current regulatory agenda has elevated the importance of these issues.

In my efforts to understand the science on which the EPA grounds its regulatory decision, I am indebted to two notable scientists who have patiently educated me over many years: Dr. Michael Honeycutt, chief toxicologist at TCEQ, and David Schanbacher, P.E., former chief engineer at TCEQ, now director of natural resources for the Texas Comptroller of Public Accounts. I am also grateful for two recent papers which astutely unwind the tangled scientific web now supporting the EPA's historically "unprecedented regulatory spree."² My analysis draws heavily on these papers written, respectively, by Dr. Anne Smith of National Economic Research Associates and Dr. Tony Cox, president of Cox Associates.

- Anne Smith, Ph.D., "An Evaluation of the PM 2.5 Health Benefits Estimates for Regulatory Impact Analysis of Recent Air Regulations," NERA (Dec. 2011).
- Louis Anthony (Tony) Cox, Jr., "Reassessing the Human Health Benefits from Clean Air," Risk Analysis (Nov. 2011).

Introduction

As my late father frequently pointed out (and in a poignant sense proved), "no one gets out of this alive." Human life is certain to end and is fraught with dangers. Yet life in the 21st century United States is far safer than ever before. Medical science and disease prevention have dramatically reduced, if not eliminated, many disabling and fatal diseases. Life expectancy steadily increases. In highly developed countries like the United States, the most dangerous environmental risks to human life from contaminated water and air have been virtually eliminated.

The U.S. Environmental Protection Agency (EPA), nevertheless, would have Americans believe that hundreds of thousands will die unless its new and unparalleled regulatory agenda is enacted. The EPA undertakes to "protect" us through rules costing many billions of dollars and with cumulative impacts jeopardizing the nation's electric power supply and millions of jobs. The agency confidently justifies these costs on the value of "preventing deaths" from exposures to a single pollutant rarely considered by physicians to be a killer! The pollutant is known as fine Particulate Matter 2.5 (PM 2.5). See *Sidebar: What is Particulate Matter?*

After dramatic improvement in air quality and ever-stricter federal air quality standards now approaching natural background levels (see *Figure 1*), the EPA, in order to justify more stringent regulation, recently devised a method to create a vast reservoir of new health risks. Under the cloak of selective, highly uncertain science driven by implausible assumptions, the EPA now declares that additional regulations are necessary to save thousands of lives. The EPA Administrator Lisa Jackson's inflammatory claims regularly deceive the public. On "Real Time with Bill Maher," she grimly warned that "We are actually at the point in many areas of the country ... the best advice is don't go outside. Don't breathe the air. It might kill you."³ In similarly hyperbolic vein, she told a congressional committee: "If we could reduce particulate matter [pollution] to levels that are healthy, it would have identical impacts to finding a cure for cancer."⁴ This astounding assertion by the head of the EPA demands meaningful explanation. In recent years, cancer has caused the deaths of approximately 600,000 people per year.

This paper aims to demonstrate how several highly questionable assumptions have enabled the EPA to assign health risks at extremely low concentrations of PM 2.5—levels now well

Sidebar: What is Particulate Matter (PM)?

Particulate matter (PM) is a fancy word for natural dust and for the microscopic particles released from man-made activities, especially combustion. PM is everywhere present on the crustal planet earth from natural and man-made sources. To the EPA, particulate matter (PM) is one of the six criteria pollutants regulated under the federal Clean Air Act through National Ambient Air Quality Standards (NAAQS) established by the EPA at a level adequate to protect public health.

PM includes both small solid particles and liquid droplets in the air we breathe. The fine particles in question are minute and measured in microns (micrometers). The width of an average human hair is 70 microns. "Because particles are the byproduct of everything we do in an industrial society as well as natural processes like wind, erosion, forest and brush fires, they are everywhere."⁵ Industrial processes like rock crushing, common domestic activities like cooking, sewing, grilling, wood-burning, combustion of transportation fuels, and farming continually generate PM. Living on a planet composed of dirt, stone, and plants makes PM a ubiquitous component of human life.

The EPA does not distinguish between PM from natural sources such as dirt roads and tilling croplands and PM from urban and industrial sources. Urban PM is likely to be enriched with pollutants with a chemical content potentially more hazardous than natural dust. In spite of many scientific studies stressing this distinction, the EPA still assumes all PM carries the same health risks and regulates accordingly.

The EPA has established a NAAQS for two different sizes of PM: a standard for coarse PM measuring between 2.5 and 10 microns and a standard for fine PM 2.5 microns and lower. The current 24-hour standard for coarse PM 10 is 150 micrograms per cubic meter (ug/m3). The 24-hour standard for PM 2.5 is 35 ug/m3 and the annual standard for PM 2.5 is 15 ug/m3. Although many health-effects studies do not find adverse effects at current levels of PM, the EPA concludes the fine particles (PM 2.5) still pose health risk by irritating or damaging the minute air sacs in the lungs called alveoli. Many toxicological studies, however, find that the natural cleaning system in the lungs removes the minute solids.

Figure 1: Air Quality Improvement 1980-2010

	Ambient 1980-2000	Ambient 1980-2010	Conservative 1980-2000	Conservative 1980-2010
Carbon Monoxide (CO)	-73%	-82%	-50%	-77%
Ozone (O3)	-25%	-28%	-49%	NCD
Lead (Pb)	-92%	-90%	-96%	-97%
Nitrogen Dioxide (NO2)	-46%	-52%	-40%	-52%
Particulates (PM10)*	-31%	-38%	-46%	-83%
Fine Particulates (PM2.5)**	-21%	-27%	-36%	-55%
Sulfur Dioxide (SO2)	-71%	-76%	-52%	-80%

NCD = No Current Data
 *1990-2010
 **2000-2010

Source: Environmental Protection Agency, "Air Quality Trends," Jan. 2012.

below the already precautionary federal standard for PM 2.5. These key assumptions include: 1) Ambient PM 2.5 causes premature death; 2) There is no threshold concentration of ambient PM 2.5 below which risk of premature death ceases; 3) Aggregation of statistical risks is a meaningful surrogate for a human life; and 4) Coincidental reduction of PM 2.5 offers legitimate justification for regulatory initiatives targeting other pollutants.

The EPA is relying almost exclusively on coincidental reduction of PM 2.5 to justify the many new regulations collectively known as the EPA "train-wreck" rules.⁶ For example, 99.996 percent of the health benefits supporting the mercury rule derive from coincidental reduction of PM 2.5. Direct reduction of mercury accounts for only 0.004 percent of the rule's benefits. Without using the inadvertent reduction of PM 2.5 as a hoist, the costs of these new regulations would far surpass their direct benefits. This practice shields the EPA's rules with few measurable benefits from scrutiny. Further, it subverts the purpose of cost-benefit analysis.

Benefits and Costs of the Clean Air Act from 1990-2020: The Benefits Study

Most of the country already achieves the health-based National Ambient Air Quality Standard (NAAQS) for PM 2.5. Under the federal Clean Air Act, the NAAQS for PM 2.5 and the five other "criteria pollutants" must be set at a level req-

uisite to protect human health with an extra margin of safety *and regardless of cost*. Thus, the NAAQS are extremely conservative, precautionary standards. "It can be argued that the 1970 Clean Air Act effectively operationalized the absolutist version of the precautionary principle."⁷ Although variously defined, the precautionary principle generally means that with risk of grave, however improbable, harm, and regardless of uncertainty or cost, regulatory intervention is justified.

