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PROMOTING AMERICAN LEADERSHIP IN REDUCING AIR EMISSIONS THROUGH INNOVATION

HEARING

BEFORE THE

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS UNITED STATES SENATE

ONE HUNDRED FIFTEENTH CONGRESS

FIRST SESSION

NOVEMBER 15, 2017

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ONE HUNDRED FIFTEENTH CONGRESS
FIRST SESSION

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PROMOTING AMERICAN LEADERSHIP IN REDUCING AIR EMISSIONS THROUGH INNOVATION

WEDNESDAY, NOVEMBER 15, 2017

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC.

The Committee met, pursuant to notice, at 10:03 a.m. in room 406, Dirksen Senate Office Building, Hon. John Barrasso (Chairman of the Committee) presiding.

Present: Senators Barrasso, Carper, Inhofe, Capito, Boozman, Fischer, Ernst, Whitehouse, Markey, and Harris.

OPENING STATEMENT OF HON. JOHN BARRASSO, U.S. SENATOR FROM THE STATE OF WYOMING

Senator BARRASSO. Good morning. I call this hearing to order.

Today we are here to discuss America's continued leadership in reducing air emissions.

The United States has always been a leader in reducing air pollution by supporting and allowing the private sector to find innovative ways to reduce emissions. In fact, since 2005 the United States has reduced its combustion related carbon dioxide emissions more than any nation in the world. The development of innovative drilling methods has allowed domestic oil and gas producers to economically access natural gas, a low emitting fuel. Development of new technologies has consistently reduced our emissions, grown our energy, and improved how we use our resources.

Between 1970 and 2015 GDP grew by 246 percent, while emissions of particulate matter, ozone, lead, carbon monoxide, nitrogen dioxide, and sulfur dioxide dropped by an average of 70 percent.

New technologies have improved how we use energy to reduce emissions.

Today I am excited to hear about research at the University of Wyoming on similarly promising technologies that will allow us to both continue reducing our emissions and use our natural resources.

The University of Wyoming School of Energy Resources was established by our State legislature in 2006, and it serves as a bridge between academia and industry. The school conducts applied research to develop innovative solutions to solve critical energy and environmental challenges faced by our nation and the world. These technologies include carbon capture, utilization, and sequestration,

which has already received bipartisan support from my colleagues on this Committee.

In addition to carbon capture, utilization, and sequestration, the University of Wyoming is exploring research related to advanced coal combustion, rare earth elements from coal and coal by-products, carbon engineering, and measurements of methane and volatile organic compounds emissions from oil and gas operations.

Significant innovation is also occurring in the manufacturing sector. American manufacturers are the most productive in the world due to their dedication to always improving efficiency. At the same time, American manufacturers—in their entirety—have a strong track record of reducing their environmental impact.

According to the National Association of Manufacturers, who is represented here today, greenhouse gas emissions from the manufacturing sector has decreased by 10 percent over the past decade, while increasing their value to the economy by 19 percent.

During the last Administration, America moved away from an innovative approach and instead pursued a regulatory approach, which punished our businesses instead of supporting and collaborating with them. The last Administration's misguided policies included signing the U.S. up for the Paris Agreement, a deal that I thought was a bad deal; it would have stifled American growth.

I would like to introduce into the record the article published on the front page of yesterday's Washington Times entitled Emissions Report Casts Doubt on Paris Accord. The sub-headline is China Still Polluting as U.S. Cleans Air. China Still Polluting as U.S. Cleans Air.

Without objection, this will be admitted into the record.

[The referenced information follows:]

Paris deal failing? Global emissions up 2% despite U.S. drop; Chinese pollution skyrockets

China has kept its emissions in check in recent years but now shows a massive rise in pollution. Under the Paris pact, China agreed to cap its emissions by 2030, meaning it is still free to increase pollution. (Associated Press/File) more >

By Ben Wolfgang - *The Washington Times - Monday, November 13, 2017*

Two years after nearly every nation on earth signed the landmark Paris climate accord, researchers say the deal is failing to live up to its mission as China drives a spike in global carbon emissions, reversing years of steady decline.

The sobering news comes as world leaders gather in Germany for a high-level climate summit designed to marshal support for the Paris agreement and to encourage countries to make even more ambitious commitments to cut their own pollution.

Other nations have been critical of President Trump for announcing over the summer that the U.S. would pull out of the deal, but data released Monday show that American emissions are still dropping while those of China and other countries are back on the rise.

Several studies released by the Global Carbon Project say worldwide carbon emissions are projected to jump about 2 percent this year after staying flat for three years, according to preliminary estimates.

The culprit, the data show, is China, which has kept its emissions in check in recent years but now shows a massive rise in pollution. Under the Paris pact, China agreed to cap its emissions by 2030, meaning it is still free to increase pollution.

China's uptick this year, after a 1 percent drop in 2015 and flat emissions last year, is largely a result of the country's increased use of fossil fuels.