Since 2009, the EPA has applied a far more precautionary approach than is articulated in the CAA for the health-protective NAAQS. In risk assessments and analyses of the cost and benefits of regulation, the agency no longer regards the ambient pollutant levels set by the NAAQS to be fully protective. The EPA is now attributing risk of premature mortality at PM concentrations approaching and below natural (and thus unpreventable) background levels. Similarly, the EPA is now justifying almost all of its many new air quality regulations on the basis of coincidental reduction of PM 2.5 in rules not intended to address PM 2.5.

This EPA is obsessed with PM 2.5—a criteria pollutant many scientists and regulators believe has already been reduced to healthy levels. To the EPA, however, existing levels of PM 2.5 pose risks to death on a par with cancer! A closer look at an EPA study issued in 2011 reveals the questionable methodology and assumptions behind the EPA's pre-occupation with

ambient PM 2.5. This study, "Benefits and Costs of the Clean Air Act: Second Prospective Study, 1990-2020," projects the benefits and the costs of the 1990 amendments to the CAA.⁸

The executive summary reveals the EPA's new methodology. Here the EPA attributes 85 percent of the health benefits projected over the study period (1990-2020) to reduction of ambient levels of PM 2.5. This "Benefits" study finds that CAA regulation will "save" 230,000 lives in 2020.⁹ The EPA monetizes the value of those saved lives at nearly \$2 trillion but estimates the direct compliance costs at a comparatively paltry \$65 billion. The EPA implies that the public pays only \$1 dollar for every \$30 dollars in health benefits as a result of additional reduction of ambient PM 2.5. Over 90 percent of the \$2 trillion derives from alleged prevention of "premature mortality"—roughly equivalent to shortened life expectancy.

The EPA further imputes the equivalent of 100 percent certainty to the nearly \$2 trillion valuation of the benefits proposed to result from preventing over 230,000 early deaths. "The wide margins by which benefits exceed costs combined with *extensive uncertainty analysis* suggest it is very unlikely this result would be reversed using any reasonable alternative assumptions of methods."¹⁰ (Emphasis added) It's a great

return on investment—\$30 for every \$1 put in. Moreover, it's a sure thing.

If the EPA's claims about saving lives and gaining trillions of dollars in benefits were factually true, the case for its aggressive regulatory agenda would be compelling. How can society worry about higher electric rates or losing American jobs and businesses to foreign shores when thousands of human lives are at stake? The numbers, however, are so high—such an inflation from previous analyses of PM 2.5 impacts—and so lacking in credible explanation from the EPA that they exceed the bounds of credibility.

Peeling back the layers of assumption on which the EPA's massive benefits depend, one finds that the EPA's claims are misleading at best, deceptive at worst. What the Benefits study calls an "extensive uncertainty analysis" amounts to an assumption in a cherry-picked model that precludes any other conclusion than a 100 percent probability.¹¹ Dr. Tony Cox paraphrases the EPA's claim stating: "Assuming that I am right, it is extremely unlikely that any reasonable combination of alternative assumptions would show that I am wrong."¹² This is what in logic is called begging the question.

Sidebar: Cost-Benefit Analysis

Cost-benefit analysis, a basic component of Regulatory Impact Analysis (RIA), has long been used to assess the relative advantages or benefits of proposed regulation in comparison to the relative burdens and monetary costs of complying with the regulation. Under an Executive Order issued by President Ronald Reagan in 1981, federal agencies must submit to the White House Office of Management and Budget (OMB) a cost-benefit analysis for all proposed "economically significant" rules. A regulation carrying annual compliance costs of \$100 million or more is subject to this requirement.

If objectively and comprehensively conducted, cost-benefit analysis should provide key information to regulatory decision makers, elected policymakers, and the public. And while a full RIA should contain a variety of data and analyses, the cost-benefit analysis is a key conclusion. OMB's current guidance highlights the essential role of cost-benefit analysis in a democracy where regulatory coercion should be the exception and not the rule.

"Regulatory analysis is a tool regulatory agencies use to anticipate and evaluate the likely consequences of rules. It provides a formal way of organizing the evidence on the key effects, good and bad, of the various alternatives that should be considered in developing regulations. The motivation is to: 1) learn if the benefits of an action are likely to justify the costs, or 2) discover which of various possible alternatives would be the most cost-effective."¹³

Under past and present administrations, the EPA has monetized both sides of the cost-benefit equation. The costs are an estimate of the direct costs of compliance incurred by the regulated entity. The benefits typically are an estimate of a dollar-value of the avoidance of morbidity (illness) or premature mortality (shortened life span). The EPA has used diverse methodologies to monetize "work days not lost" or "living longer" but the numbers have become so speculative and inflated as to have no meaningful predictive value.

Assumption I: PM 2.5 Causes Premature Mortality, a/k/a Early Death

The main premise behind the EPA's promise of massive health benefits from additional regulation is that PM 2.5 causes premature mortality or reduced lifespan. But the selective ecological epidemiological studies upon which the EPA relies to make this claim are incapable of establishing a causal link between death and ambient concentrations of PM 2.5. The two studies on which the EPA relies indicate statistical associations between mortality rates and PM 2.5 concentrations in specific cities.¹⁴ These chronic exposure studies exclude accidental death and somewhat "adjust" for other factors such as smoking or obesity but otherwise attribute all non-accidental deaths to PM 2.5.

The EPA then intricately manipulates the statistical associations through models. The studies can show only an association or a concurrence between slightly elevated mortality rates and PM 2.5 levels. They cannot establish causation. As an example, the statistical correlation between higher rates of swimming and heart attacks in summer months in no way "proves" that swimming causes heart attacks. The correlation between higher incidence of hypothermia and purchase of heavy coats during winter months does not mean heavy coats cause hypothermia.

The EPA's "Benefits Study" admits that the question of causation is a *crucial uncertainty* that could lead to "potentially major" overestimation of benefits. "The analysis *assumes a causal relationship between PM exposure and premature mortality* based on strong epidemiological evidence of a PM/mortality association. However, epidemiological evidence alone cannot establish this causal link."¹⁵ (Emphasis added.) After acknowledging this uncertainty, the EPA proceeds to the assumption that PM 2.5 *causes* early death, an assumption made without analyzing the statistical correlations within a causal framework.

Such analytical frameworks exist. Nine analytical criteria, known as the Bradford Hill causal criteria, are widely used by public health scientists to assess whether an observed correlation is or is not likely to be a factual cause.¹⁶ Factors such as biological plausibility and experimental evidence are critical in weighing the health risks from air pollutants. The EPA, on the other hand, imputes complete causal certainty for little reason offered other than the assumption

of causation is consistent with current practice. The EPA's cherry-picked, unvalidated model for the "uncertainty analysis" assigns a probability of 100 percent to the causal connection between PM 2.5 and premature mortality. Such complete certainty is unwarranted by available data and knowledge, as discussed next.¹⁷

The EPA's attribution of the equivalent of 100 percent certainty to the assumption that PM 2.5 causes premature mortality also ignores a huge body of credible scientific studies and unanswered questions about which the EPA is certainly aware. The National Academy of Sciences, toxicologists, statisticians and medical doctors have long challenged the findings of epidemiological studies which claim strong evidence of correlations where no causality in fact exists.¹⁸ As Dr. Michael Honeycutt, the chief toxicologist for TCEQ, pointed out in congressional testimony, "Ecological epidemiological studies are not scientifically rigorous to draw conclusions about the cause of health effects identified in the studies ... and are not suitable for policy decisions."¹⁹

Many confounding variables left unaddressed in the EPA's selected studies weaken the credibility of even the statistical association, much less the assumption of a causal link between PM 2.5 and premature mortality. Typical confounders include the presence of multiple pollutants co-mingled with PM 2.5 in the ambient air, the diverse composition of PM 2.5 (from natural dust to chemically enriched, and perhaps more hazardous, fine particles) across locations, and the question of whether earlier exposures to PM 2.5 at levels far higher than current levels account for cumulative mortality risks later in life. The current ambient levels of PM 2.5 are far lower than the earlier periods to which subjects of the studies were exposed.

The question of exposure is a major confounder in many of the EPA's risk assessments. Yet the EPA typically assumes an unrealistic worst-case scenario of maximum exposure 24 hours a day. The EPA's assumption that all study subjects are equally exposed to the monitored levels of outdoor PM 2.5 is simply not a representative measure of average, actual exposure. Research shows that PM 2.5 concentrations indoors are much higher than outdoor levels. Yet cleaning the closet, vacuuming, cooking or cruising through a department store can hardly be regarded mortal risks.²⁰

The EPA's estimate of the benefits from reducing PM 2.5-caused morbidity (sickness) also ignores key research data to the contrary. The EPA's "Benefits" study projects 2.4 million fewer cases of aggravated asthma in 2020. Medical scientists, however, recognize that respiratory infections, mildew, mites, and pet dander more directly exacerbate asthma than ambient air. And incidence of asthma has increased over the past several decades while concentrations of all CAA-regulated pollutants have declined by over 50 percent.²¹

The EPA also disregards studies that show no or even negative correlations. Some studies indicate reduced mortality risks at higher levels of PM 2.5. A recent analysis of mortality risks from PM 2.5 in 27 U.S. communities found a decrease in mortality rates at increased levels of PM 2.5 for one-third of U.S. cities, including Dallas, Houston, Las Vegas and Riverside, California.²²

Most importantly, the EPA ignores toxicological and clinical studies, which are alone capable of evaluating whether, and to what extent, outdoor concentrations of PM 2.5 may causally impact cardiopulmonary function. Most toxicologists studies contradict the EPA's PM 2.5 risk assessments. "Toxicological data on typical forms of pollution-derived PM strongly suggest that current ambient concentrations in the U.S. are too small to cause significant disease or death. ... The expectation that lives will be saved by reducing ambient PM 2.5 in the U.S. is not supported by the weight of evidence, although other bases for regulating PM may be justifiable."²³

Assumption II: Going to Zero: No Pollutant Threshold Below Which Air is Healthy

In 2009, the EPA made a methodological change with huge ramifications. The agency now calculates mortality risks from PM 2.5 below the health protective level of the NAAQS (presently set at an annual 15 ug/m³). It also calculates them below the lowest measured ambient level (LML) in the original studies and even below natural background levels approaching zero. Remarkably, the EPA now assumes that there is no level of PM 2.5 below which risks to premature death cease. Statisticians call this a "no threshold linear regression to zero analytic model." In laymen's terms, no risk is too low.

Prior to 2009, the EPA did not estimate risks below the lowest ambient level measured in the epidemiological studies. If the PM level in a given location was already below the LML (typically 10 ug/m³), the agency did not assume additional reductions in PM 2.5 would generate additional health benefits. "However, starting in 2009, the EPA decided that it would calculate risks to the lowest level projected by its air quality models, even though no observed or empirical evidence exists ... in that low concentration zone."²⁴

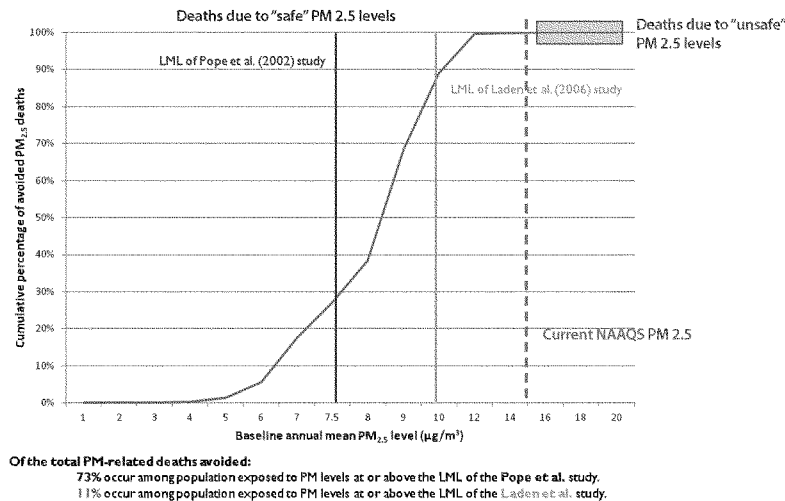
The statistical associations between premature mortality and PM 2.5 identified in the epidemiological studies cease below the lowest measured level in the study. But the EPA now imputes, by extrapolation, the same risks (and at the same rate) for PM 2.5 levels for which no statistical evidence exists. "Extrapolation is the use of quantitative relationships outside the range of evidence on which it was based."²⁵

The EPA's adoption of this no-threshold approach to assessing risk increased by almost four-fold. The EPA's estimate of total U.S. deaths attributable to PM 2.5 pollution—from 88,000 to 320,000! This approach means, according to the EPA at least, that over two-thirds of the public's health risk from exposure to PM 2.5 comes from ambient levels not only far below the protective national standards known as the NAAQS but even below the lowest modeled levels in the relevant studies.²⁶

In short, the EPA's incredible finding is that mortal risks increase in proportion to the extent that a location's ambient concentration of PM 2.5 exceeds natural background levels—now estimated by the EPA at the extremely low figure of 1 ug/m³. "This created a major change in the level of national mortality estimated to be due to PM 2.5 because the majority of the U.S. population resides in locations where the ambient PM 2.5 concentrations are below 10ug/m³."²⁷ (See Figure 2).

Despite critical questions from members of Congress, senior EPA leadership recently defended adoption of the no-threshold approach. Says Gina McCarthy, assistant administrator of the EPA: "Studies demonstrate an association between premature mortality and fine particle pollution at the lowest levels measured in the relevant studies, levels that are significantly below the NAAQS for fine particles. These studies have not observed a level below which premature

Figure 2: Risk Attributed to Ambient PM 2.5



Source: Table 5-15, EPA's RIA in final Utility MACT (mercury) Rule.

mortality effects do not occur. The best scientific evidence ... is that there is no threshold level of fine particle pollution below which health risk reductions are not achieved by reduced exposure." This is another way of saying: No risk is too low, improbable, or uncertain that it is not worth regulating.²⁸

The EPA claims that the two studies in question show no evidence of a threshold, but many studies ignored by the EPA do show a threshold. The agency's Benefit Study admits that the "no-threshold" assumption is a "key uncertainty" but as usual assigns a "high" confidence to the model that incorporates this assumption. The single study that the EPA cites to support this questionable "no-threshold" assumption is one funded by its own Health Effects Institute. And importantly, the "no-threshold" assumption violates the foundational principle of toxicology. It is the dose that makes the poison. The EPA's defense of this absurdly

precautionary assumption is another way of saying that the point at which all risk is zero cannot be proven. This is not surprising. How can any negative proposition be proven with complete certainty?