More broadly, researchers say, the data show the Paris agreement is not working as intended.

"Global commitments made in Paris in 2015 to reduce emissions are still not being matched by actions," said Glen Peters, a research director at Cicero's Center for International Climate Research.

"It is far too early to proclaim that we have turned a corner and started the journey toward zero emissions. While emissions may rise 2 percent in 2017, it is not possible to say whether this is a return to growth or a one-off increase," said Mr. Peters, who led one of the reports that was included in the sweeping Global Carbon Project study.

Chinese emissions are projected to rise by 3.5 percent this year, according to the study. China is the world's largest polluter and accounts for nearly 30 percent of all worldwide carbon emissions.

India's emissions also are expected to rise by 2 percent, though that is a much smaller increase than in recent years.

U.S. emissions, by contrast, are projected to decline by 0.4 percent this year. That is less of a decline than in recent years, research shows, but still underscores that technological advancements and a market shift away from coal in America are having tangible effects.

European emissions also are expected to decline slightly this year.

The news doesn't necessarily mean China is falling short of its promises because the nation has to do virtually nothing before 2030. But it's still a troubling sign that highlights long-standing complaints about the climate accord, mainly that it penalizes the U.S. in the short term and allows China to keep polluting.

The Paris deal required the U.S. to cut its emissions by at least 26 percent by 2025 when compared with 2005 levels. Mr. Trump shelved that commitment in June, saying the agreement was unfair to the U.S. and let other major polluters — specifically China and India — off the hook.

The data released Monday appear to back up his contention.

Meanwhile, the U.S. has become something of an international pariah at the Germany summit even though its emissions remain on a downward trajectory.

U.S. officials on Monday held an event focused on cleaner fossil fuels and nuclear power, and how those traditional power sources can help mitigate damage to the climate.

But the forum reportedly was interrupted by dozens of protesters who chanted, "You claim to be an American, but we see right through your greed."

David Banks, a special assistant to Mr. Trump on environmental issues, said the event could be considered controversial only "if we choose to bury our heads in the sand" about the need for clean fossil fuels, Reuters reported.

Nevertheless, environmentalists largely ignored the findings that U.S. emissions are headed down while China is fueling a worldwide increase. Instead, they hammered the administration for even bringing up the notion of continued fossil fuel use.

"Nothing could encapsulate the extreme tone-deafness and isolation of this administration more than an event to celebrate fossil fuels during this important global climate meeting," said John Coequyt, global climate policy director at the Sierra Club, one of the world's leading environmental groups.

As for emissions, researchers suggest the data show that the reality of controlling pollution is far different from the promises any country makes under the Paris accord. For example, China's economic growth this year has fueled the need for more energy, and the country is relying on fossil fuels to meet that need despite its promises under Paris.

Emissions increases could continue in the coming years without aggressive action, analysts said.

"The slowdown in emissions growth from 2014 to 2016 was always a delicate balance, and the likely 2 percent increase in 2017 clearly demonstrates that we can't take the recent slowdown for granted," said Robbie Andrew, a senior researcher at Cicero who also co-authored the studies.

Highlights of the report can be found here.

Senator BARRASSO. The article explains that U.S. greenhouse gas emissions are projected to decline this year. Meanwhile, greenhouse gas emissions in China and India—signatories to the Paris Agreement—are projected to increase.

Today we will also hear about how other policies are hindering the private sector's ability to innovate to the point where industry is abandoning investments in technologies to make environmental improvements. For example, New Source Review requirements under the Clean Air Act are discouraging businesses from retrofitting their existing facilities with equipment that would reduce emissions, as well as from making operational changes that would be more efficient.

President Trump has demonstrated a commitment to reducing these barriers to American businesses through his Executive Order promoting American energy independence and a Presidential moratorium on reducing the regulatory barriers that domestic manufacturers face.

Today, I look forward to examining how we can provide American businesses the space to do what they do best, solve problems through innovative solutions.

I now turn to Ranking Member Carper, my friend and colleague on this Committee.

OPENING STATEMENT OF HON. THOMAS R. CARPER, U.S. SENATOR FROM THE STATE OF DELAWARE

Senator CARPER. Thank you, Mr. Chairman.

To our witnesses, welcome. I told the Chairman this morning I was excited about today's hearing. This is one of those days and one of those issues around which I thought there would be a whole lot of consensus and agreement, and I am tempted to just go point by point to rebut half the things that he just said, but I don't want to rain on the parade. This is going to be a great hearing, and we are delighted that you are here, and thrilled with the idea of putting a spotlight on the idea that we can have cleaner air, cleaner environment, cleaner water, and at the same time create jobs and have economic growth. They are not incompatible. In fact, they are most interdependent. So we will leave it at that. But we are grateful that you are all here.