The EPA also maintains that its adoption of a "no-threshold" assumption in 2009 was endorsed by the agency's various scientific advisory panels. The growing evidence of financial conflicts of interest among the members of the EPA's technical review panels casts doubts on the objectivity of these review panels. Six of the seven members of the EPA's Clean Air Science Advisory Committee (CASAC) have received EPA grants to conduct research for the agency.²⁹ CASAC Chairman Jonathan Samet was the principal researcher for grants of \$9.5 million dollars. The EPA's inspector general has begun an investigation of these alleged conflicts of interest.³⁰

Lives saved, deaths prevented or avoided, and premature mortality: the EPA's terms are misleadingly imprecise. "Avoided deaths" do not occur since clean air does not confer immortality.

Nor, despite extremely low concentrations of PM 2.5 in most areas of the country, did the EPA give any public notice of the regulatory implications of this sea-change in risk assessment of current air quality conditions. Public health scientists may have long debated the relative merits of no-threshold linear regression analysis, but these were scientific debates without the economic and societal implications at stake in the EPA's regulatory agenda, unprecedented in its cumulative impacts.

A growing number of policy makers, state agencies, scientists, physicians and concerned voters are baffled by the EPA's inflated claims about low levels of PM 2.5. Public disclosure of the data behind the EPA's claim has not been forthcoming even after repeated congressional requests. U.S. Rep. Andy Harris (R-MD), a medical doctor who chairs the Energy and Environment subcommittee of the House Science, Space and Technology Committee, typifies growing frustration with the lack of transparency in the EPA's science. "If our current air," he has said, "is such a threat to human health that it is killing hundreds of thousands of people each year, I am very interested to review the information the agency relies on in establishing this relationship ... Because the EPA is not transparent with the sources of their data ... EPA seems to rely on making statistical hay out of minor associations between pollutants and premature mortality."³¹

Assumption III: Statistical Constructs = "Lives Saved"

The EPA's public pronouncements trumpet the dire need for additional regulation to save thousands of lives. Such unequivocal, emotional pronouncements grossly mislead the public and can intimidate even the hardened skeptic. A headline on the summary for the EPA's "Benefits" study is typical: "In 2020, the CAA Amendments will prevent over

230,000 early deaths"³² Administrator Jackson regularly tells the media the Clean Air Act has saved "literally hundreds of thousands of lives;"³³ or "public health protections will mean the difference between ... life and death for hundreds of thousands of citizens."³⁴

These "saved lives" are nothing more than statistical constructs; they do not refer to real people. When not speaking for public consumption, the EPA calls them "statistical lives." For the thousands of lives that the EPA claims air pollution has ended or that CAA regulation will save, there is not one identified individual. Nor are there specific medical conditions or causes of death attributed to PM 2.5 exposures. The EPA's typical approach is to assume any non-accidental death from cardiopulmonary conditions is caused by air quality.

Lives saved, deaths prevented or avoided, and premature mortality: the EPA's terms are misleadingly imprecise. "Avoided deaths" do not occur since clean air does not confer immortality. The health benefits the EPA projects from regulatory reduction of PM 2.5 is more accurately described as reduction in the relative risk of mortality. Extended life-expectancy or life-years gained more accurately describe the health benefit at issue.

The EPA constructs a "statistical life" (SL) by measuring the reduction in statistical risks assumed to result from reduction of ambient PM 2.5. "A 'statistical life' has traditionally referred to the aggregation of small risk reductions to many individuals until that aggregate reflects a total of one statistical life."³⁵ Quite obviously, "statistical lives saved" bear no relationship to actual individual human lives. The nearly \$2 trillion monetary value of "preventing 230,000 deaths" in the Benefits Study derives from a simple calculation. The EPA monetizes the value of one statistical life at \$8.9 million.

Thus: 230,000 "prevented deaths" x \$8.9 million per statistical life saved = \$1.8 trillion.

The EPA's valuation of one statistical life at \$8.9 million is dubious. The EPA's favored studies find that the median age of people who gain additional life expectancy is 80 years. And the increased life expectancy is estimated in several months, not years. But when aggregated into one statistical life, the EPA sets a value of \$8.9 million per statistical

Figure 3: Health Benefits from PM 2.5 Reduction with Alternative Assumptions

<p>QALY = Value of a Statistical Life</p> <p>QALY = Value of a Statistical Life Year</p>
<ul style="list-style-type: none"> One-sixth reduction of the EPA's \$8.9 million (per QALY) for median age of 80-year old 50% probability (instead of 10%) that assumption of true association: PM2.5 and premature death 50% probability (instead of 10%) that association is causal 50% probability (instead of 10%) of no PM2.5 threshold ambient health effects cease 50% probability of reduction of health effects due to disease prevention & medication
<p>Benefits Study: 230,000 QALY X \$8.9 million (per QALY) = \$1.8 billion benefits. Costs = \$65 billion</p> <p>With alternative assumptions above: Health Benefits = \$19 billion. Costs = \$65 billion</p> <p>\$1.8 billion of 1.8 billion = 100%. \$19 billion of 1.8 billion = 11%.</p>

Source: Cox #18 Green, LC, Armstrong, SR "Particulate Matter in Ambient Air and Mortality: Toxicologic Perspectives," *Regulatory Toxicology and Pharmacology* (2003) 38(3): 9-12.

life-year gained. That figure is more commonly used as a monetized value for a healthy 25-year old adult.³⁶ The monetized value of additional life expectancy for an 80-year old is typically estimated at about one-sixth the value of an individual 25 years old. Thus, if a more regularly used value for the octogenarian is used, the benefits decline by six-fold.

Thus: 230,000 "prevented deaths" x 1/6 of \$8.9 million = \$300 billion (instead of \$2 trillion).

And if the factual accuracy of the EPA's three key assumptions is assigned a probability of 50 percent rather than 100 percent, the costs of regulatory reduction of PM 2.5 dwarfs the projected health benefits with a ratio of \$65 billion (costs) to \$19 billion (benefits). With the more plausible assumption of 50 percent probability, the estimated health benefits fall from almost \$2 trillion to \$19 billion. (See Figure 3). The EPA's dramatic claims are highly sensitive to the unjustified certainty ascribed to the assumptions. "The EPA's evaluation of health benefits is unrealistically high, by a factor that could well exceed 1,000 and that it is therefore very likely that the costs of the 1990 CAA exceed its benefits, plausibly by more than 50-fold."³⁷

Assumption IV: Co-Benefits of PM 2.5 Reduction Can Justify Any Rule Under the CAA.

The EPA is now supporting new air quality regulations imposing multi-billion dollar costs on the basis of alleged mortality risks from trace levels of PM 2.5 created by the "no-threshold" approach. The EPA increasingly uses these "coincidental reductions" of PM 2.5 to justify the benefits of regulations intended to control not PM 2.5 but different pollutants such as mercury, ozone, and sulfur dioxide. The EPA's cost-benefit analysis calls these coincidentally occurring reductions "co-benefits."

This practice of relying on "co-benefits" from PM 2.5, evidently started in 1997 when the EPA issued the first NAAQS for PM 2.5. Since 2009, however, the EPA has increasingly used PM 2.5 co-benefits as the primary, if not exclusive, source of health benefits in rulemakings under the Clean Air Act directed to other pollutants. As examples, the EPA's mercury rule, industrial boiler rules, and the new SO₂ NAAQS rely on co-benefits from PM 2.5 reduction for over 99 percent of estimated health benefits. Without these co-benefits, the EPA's regulatory analysis of direct costs of these rules would far exceed any measurable benefits.

The EPA's "no-threshold" assumption in 2009 vastly increased the benefits that the EPA could ascribe to coincidental reduction of PM 2.5 in regulations not targeting this pollutant.

The EPA admits that the direct health benefits from reduction of mercury account for only 0.004 percent (or \$6 million) of the health benefits. And the PM 2.5 co-benefits account for 99.996 percent of what the EPA values as \$140 billion in health benefits. The EPA estimates the direct costs of the rule at \$11 billion. The agency's press releases and congressional testimony do not acknowledge this huge gap between direct mercury benefits and indirect PM 2.5 benefits, but the Federal Register notice for this rule explicitly reveals the glaring gap.³⁸

Dr. Anne Smith of National Economic Research Associates (NERA) has completed a thoroughly researched analysis of the EPA's use of co-benefits in "An Evaluation of the PM 2.5 Health Benefits Estimates in Regulatory Impact Analyses for Recent Air," a work from which this present paper draws heavily.³⁹ Dr. Smith analyzed the Regulatory Impact Analyses (RIA) for over 50 CAA-related rules promulgated since 1997. (See *Sidebar: Cost Benefit Analysis*).

As shown in *Figure 4 (next page)*, Dr. Smith found a growing reliance on co-benefits from PM 2.5 reductions. In 13 RIAs for rules not targeting PM 2.5, submitted between 2009-2011, co-benefits from PM 2.5 accounted for more than half of all estimated health benefits. In six of the cost-benefit analyses, co-benefits from PM 2.5 accounted for 100 percent of the benefits.

The EPA's "no-threshold" assumption in 2009 vastly increased the benefits that the EPA could ascribe to coincidental reduction of PM 2.5 in regulations not targeting this pollutant. As depicted in *Figure 2*, 94 percent of the 11,000 (statistical) lives purportedly "saved" by the mercury rule derive from PM 2.5 co-benefits in geographical areas that already attain the current PM 2.5 NAAQS of 15 ug/m3. Recall that NAAQS are conservative federal standards below

which human health should be fully protected. The EPA's increasing reliance on co-benefits garnered from PM concentrations approaching background levels is an evasion of the EPA's fundamental responsibility under the CAA to *directly* regulate the criteria pollutants, of which PM 2.5 is one.

By relying on co-benefits from PM 2.5, the EPA also evades its obligation to justify the need for stricter regulations. Without the 99.9 percent plus co-benefits from PM 2.5, the EPA's case for the health benefits supposedly obtained under the recently issued National Emission Standards for Hazardous Air Pollutants (NESHAP) would evaporate. Consider also the mercury rule, acknowledged by the EPA to be the most expensive CAA regulation to date, and widely viewed as a threat to electric reliability. The rule is based on PM 2.5 co-benefits in areas now attaining the NAAQS. It becomes on these grounds a disservice to the public, to policy makers and not least to the many employees whose job may end as a result of this regulation.

If the EPA is convinced that ambient PM 2.5 now presents dire health risks, the agency should make its case for strengthening the PM 2.5 NAAQS. The EPA is now reviewing the current 15 ug/m3 NAAQS PM 2.5 and apparently may reduce that standard to a level within a range of 10 to 13 ug/m3 or lower. Co-benefits from another pollutant should not be used in a cost-benefit analysis to justify regulation of another pollutant.

"Clearly, EPA's PM 2.5 co-benefits habit is allowing EPA to avoid grappling with the important task of making a case that all of these other pollutants really require tighter controls. ... but a high degree of complacency and analytical laziness has instead taken root ... The situation is completely at odds with the purpose of RIAs, which is to provide a consistent, credible and thoughtful evaluation of the societal value gained with increased regulatory burden that new rulemakings create."⁴⁰

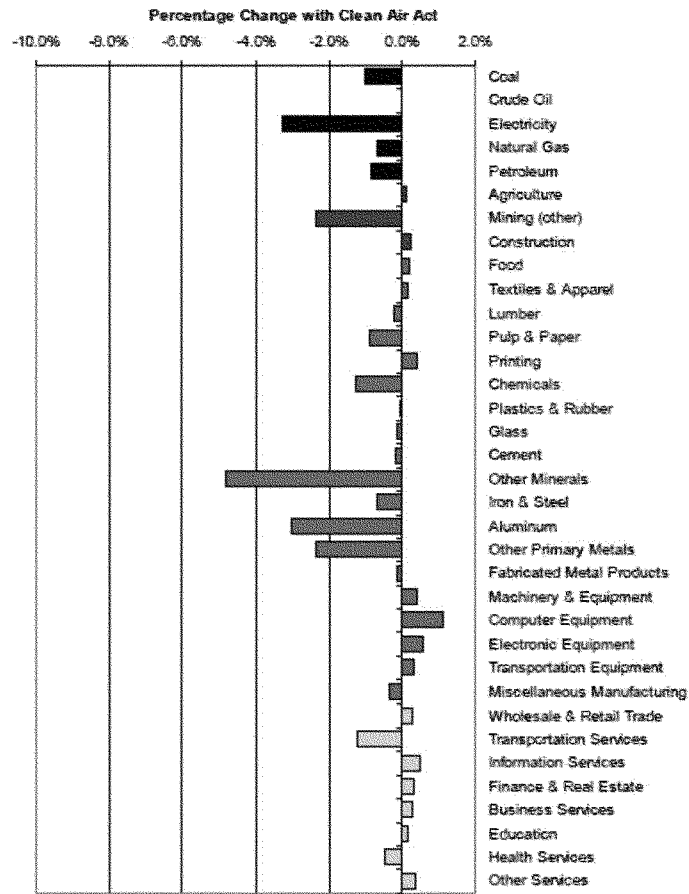
"In all, EPA's use of co-benefits should end for several reasons. It scares the public into believing that large numbers of people [would] die prematurely were it not for implementation of new rules on pollutants for which EPA has not actually identified any current public health risk."⁴¹

**Figure 4: Degree of Reliance on
PM 2.5-Related Co-Benefits in RIAs**

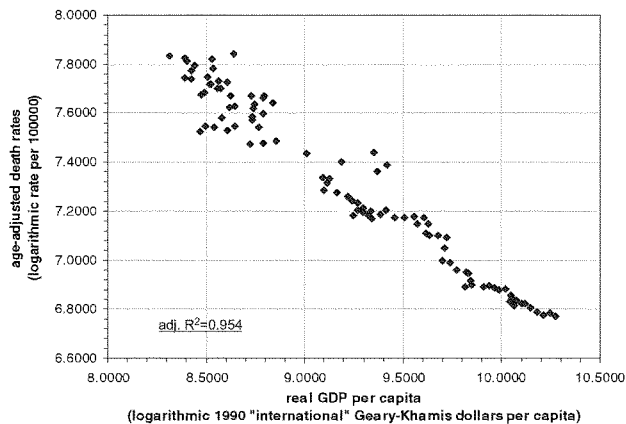
Year	RIAs for Rules Not Targeting Ambient PM 2.5	PM Co-Benefits Are >50% of Total	PM Co-Benefits Are Only Benefits Quantified
1997	Ozone NAAQS (12 1hr=>.08 8hr)	X	
1997	Pulp & Paper NESHAP		
1998	NOx SIP Call & Section 126 Petitions		
1999	Regional Haze Rule	X	
1999	Final Section 126 Petition Rule	X	
2004	Stationary Reciprocating Internal Combustion Engine NESHAP	X	
2004	Industrial Boilers & Process Heaters NESHAP	X	X
2005	Clean Air Mercury Rule	X	
2005	Clean Air Visibility Rule/BART Guidelines	X	
2006	Stationary Compression Ignition Internal Combustion Engine NSPS		
2007	Control of HAP from Mobile Sources	X	X
2008	Ozone NAAQS (.08 8hr=>.075 8hr)	X	
2008	Lead (Pb) NAAQS	X	
2009	New Marine Compression Ignition Engines > 301 per Cylinder	X	
2010	Reciprocating Internal Combustion Engines NESHAP -- Compression Ignition	X	X
2010	EPA/NHTSA Joint Light-Duty GHG & CAFE		
2010	SO2 NAAQS (1-hr, 75 ppb)	X	> 99.9%
2010	Existing Stationary Compression Ignition Engines NESHAP	X	X
2011	Industrial, Commercial, and Institutional Boilers NESHAP	X	X
2011	Industrial, Commercial, and Institutional Boilers & Process Heaters NESHAP	X	X
2011	Commercial & Industrial Solid Waste Incin. Units NSPS & Emission Guidelines	X	X
2011	Control of GHG from Medium & Heavy-Duty Vehicles		
2011	Ozone Reconsideration NAAQS	X	
2011	Utility Boiler MACT NESHAP (Final Rule's RIA)	X	≥ 99%
2011	Mercury Cell Chlor Alkali Plant Mercury Emissions NESHAP	X	
2011	Sewage Sludge Incineration Units NSPS & Emission Guidelines	X	X