It was Abraham Lincoln who famously said that the role of government is to do for the people what they cannot do for themselves. The role of government is to do for the people what they cannot do for themselves. And I think one of the most important jobs that the government has is to help create a nurturing environment for job creation and job preservation. People like us—Presidents, Governors, mayors—we don't create jobs. What we help to do, with the help of a lot of other folks and a lot of key stakeholders, is we help create a nurturing environment for job creation, job preservation. We also have an obligation in the Government to protect our health, the health of our public, to ensure that all Americans can pursue life, liberty, and the pursuit of happiness. Luckily, the two are not mutually exclusive. In fact, history shows that cleaner air is also good for business.

Today, our country is undergoing a clean energy revolution, and that did not happen by accident. Over the past 8 years, starting

with the Recovery Act, the Federal Government has provided economic incentives, environmental targets in the supported market to develop investment in the clean energy of the future. This carrot and stick approach resulted in more than $507 billion of investment in the clean energy sector over the last decade and in our country's becoming a leader in exporting clean air and clean energy technologies. Thanks to these investments, consumers are paying less for energy, jobs are being created here at home to keep up with the demand for the products that these technologies enable. In 2016 alone, 1 out of every 50 new jobs added in the United States was created by the solar energy industry.

Today, we are going to hear from one of our witnesses about a particular manufacturing sector that has reaped the benefits of the past actions of our Federal Government, the automobile industry. I would like to remind my colleagues how this sector has changed over the past decade. It is a story near and dear to my own heart, and I think a perfect example of how American innovation and economic opportunities can be driven by Federal investments and regulations, common sense regulations.

Despite decades of Federal Government funding for advancements in automobile fuel efficiency technology, it wasn't until after Congress increased fuel economy standards in 2007 that consumers really started to see the benefits. The 2007 compromise crafted by our colleagues, including former Senators Ted Stevens, Dianne Feinstein, Ed Markey, who is in and out of here today, and myself increased the fuel efficiency standards for cars and trucks and vans for the first time in 32 years. The 2007 light-duty vehicle efficiency targets were replaced by tighter efficiency targets and greenhouse gas emission limits in 2010, and again in 2012, with the support of major automobile, labor, environmental, health groups, and consumer groups. The results have been remarkable. You don't have to believe me; the numbers prove it.

Taken together, these car and light-duty truck standards are projected to almost double the fuel economy of cars and light duty trucks to 54.5 miles per gallon by 2025. These standards are reducing the amount of oil we import by 2 million barrels per day and will save American drivers nearly $1.7 trillion in gasoline costs that they will no longer have to buy.

In even better news, these regulations have not been the job killer that many would have us believe. In fact, they have been quite the opposite. Automakers found that making more energy efficient vehicles allowed American companies to better compete not just here at home, but overseas as well. Early implementation of these standards occurred during 7 years of unprecedented growth in the auto industry and record sales last year, in 2016. The industry has also added roughly 700,000 direct auto sector jobs since 2009.

It is clear that we have made great gains in reducing emissions in our transportation and energy sectors over the past 8 years, while still growing our economy. We have been doing something right. And although our air is cleaner today and our economy is strong, we still need to do more to protect public health and ensure that America remains a leader in the global economy.

Having said that, I fear that this Administration is taking us in the wrong direction in this arena walking away from the Paris Ac-

cord agreement, leaving the U.S. as the only country in the entire world that is not part of this historic agreement. And walking away from other climate and air protections is, I think, beyond irresponsible. And saying that you have to do so for the good of the American economy is just blatantly false. In fact, scrapping forward looking standards will only provide more uncertainty for businesses and threaten to stifle American innovation.

For me it is clear. This is not an either/or situation. In order for the United States to continue to be the world's leader in this new clean energy revolution, and we need to be, we need both Federal investment in technology and common sense regulations.

So, thanks, Mr. Chairman, for holding this important hearing.

We are delighted that our witnesses are here. We look forward to a robust conversation with you all. Thank you.

[The prepared statement of Senator Carper follows:]

STATEMENT OF HON. THOMAS R. CARPER,
U.S. SENATOR FROM THE STATE OF DELAWARE

I would like to thank the Chairman for having this hearing today. I believe that improving the understanding and celebrating the role that technological innovation plays in helping the country meet our clean air and climate challenges are very important, and I hope we can have more hearings like this. I also thank our witnesses for being here today.

Abraham Lincoln famously said that the role of government is to do for the people what they cannot do for themselves.

One of those tasks, I believe, is for government to help create a nurturing environment for job creation and job preservation. Our government also has an obligation to help protect the health of the public to ensure that all Americans can pursue life, liberty, and happiness.

Luckily, the two are not mutually exclusive. In fact, history shows that cleaner air is good for business.

Today our country is undergoing a clean energy revolution. That didn't happen by accident. Over the past 8 years, starting with the Recovery Act, the Federal Government has provided economic incentives, environmental targets, and has supported market development to encourage investments in the clean energy of the future.

This carrot and stick approach resulted in more than $507 billion of investment in the clean energy sector over the last decade and in our country's becoming a leader in exporting clean air and clean energy technologies.

Thanks to our investments, consumers are paying less for energy, and jobs are being created here at home to keep up with the demand for the products that these technologies enable. In 2016 alone 1 out of every 50 new jobs added in the United States was created by the solar energy industry.

Today we will hear from one of our witnesses about a particular manufacturing sector that has reaped the benefits of the past actions of the Federal Government—the automobile industry. I'd like to remind my colleagues how this sector has changed over the past decade. It's a story near and dear to my heart and I think a perfect example of how American innovation and economic opportunities can be driven by Federal investments AND regulations.

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The 2007 light-duty vehicle efficiency targets were replaced by tighter efficiency targets and greenhouse gas emissions limits in 2010 and again in 2012, with the support of the major automakers, labor, environmental, and health groups, and consumer groups.

The results have been remarkable, but you don't have to believe me—the numbers prove it.

Taken together, these car and light-duty truck standards are projected to almost double the fuel economy of cars and light-duty trucks to 54.5 miles per gallon by

2025. These standards are reducing the amount of oil we import by 2 million barrels per day and will save American drivers nearly $1.7 trillion in gasoline they will no longer have to buy.

In even better news, these regulations have not been the job killers that many would have you believe. In fact, they have been quite the opposite.

Automakers found that making more fuel efficient vehicles allowed American companies to better compete here at home and abroad.

Early implementation of these standards occurred during 7 years of unprecedented growth in the auto industry and record sales in 2016. The industry has also added roughly 700,000 direct auto sector jobs since 2009.

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Having said that, I fear this Administration is taking us in the wrong direction in this arena.

Walking away from the Paris Climate Agreement—leaving the U.S. the only country in the entire world not part of this historic deal—and walking away from other climate and clean air protections are beyond irresponsible. And saying that you have to do so for the good of the American economy is blatantly false. In fact, scrapping forward looking standards will only provide more uncertainty for businesses and threaten to stifle American innovation.

For me, it is clear—this is not an either/or situation. In order for the United States to continue to be the world's leader in this new clean energy revolution, we need both Federal investments in technology AND common sense regulations.

Thank you again to the Chairman for holding this important hearing. I look forward to hearing from our witnesses their ideas on how we can do that.

Senator BARRASSO. Well, thank you, Senator Carper.

We will now hear from our witnesses, but before we turn to Kipp Coddington, let me first say a few words about him.

Mr. Coddington has a distinguished career as a chemical engineer and as an attorney. He has more than two decades of experience in helping fossil and renewable energy companies address some of their most challenging energy and environmental issues. At the University of Wyoming, Mr. Coddington oversees the Carbon Management Institute, which is striving to become a world class center of technoeconomic and carbon management solutions by conducting applied research.

In addition to his duties at the University of Wyoming, Mr. Coddington is the former chair of the International Organization for Standardizations Committee that is in the process of drafting the first international technical standard for storage of carbon dioxide during enhanced oil recovery operations.

Before moving to my home State of Wyoming, Mr. Coddington practiced law here in Washington, DC, and I am pleased that he now calls the great State of Wyoming home.

In addition to Mr. Coddington, we have Mr. Ross Eisenberg, who is Vice President of Energy and Resources Policy for the National Association of Manufacturers.

And also joining is today is Zoe Lipman, who is the Director of Vehicles and Advanced Transportation Program, the BlueGreen Alliance.

I want to remind the witnesses that your full written testimony will be made part of the official hearing record today, so please keep your statements to 5 minutes so that we may have time for questions. I look forward to your testimony.

I would recommend, also, and remind you that your full written testimony will be made part of the official hearing today, so please keep your statements to 5 minutes.

Mr. Coddington, please begin.

STATEMENT OF KIPP CODDINGTON, DIRECTOR, CARBON MANAGEMENT INSTITUTE, SCHOOL OF ENERGY RESOURCES, UNIVERSITY OF WYOMING

Mr. CODDINGTON. Mr. Chairman and Senators, thank you for the opportunity to appear before you today to discuss research at the University of Wyoming related to reducing air emissions through the development of new technologies and efficient practices in manufacturing and energy production and use. I am the Director of Energy Policy and Economics at the School of Energy Resources at UW and also direct the Carbon Management Institute, which is one of SER's Centers of Excellence.

All the projects and research areas noted in my testimony are important so that the United States remains a leader in using its abundant energy resources with reduced impacts to air quality. These air issues also are important to Wyoming, which is one of the nation's leading energy jurisdictions. According to the U.S. Energy Information Administration data for 2015, first, Wyoming produced 42 percent of all coal mined in the United States; second, 32 States received coal from Wyoming mines, with 10 States, including Wyoming, obtaining more than 90 percent of their domestic coal from Wyoming; third, Wyoming accounted for 6.2 percent of U.S. marketed natural gas production; and fourth, almost 88 percent of net electricity generation in Wyoming came from coal, and nearly 11 percent came from renewable energy resources, primarily wind.