Source: A. Smith, *Co-Benefits*, p.18.

Figure 5: Business Impacts



Note: Percentage change in productivity under the CAA for the year 2020. EPA estimate by EMPAX-CGE model.
Source: EPA Benefits Study, p. 8-20

Figure 6: Health Effects of Poverty and Unemployment

Source: Brenner MH Int, J. Epidemiol. (2005) 34: 1214-1221.

Conclusion

Many reputable scientific bodies have severely criticized the weakness of the science the EPA now relies upon to justify new rules. Among these critics: the National Academy of Science and the National Research Service, along with the EPA's own Scientific Advisory Board, Board of Scientific Counselors, and Clean Air Act Advisory Council. Dr. Thomas Burke, chairman of a recent National Academy of Science (NAS) review panel on the EPA's chemical risk assessment, told EPA officials that "EPA science is on the rocks ... if you fail, you become irrelevant, and that is kind of a crisis."⁴² The EPA's chemical risk assessment for formaldehyde set the level for adverse health effects—and thus regulations—several times lower than the average natural level of formaldehyde in human exhalation.⁴³

Current EPA science has a pattern. The agency relies on one or two cherry-picked studies which indicate the most adverse health effects at the lowest concentration of the pollutant in question. The EPA either ignores or gives lip service to sometimes hundreds of equally reputable studies

that contradict these studies. The EPA's favored studies are usually ecological epidemiological studies that show intricately manipulated statistical associations rather than data-driven causal connections between pollutant levels and adverse health effects. And instead of characterizing the relative uncertainties in the scientific studies on which the EPA relies, and weighing the evidence from diverse studies, the EPA publicly declares complete certainty and approval by peer review. Upon a closer look, the peer-reviewers regularly are either EPA employees, scientists who wrote the relevant studies or were employed by the same institution which the EPA paid to conduct the study.⁴⁴

The EPA would have the public believe that "pure science" shows that a fossil-fuel supplanting agenda is necessary to save the lives of hundreds of thousands. Note in *Figure 5*, the EPA's Benefits Study projects the decline of fossil fuel based industry as well as the energy intensive manufacturing and chemical industries dependent on affordable, efficient fossil fuels.

Sound science and objective scientists abound. Science in the hands of government, however, is easily compromised in order to reach predetermined policy outcomes.

Environmental regulatory standards reflect a judgment about what is acceptable or unacceptable societal risk. As such, the EPA's final regulatory decisions are ultimately policy decisions that no scientific findings can dictate. The EPA's manipulation of cost-benefit analyses to project massive benefits at comparatively modest cost denies policymakers and the public the information needed to weigh the many trade-offs involved in complex societal decisions about unacceptable risks. Economic impact does matter, and it matters to health. Many studies show that income and employment strongly correlate with health and life span. (See Figure 6)

Sound science and objective scientists abound. Science in the hands of government, however, is easily compromised in order to reach predetermined policy outcomes. If the current EPA's policy objective is to supplant fossil fuels, PM 2.5 is a useful tool. PM 2.5 is an ever-present byproduct of combustion of coal, natural gas, and oil. Emissions from cars and trucks, however, have been reduced by over 90 percent, at the same time vehicle miles traveled increased by 165 percent.⁴⁵ Natural processes will always release fine particles into the ambient atmosphere of this planet.

The EPA's science is, indeed, on the rocks, as the chairman of the NAS review concluded. The Clean Air Act under which the EPA conducts risk assessment and sets national standards needs to stipulate minimal criteria for scientific risk assessment of health effects, sufficiently robust to guide decisions on air quality standards. Such minimal criteria would include the following:

- The EPA's risk assessments must be peer-reviewed by an independent body—not, as now, within the agency itself.
- Toxicological studies and clinical trials demonstrating causal connections between ambient levels of a pollutant and adverse health effects trump epidemiological studies indicating statistical correlations. Ecological epidemiological studies, alone, are not rigorous enough to set national ambient or emission standards.
- Abandonment of no threshold linear regression modeling assumptions in setting ambient standard or regulatory emission limits.
- Health-based air quality standards that incorporate representative estimates of actual exposure and not the implausible assumption of 24-hour exposure to the highest monitored level.
- Physical measurement through monitored readings trump models.
- A plausible biological mechanism as predicate for health-effects findings.
- Comprehensive, cumulative cost-benefit analysis of all rules according to methodology and scope stipulated in law.

The EPA's regulatory sway is at a tipping point. Existing technologies cannot meet the EPA's new emission limits unless this country overnight can replace 85 percent of the energy on which our current way of life relies. Short of a miraculous breakthrough in technology, the EPA's regulatory agenda is a perilous pipe-dream precluded by the laws of math and physics. ★

Endnotes

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- ³² "Summary Report," *supra* note 9.
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About the Author

Kathleen Hartnett White joined the Texas Public Policy Foundation in January 2008. She is a Distinguished Senior Fellow-in-Residence and Director of the Armstrong Center for Energy & the Environment.

Prior to joining the Foundation, White served a six-year term as Chairman and Commissioner of the Texas Commission on Environmental Quality (TCEQ). With regulatory jurisdiction over air quality, water quality, water rights & utilities, storage and disposal of waste, TCEQ's staff of 3,000, annual budget of more than \$600 million, and 16 regional offices make it the second largest environmental regulatory agency in the world after the U.S. Environmental Protection Agency.

Prior to Governor Rick Perry's appointment of White to the TCEQ in 2001, she served as then Governor George Bush appointee to the Texas Water Development Board where she sat until appointed to TCEQ. She also served on the Texas Economic Development Commission and the Environmental Flows Study Commission. She is now serving in her fifth gubernatorial appointment as an officer and director of the Lower Colorado River Authority.

White is also co-owner of White Herefords and a partner with her husband in a 125 year-old ranching operation in Jeff Davis and Presidio counties. She also is Vice-Chairman of the Texas Water Foundation and sits on the board of the Texas Natural Resource Foundation. She recently received the 2007 Texas Water Conservation Association's President's award, the Colorado River Foundation's Friend of the River Award and the Texas Chemical Council's Leadership Award.

A writer and consultant on environmental laws, free market natural resource policy, private property rights, and ranching history, White received her bachelor *cum laude* and master degrees from Stanford University where for three years she held the Elizabeth Wheeler Lyman Scholarship for an Outstanding Woman in the Humanities. She was also awarded a Danforth National Fellowship for doctoral work at Princeton University in Comparative Religion and there won the Jonathan Edwards Award for Academic Excellence. She also studied law under a Lineberry Foundation Fellowship at Tech University.