Sitting in the Rocky Mountain west, Wyoming energy resources face a variety of environmental challenges and opportunities, from the State of California's enduring air and climate regulatory programs to fuel choices by Wyoming customers of Wyoming energy.

My written testimony provides a broad overview of UW's research, divided into the following topical areas: first, reducing atmospheric emissions of greenhouse gases and other constituents associated with the combustion of fossil fuels; second, utilizing carbon dioxide once it is combusted from the utilization of fossil fuels; and third, not creating emissions in the first instance, which would include, for example, taking coal directly to beneficial products instead of combusting it for electricity.

My written remarks conclude with some brief observations about our policy work and ongoing engagements with regional stakeholders, such as Idaho National Lab.

With respect to topic area No. 1, reducing emissions from the combustion of fossil fuels, UW is working on numerous technologies, such as flameless pressurized oxyfuel combustion, coal firing coal with biomass, and measurements of methane and volatile organic compound emissions from oil and gas operations.

With respect to topic area two, utilizing carbon dioxide once it is produced from the combustion of fossil fuels, the State of Wyoming is an ideal jurisdiction to advance research and projects related to capturing and utilizing emissions of carbon dioxide. For example,

led by the Wyoming Infrastructure Authority and with the support of many private and public sector entities in Wyoming, the Gillette based Integrated Test Center will soon serve as an operational test site for CO_2 capture technology developers and providers to evaluate carbon capture utilization and storage technologies using actual fuel gas from a coal fired power plant. The ITC is also hosting the coal track of the $20 million NRG COSIA Carbon XPRIZE, a global competition to develop breakthrough technologies that convert CO_2 emissions from fossil fuel combustion into products with the highest net value.

It is also worth noting that Wyoming is one of only a handful of States with existing CO_2 pipeline infrastructure, with ongoing efforts to expand the same under the Wyoming Pipeline Corridor Initiative. Wyoming also has an existing CO_2 enhanced oil recovery industry and has enacted laws to encourage the environmentally responsible siting and operation of CCUS-related projects in the State.

My written testimony provides more details about the abundant work we are doing in the area of CO_2 utilization.

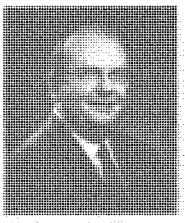
Third, the third research area I wanted to cover is advancing the utilization of coal in a non-combustion environment. UW is alone in developing and advancing novel and innovative technologies related to the extraction and production of valuable non-Btu products from coal. The primary focus of this research is to advance coal utilization as a feedstock to manufacture and generate valuable non-Btu coal related products such as carbon fiber and carbon rich chemicals, agricultural and building products. And some of these products, for example, graphite and carbon fiber, are predicted to be in short supply as the demand for lightweight materials, renewable energy, and the like grows in the years ahead.

Our work on rare Earth elements is also expanding. UW researchers, in collaboration with colleagues on campus and throughout the region, are separately investigating the identification, characterization, and separation of REEs from coal, coal by-products, and produced waters. Expansion of domestic sources of REEs remains a high priority for policymakers.

This concludes my verbal testimony. I commend the Committee for addressing the issue of the role that innovative technologies are playing in reducing air emissions. UW is doing its best to advance frontiers of these research areas for the benefit of a variety of stakeholders. The ongoing Federal role in supporting these research endeavors is imperative.

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

[The prepared statement of Mr. Coddington follows:]



Kipp Coddington
Director of Carbon Management Institute
University of Wyoming

Coddington is the Director of the Carbon Management Institute at the School of Energy Resources, University of Wyoming. A chemical engineer and lawyer, Coddington has more than two decades of experience in helping fossil and renewable energy companies address some of their most challenging energy, environmental, and climate change issues.

Coddington chairs the International Organization for Standardization's (ISO) committee that is drafting the first international technical standard for storage of carbon dioxide (CO_2) during enhanced hydrocarbon recovery operations. He has: (1) testified before the U.S. Senate Committee on Energy and Natural Resources; (2) advised the State of California; and (3) advised the Interstate Oil & Gas Compact Commission.

Coddington is listed in Chambers Global/Climate Change; Chambers USA/Nationwide-Climate Change; Chambers USA/District of Columbia-Environment; International Who's Who of Environmental Lawyers; and International Who's Who of Business Lawyers. He has a B.S. in Chemical Engineering from Purdue University (1986; With Highest Distinction; Outstanding Senior Engineer) and a Juris Doctor from Georgetown University (1993; Magna Cum Laude; Order of the Coif).

STATEMENT OF KIPP CODDINGTON, ESQ.

DIRECTOR, ENERGY POLICY & ECONOMICS

at the

SCHOOL OF ENERGY RESOURCES, UNIVERSITY OF WYOMING

before the

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

concerning

"PROMOTING AMERICAN LEADERSHIP IN REDUCING AIR EMISSIONS THROUGH INNOVATION"

NOVEMBER 15, 2017

Introduction

Mr. Chairman and Members of the Committee, thank you for the opportunity to appear before you today to discuss research at the University of Wyoming (UW) related to reducing air emissions through the development of new technologies and efficient practices in manufacturing and energy production and use. I am the Director of Energy Policy & Economics at the School of Energy Resources (SER) at UW, and also direct the Carbon Management Institute, which is one of SER's Centers of Excellence.

All of the projects and research areas noted in my testimony are important so that the United States remains a leader in using its abundant energy resources with reduced impacts to air quality. These air issues also are important for Wyoming, which is one of the Nation's leading energy jurisdictions. According to U.S. Energy Information Administration (EIA) data for 2015[1]:

- ✓ Wyoming produced 42% of all coal mined in the United States.
- ✓ Thirty-two (32) states received coal from Wyoming mines, with ten (10) states, including Wyoming, obtaining more than 90% of their domestic coal from Wyoming.
- ✓ Wyoming accounted for 6.2% of U.S. marketed natural gas production.
- ✓ Almost 88% of net electricity generation in Wyoming came from coal and nearly 11% came from renewable energy resources, primarily wind.

Sitting in the Rocky Mountain west, Wyoming energy resources face a variety of environmental challenges and opportunities, from the State of California's enduring air and climate regulatory programs to fuel choices by customers of Wyoming energy, whether in the State or elsewhere.

[1] Source: "Wyoming, State Profile and Energy Estimates" (EIA, updated December 15, 2016) (available at https://www.eia.gov/state/?sid=WY).

Testimony

My testimony provides a very broad overview of UW's research, divided into the following topical areas: (1) first, reducing atmospheric emissions of greenhouses (GHGs) and criteria constituents associated with the combustion and/or production of fossil fuels; (2) second, managing, capturing and utilizing carbon dioxide (CO_2) atmospheric emissions from the combustion of fossil fuels; and (3) third, understanding the decomposition behavior of coal and how coal molecules can be deliberately reconfigured to make valuable carbon-rich products which support other industries, including chemicals, building construction, agriculture and energy storage. I conclude with some brief remarks about our policy work and ongoing engagements with regional stakeholders in the western Rocky Mountain and Great Plains regions.

Topic Area #1: Reducing Anthropogenic Emissions

UW has several research programs underway related to the development of novel technologies to reduce atmospheric emissions of anthropogenic GHGs and criteria constituents, including the following:

- ✓ Flameless Pressurized Oxy-Fuel Combustion

This technology, which involves the combustion of coal at elevated pressure in a highly preheated stream of oxygen that is diluted with both CO_2 and water, has the goal of: (1) recovering energy from low-rank coal and other brown fuels; (2) enabling CO_2 recovery on an economically viable basis; and (3) minimizing emissions of nitrous oxides, particulates and heavy metals.

- ✓ Co-Firing Coal With Biomass

UW conducts extensive research on co-utilization of biomass with coal for reduced emissions in combustion, gasification and pyrolysis. Our research focuses on near-term substitution in existing power plants, as well as long-term advanced conversion technologies.

- ✓ Biomass for Sustainable Food, Energy and Water Resource Development

UW research focuses on novel bio-resource materials for sustainable food, energy and water resource development. Research tasks here include: (1) production of fuels and biochar from biomass materials; (2) enhancement of biochar quality through photochemical and ultrasonic chemistry and functionalization; and (3) application of functionalized and photochemical and ultrasonic chemistry-enhanced biochar for CO_2 capture, water treatment and food production.

- ✓ Measurements of Methane and Volatile Organic Compound (VOCs) Emissions from Oil & Gas Operations

Flux estimates of methane and VOCs made by the UW Center for Air Quality, while technically challenging, are essential for operators to understand what their true emissions are and how close they are to inventory estimates. Utilizing flux measurements to improve inventories is essential in developing functional photo-chemical models that can replicate the impacts of oil & gas operations on air quality, especially wintertime ozone. Having functional models is a critical way that operators can make good decisions about the most effective and economical ways to minimize air quality impacts from the expansion of energy production.

And we are pushing the science in terms of directly measuring VOC fluxes. UW is one of only a handful of institutions of higher education in the United States that flies its own aircraft for atmospheric research.

On a related front, the Casper-based Enhanced Oil Recovery Institute assists Wyoming operators with the engineering and sourcing of new technologies that facilitate economic reductions in methane emissions.