Texas Public Policy Foundation

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The public is demanding a different direction for their government, and the Texas Public Policy Foundation is providing the ideas that enable policymakers to chart that new course.

MEMO, RE: QUESTIONABLE CLAIMS IN TESTIMONY FROM
FEBRUARY 14, 2013 ENVIRONMENT SUBCOMMITTEE HEARING,
SUBMITTED BY REPRESENTATIVE SUZANNE BONAMICI

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COMMITTEE ON EDUCATION
AND THE WORKFORCE
SUBCOMMITTEE:
HIGHER EDUCATION AND WORKFORCE TRAINING
WORKFORCE PROTECTION

COMMITTEE ON
SCIENCE, SPACE, AND TECHNOLOGY
SUBCOMMITTEE:
ENVIRONMENT, JUNEAU, ALASKA
SPACE

March 7, 2013

The Honorable Chris Stewart, Chairman
Environment Subcommittee
House Committee on Science, Space, and Technology
2321 Rayburn House Office Building
Washington, DC 20515

Dear Chairman Stewart:

As I indicated at the conclusion of the Environment Subcommittee hearing on February 14th, I was concerned about the accuracy of certain claims made in the witness testimony. Because we serve on a committee with jurisdiction over all matters relating to environmental research, Environmental Protection Agency research and development, and scientific issues related to environmental policy, among other things, it is critical that any factual errors made in witness testimony be addressed and corrected. Therefore, I have instructed the Committee staff to review the testimony and report to me where such errors should be highlighted. I ask that the attached memo be included in the record of the hearing.

Sincerely,



Representative Suzanne Bonamici
Ranking Member
Environment Subcommittee
House Committee on Science, Space, and Technology

MEMO

To: Ranking Member Suzanne Bonamici
From: House Science, Space and Technology Committee Democratic Staff
Re: Questionable Claims in Testimony from February 14th, 2013 Environment Subcommittee Hearing
Date: March 7, 2013

Responding to concerns regarding the factual accuracy of certain statements made by witnesses in the February 14, 2013, Environment Subcommittee hearing, we consulted with outside scientific and legal experts in reviewing testimony and compiling this memo. Several instances of questionable claims were found, but the following comprises a list of notable factual errors made by Mr. Trzupcek and Ms. Hartnett White. Please contact Andrea Jones or Chris King with any questions. We can be reached at (202) 225-6375.

Testimony of Mr. Richard Trzupcek

First, Mr. Trzupcek uses EPA's toxic air pollution standards for industrial boilers and incinerators as an example of the U.S. EPA inaccurately representing the costs and benefits of its regulations.¹ Mr. Trzupcek highlights only the 18,000 tons per year of PM_{2.5} emissions directly reduced by recent industrial boiler air toxics standards, and then goes on to claim that in his view this is an insignificant reduction because it is a small percentage (.3%) of overall national emissions of fine particulate matter.

Of critical importance is what Mr. Trzupcek fails to mention: that the standards also will reduce harmful sulfur dioxide (SO₂) emissions by 580,000 tons per year² – which is equivalent to roughly 17% of the SO₂ emissions from the electric power sector, far and away the biggest source of SO₂ in the country (with SO₂ emissions of 3,285,164 tons per year in 2012³). Moreover, EPA notes that these 580,000 tons of SO₂ emissions avoided each year are a *precursor* to PM_{2.5} emissions that will be reduced *separate and apart* from the 18,000 tons per year of *direct* PM_{2.5} emissions that the standards will reduce.⁴ Mr. Trzupcek is misrepresenting the level of *indirect* PM_{2.5} emissions reductions that these standards are achieving by ignoring the standards' projected reduction of 580,000 tons per year of SO₂.

¹ *The State of the Environment: Evaluating Progress and Priorities: Hearing Before the Subcomm. on Environment of the H. Comm. On Science, Space, and Technology*, 113th Cong. (2013) (statement of Richard Trzupcek) at 4.

² See, e.g., U.S. EPA, Fact Sheet: Adjustments for Major and Area Source Boilers and Certain Incinerators Summary Overview, at 2 available at:

http://www.epa.gov/airquality/combustion/docs/20121221_sum_overview_boiler_cisw_ls.pdf (last visited Feb. 25, 2013) ("Boilers Fact Sheet").

³ Data taken from EPA's Clean Air Markets Program data, available here: <http://ampd.epa.gov/ampd/>.

⁴ See, e.g., EPA's Regulatory Impact Analysis for these rules:

<http://www.epa.gov/airquality/combustion/docs/boilerreconfinalrule121220.pdf> (p. 7-2) ("Because SO₂ is also a precursor to PM_{2.5}, reducing SO₂ emissions will also reduce PM_{2.5} formation, human exposure, and therefore reduce estimated incidence of PM_{2.5}-related health effects."

Mr. Trzupek also fails to mention these standards are overdue, implemented 13 years after the statutory deadline established by Congress in the 1990 Clean Air Act Amendments (under which all air toxics standards were to be issued no later than 2000⁵). As such, Americans have been exposed to *millions* more tons of SO₂ emissions than Congress intended when it required standards for the largest sources of industrial hazardous air pollution. Contrary to Mr. Trzupek's assertions, the benefits from these standards are *far* from insignificant, and represent a major victory for public health in this country.⁶

Second, Mr. Trzupek characterizes the cost-benefit analysis numbers offered by EPA in its Regulatory Impact Analysis accompanying the toxic air pollution standards for industrial boilers as "peculiar logic." EPA's \$26.4 billion benefits figure represents avoided health hazards that Americans will no longer suffer every year (from premature deaths, heart attacks, strokes and asthma attacks). This figure also includes lower costs attributable to purely economic considerations (like missed work and school days).⁷ This substantial benefit figure – which outweighs compliance costs by a factor of at least 13 – does not correlate to the national debt and it is inappropriate to even draw this comparison.

Third, concerning Mr. Trzupek's points on pages four through six of his written testimony, the industrial boiler Maximum Achievable Control Technology standards are technology-based standards under § 112 of the Clean Air Act that require reductions to the degree achievable by modern technology.⁸ Congress, "concerned about the slow pace of EPA's regulation of HAPs, altered section 112," abandoning the earlier law's risk-based approach after it proved to be a profound failure, and extensively revised § 112 of the Clean Air Act to include "specific, strict pollution control requirements on both new and existing sources" of hazardous pollutants.⁹ Evaluating the benefits of a technology-based rule that requires huge reductions from individual pollution sources as a percentage of "reductions in overall national" emissions, as Mr. Trzupek presents his case, makes no sense for one simple reason: people do not breathe pollution "on average" or "nationally." They breathe air pollution where they live and work and attend school. Reducing dangerous pollution from polluting facilities in individual American communities is what the Clean Air Act was meant to achieve.

Fourth, and perhaps most egregiously, Mr. Trzupek asserts that "[w]e simply do not have an air toxics problem in the United States today."¹⁰ This is demonstrably false.

⁵ Clean Air Act § 112(e), 42 U.S.C. § 7412(e) (2013).

⁶ Along the same lines, Mr. Trzupek's chart at on page 7 similarly distorts the percentage contribution of the utility sector as a whole with respect to emissions of fine particulate matter. The utility sector is far and away the single largest pollution source of SO₂ emissions, themselves precursors to PM_{2.5} emissions, and with 3,285,164 tons per year of SO₂ emissions, this represents the largest source of manmade emissions of SO₂.