Topic Area #2: Capturing and Utilizing Atmospheric Emissions of CO_2

The State of Wyoming is an ideal jurisdiction to advance research and projects related to capturing and utilizing emissions of CO_2. For example, led by the Wyoming Infrastructure Authority and with the support of many private- and public-sector entities in Wyoming, the Gillette-based Integrated Test Center (ITC) will soon serve as an operational test site for CO_2 capture technology developers and providers to evaluate carbon capture utilization and storage (CCUS) technologies using actual coal-based fuel gas equivalent to a 20 MW generation load. The ITC is also hosting the coal-track of the $20M NRG COSIA Carbon XPRIZE, a global competition to develop breakthrough technologies that convert CO_2 emissions from fossil-fuel combustion into products with the highest net value, such as enhanced concrete, biofuels, nanotubes and fertilizers. Wyoming is one of a handful of states with existing CO_2 pipeline infrastructure, with ongoing efforts to expand the same under the Wyoming Pipeline Corridor Initiative. Wyoming also has an existing CO_2-enhanced oil recovery (CO_2-EOR) industry and has enacted laws to encourage the environmentally responsible siting and operation of CCUS-related projects in the State.

UW has several research programs underway in this field, too, including the following:

- ✓ U.S. Department of Energy's DOE's Carbon Storage Assurance and Facility Enterprise (CarbonSAFE) Program

Relying upon interdisciplinary public- and private-sector teams with expertise in commercial project development, non-EOR geologic storage (e.g., saline formations), CO_2-EOR, law and

project finance, we are advancing two project sites in Wyoming under Phase I of DOE's CarbonSAFE program, a federally supported endeavor to hopefully site one or more large-scale integrated CCUS facilities throughout the United States by the 2025 time frame. We are honored to be working with our utility partners in these endeavors, both of whom continue to do yeoman's work to advance CCUS: (1) PacifiCorp/Rocky Mountain Power; and (2) Basin Electric Power Cooperative. These efforts build upon UW's prior CCUS work under the Wyoming Carbon Underground Storage Project, a pioneering three-year research project that characterized two potential CO_2 storage reservoirs (the Weber Sandstone and Madison Limestone) on the Rock Springs Uplift in the southwestern corner of the State.

- ✓ U.S.-China Clean Energy Research Center (CERC)

In conjunction with colleagues at West Virginia University, University of Kentucky and elsewhere, UW is pleased to play an integral role in DOE's CERC program. CERC is a multi-year DOE effort to foster collaborative research and development of CCUS and clean coal technologies between the U.S. and China.

- ✓ CO_2 Capture Technologies

UW researchers continue to advance a variety of CO_2 capture technologies including the novel use of catalysts that augments conventional gasification and chemical looping solutions.

- ✓ CCUS-Based Biofuels

In collaboration with colleagues at Montana State University, the University of South Dakota and elsewhere, UW is part of the recently announced four-year National Science Foundation initiative to determine if changes in commodity production and capturing CO_2 are sustainable, or even feasible, in the Upper Missouri River Basin.

Topic Area #3: Advancing Applied Research Related to Non-Btu Markets for Coal and Coal By-Products

UW is alone in developing and advancing novel and innovative technologies related to the extraction and production of valuable non-Btu products from coal. The primary focus of this research is to advance coal utilization as a feedstock to manufacture and generate valuable non-Btu coal-related products, such as carbon fiber and carbon-rich chemicals, agricultural and building products. The manufacture of some of these coal-based products has the potential to be deployed as a pre-treatment before coal is combusted to offset the typically high costs associated with post-combustion carbon capture solutions. And some of these products – e.g., graphite and carbon fiber -- are predicted to be in short supply as the demand for lightweight materials, renewable energy and the like grows in the years ahead.

Our work on Rare Earth Elements (REE's) is also expanding. UW researchers – in collaboration with colleagues on campus and throughout the region – are separately investigating the identification, characterization and separation of REE's from coal, coal by-products and produced waters. Expansion of domestic sources of REE's remains a high priority for policymakers.

Some Closing Remarks about UW's Energy Policy Work and Regional Collaborations

UW's innovative work extends beyond the lab bench to the policy realm. Most recently, UW: (1) played a leading role in the 2016 report by the National Coal Council regarding geologic and non-geologic technologies that hold promise to utilize CO_2 as a feedstock for products; and (2) published an interdisciplinary analysis of the impact of the social cost of carbon in the development of energy projects on federal lands.

A brief note about regional collaborations: Over the years and continuing, UW researchers in these and related areas have benefited from a variety of regional relationships, from Idaho National Laboratory (INL), including the Center for Advanced Energy Studies, to the Energy & Environmental Research Center at the University of North Dakota.

Conclusion

This concludes my testimony. I commend the Committee for addressing the issue of the role that innovative technologies are playing in reducing air emissions. UW is doing its best to advance the frontiers of these research areas for the benefit of a variety of stakeholders. The ongoing federal role in supporting these research endeavors is imperative. Mr. Chairman and Members of the Committee. I would be pleased to answer any questions that you may have.