⁷ Boilers Fact Sheet, at 3.

⁸ 42 U.S.C. § 7412(d)(4).

⁹ See *New Jersey v. EPA*, 517 F.3d 574, 578 (D.C. Cir. 2008).

¹⁰ Trzupek, *supra* note 1, at 8.

The most recent National Air Toxics Assessment (whose pie charts Trzupek uses in his written testimony in Appendix B), found that “all 285 million people in the U.S. have an increased cancer risk of greater than 10 in one million” attributable to breathing toxic air pollution from outside sources.¹¹ The Assessment goes on to note that:

13.8 million people (less than 5 percent of the total U.S. population based on the 2000 census) have an increased cancer risk of greater than 100 in a million. The average, national, cancer risk for 2005 is 50 in a million. This means that, on average, approximately 1 in every 20,000 people have an increased likelihood of contracting cancer as a result of breathing air toxics from outdoor sources if they were exposed to 2005 emission levels over the course of their lifetime.¹²

The Clean Air Act Amendments of 1990, passed by overwhelming bipartisan majorities, established the Congressional goal to reduce cancer risks for all Americans to below 1 in 1 million.¹³ We are a long way from reaching that goal for all Americans. The cancer risks associated with air toxics are real, and yet the three largest industrial sources of many of these toxic pollutants—electric generating facilities, cement plants, and industrial boilers—remained uncontrolled at the federal level until as late as 2012. In light of these sobering realities, pretending we do not have an air toxics problem in this country is simply untrue.

Testimony of the Hon. Kathleen Hartnett White

Ms. Hartnett White makes a number of observations in her testimony that are incorrect.

With respect to lead, Ms. Hartnett White claims victory over lead pollution in citing to the elimination of lead from fuels in the 1970s. She further claims that “EPA could declare

¹¹ U.S. EPA, *Summary of Results for the 2005 National-Scale Assessment*, available at http://www.epa.gov/ttn/atw/nata2005/05pdfsum_results.pdf (last visited Feb. 25, 2013).

¹² *Id.* at 4-5.

¹³ See Clean Air Act §112(f)(2)(A), 42 U.S.C. §7412(f)(2)(A) (2013):

If Congress does not act on any recommendation submitted under paragraph (1), the Administrator shall, within 8 years after promulgation of standards for each category or subcategory of sources pursuant to subsection (c) of this section, promulgate standards for such category or subcategory if promulgation of such standards is required in order to provide an ample margin of safety to protect public health in accordance with this section (as in effect before November 15, 1990) or to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. Emission standards promulgated under this subsection shall provide an ample margin of safety to protect public health in accordance with this section (as in effect before November 15, 1990), unless the Administrator determines that a more stringent standard is necessary to prevent, taking into consideration costs, energy, safety, and other relevant factors, an adverse environmental effect. If standards promulgated pursuant to subsection (d) of this section and applicable to a category or subcategory of sources emitting a pollutant (or pollutants) classified as a known, probable or possible human carcinogen do not reduce lifetime excess cancer risks to the individual most exposed to emissions from a source in the category or subcategory to less than one in one million, the Administrator shall promulgate standards under this subsection for such source category.

victory on lead and maintain the current NAAQS but instead chose to lower the standard below naturally occurring background levels in most areas.”¹⁴

First, the wide-scale use of the catalytic converter is responsible for the removal of lead from gasoline. This technology was adopted in 1975 model-year cars due to the U.S. EPA’s adoption of strict standards for lead. As such, rather than supporting Ms. White’s claims, this example speaks to the overwhelming importance of environmental standards as drivers of improvements in the industrial sector. Moreover, it is a misrepresentation of both the law and the science to state that “EPA could declare victory on lead.” The National Ambient Air Quality Standards of the Clean Air Act require regular review of the state of the science on dangerous air pollution and require the agency to move forward in setting standards based on the best and most current science available.

Ms. Hartnett White then criticizes EPA’s Mercury and Air Toxics for power plants, and claims that “EPA admits that the cost of this regulation—at the EPA estimate of \$10 billion per year—is perhaps the most expensive air regulation to date, EPA also admits that the benefits from mercury reduction are so minute to be immeasurable,” (Hartnett White testimony, at pg. 8). These claims are factually untrue.

Ms. Hartnett White is repeating an industry talking point that distorts the cost-benefit analysis accompanying the standards. In making this claim, Ms. Hartnett White is ignoring the co-benefits of reducing fine particle pollution from power plants (so-called PM_{2.5}). Power plants emit toxic air pollution that can also be classified as PM_{2.5} pollution due to its size and chemical makeup. Due to this fact, pollution control devices that remove toxic air pollution from power plant emissions also remove PM_{2.5} pollution. In light of this, EPA properly includes PM_{2.5} co-benefits in its benefit calculations for the Mercury and Air Toxics standards. Ms. Hartnett White ignores these total benefits, which will reduce the PM_{2.5} pollution responsible for thousands of premature deaths, heart attacks and asthma attacks.

Finally, Ms. Hartnett White would have us believe that “Since 2009, EPA has been using the pure assumption (by data-free extrapolation) that there is no safe threshold of pollution—however low—below which health risk reductions are not achieved by [regulation-caused] reduced exposure.”¹⁵

In actual fact, Ms. Hartnett White is attempting to distort what is merely a principle of how pollution works on the human body. Ms. Hartnett White is referring to “no threshold”

¹⁴ *The State of the Environment: Evaluating Progress and Priorities: Hearing Before the Subcomm. on Environment of the H. Comm. On Science, Space, and Technology*, 113th Cong. (2013) (statement of Hon. Kathleen Hartnett White) at 7.

¹⁵ *The State of the Environment: Evaluating Progress and Priorities: Hearing Before the Subcomm. on Environment of the H. Comm. On Science, Space, and Technology*, 113th Cong. (2013) (statement of Hon. Kathleen Hartnett White) at 13.

pollution, which is an acknowledgement of how certain types of pollutants or chemicals work on the body, a recognition of the science behind certain pollution. Ms. Hartnett White quotes from sources relating to the National Ambient Air Quality Standards for PM_{2.5}. EPA does not claim that all pollutants are “no threshold pollutants,” but when, based on the science, a certain type of pollution has no threshold below which adverse effects do not occur, the agency acknowledges as much.

To conclude, both of these witness testimonies assert that we have been so successful at reducing air pollution that the U.S. EPA must now resort to cleaning up insignificant pollution in an attempt to stay relevant.¹⁶ Though it is unquestionably true that the United States has come a long way since the Clean Air Act was signed into law in 1970, we are far from done. As we have achieved many important milestones in reducing dangerous air pollution, so too have we continued to learn about the dangers of breathing polluted air.

Congress set a goal of safeguarding air quality to levels “requisite to protect public health” “with an allowable margin of safety.”¹⁷ The science shows us that we are not there yet. Well over 100 million Americans still live in areas experiencing unhealthy air quality. As of 2010 data, EPA research shows that “approximately 124 million people lived in counties that exceeded one or more national ambient air quality standard.”¹⁸ This pollution puts our most sensitive populations, our children, and the elderly at risk. And the risks can be deadly. Rather than patting ourselves on the back for a job well done, we must recognize that the job is only partially done.

¹⁶ *Id.* at 3-7; see also, e.g. Trzupak, *supra* note 1, at 1-3, 10-12.

¹⁷ Clean Air Act §109(b), 42 U.S.C. §7409(b).

¹⁸ U.S. EPA, Fact Sheet available at <http://www.epa.gov/airtrends/2011/report/highlights.pdf>.