UNIVERSITY
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December 14, 2017

MEMORANDUM

TO: Chairman John Barrasso, M.D.
Senate Committee on Environment and Public Works

Ranking Member Thomas R. Carper
Senate Committee on Environment and Public Works

FROM: Kipp Coddington, Esq.
Director, Energy Policy & Economics
School of Energy Resources
University of Wyoming

RE: Responses to Questions for the Record for Kipp Coddington as Follow-Up to the November 15, 2017 Hearing Entitled "Promoting American Leadership in Reducing Air Emissions Through Innovation"

This memorandum addresses the referenced questions set forth in your letter dated November 30, 2017.

Questions from Senator Barrasso:

1. *In your testimony, you highlighted the University of Wyoming's numerous partnerships with the federal government, industry, and other entities. What could Congress do to facilitate greater collaboration and maximize the efficacy of research funding at the University of Wyoming and elsewhere?*

The greatest need in this arena is more funding for advancing technologies through U.S. Department of Energy (DOE) Technology Readiness Levels 5 through 9 (inclusive), especially demonstration at scale. Federal agencies do an admirable job of funding basic R&D, but many promising technologies fail to advance due to lack of funding for scale-up in the field – i.e., the processes that lead to commercialization. Further, the number of demonstrations of different technology options funded is far too low.

2. *Based on the University of Wyoming's participation in the U.S.-China Clean Energy Research Center (CERC) and any other related efforts, do you believe that the U.S. is currently a leader in the carbon capture utilization and sequestration field? How does the U.S. maintain leadership moving forward?*

The U.S. is among the world's leaders in developing technology approaches to carbon dioxide (CO_2) capture and utilization (CCUS) technologies, particularly with respect to the subsurface storage of CO_2 in saline reservoirs and the utilization of CO_2 for enhanced oil recovery (CO_2-EOR). Indeed, the U.S. leads the world on CO_2-EOR technologies and commercial operations, with states such as Texas and Wyoming in the vanguard.

We are gaining in the newer areas of CO_2 utilization for non-geologic applications, but I cannot state with certainty that we are among the international leaders in this area. The National Coal Council, in its 2016 study "CO_2 Building Blocks: Assessing CO_2 Utilization Options" with the University of Wyoming (UW) as the study chair, looked at this topic and concluded in part -- and with consideration of both geologic and non-geologic markets -- that "CO_2-EOR currently [remains] the most immediate, highest value opportunity to utilize the greatest volumes of anthropogenic CO_2, with the greatest near-term potential to incentivize CCUS deployment."[1]

The entire enterprise of CCUS requires funding and industry partners operating large-scale combustion equipment for demonstrations to move forward. The U.S. can only maintain a leadership position by demonstrating the efficacy of our technologies at scale. The Wyoming Integrated Test Center is one such effort, but more is needed.

3. *Do you see an international market potentially developing for products and technologies that the University of Wyoming School of Energy Resources is researching, such as carbon capture technologies and non-Btu uses of coal and coal by-products?*

Worldwide demand for lower greenhouse gas (GHG) emitting technologies and products is almost certainly going to continue to increase in the future for a variety of market, legal, regulatory and policy reasons. At the R&D and applied research levels, we continue to see growing interest among international colleagues with respect to UW's work on CCUS and related technologies.

With respect to non-Btu uses of coal and coal by-products, such technologies are generally developed to take advantage of a particular coal. In the case of Wyoming coals being researched at UW, it is likely that successfully developed coal-to-non-Btu product technologies will be bundled with Wyoming coal sales. Target markets are Japan, India, Taiwan and China.

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[1] *See generally*, National Coal Council. "CO_2 Building Blocks: Assessing CO_2 Utilization Options." (2016) (available at http://www.nationalcoalcouncil.org/studies/2016/NCC-CO2-Building-Block-FINAL-Report.pdf).

4. *An important use of carbon dioxide is in enhanced oil recovery (EOR) operations. Given your leadership at the Carbon Management Institute, you have expertise in studying the fate of carbon dioxide that is stored underground. Can you describe past or ongoing research at the University of Wyoming to demonstrate that the carbon dioxide used for EOR or injected for some other purpose stays in the ground over time? How do we make sure that policies governing carbon sequestration and storage are formed by the best available science?*

UW has a world-leading experimental and computational research capability for reservoir characterization and flow through porous media. One mature area of research being carried out in that program addresses the oil production benefits and fate of CO_2 that has been injected into reservoirs for CO_2-EOR and the associated storage of CO_2 that occurs as part of that process. UW's work has resulted in a number of publications that are among the most frequently cited in renowned scientific journals. Briefly, UW's work shows that many reservoir types result in the permanent trapping of a significant volume of the injected CO_2 in pore spaces. The amount trapped in this manner varies by reservoir, but we believe such studies provide many benefits such as reducing the costs of storage and making more efficient (but not necessarily eliminating) the need for monitoring, verifying and accounting for the stored CO_2. Cutting-edge research into the interactions at the pore space (e.g., micro) and atomic (e.g., nano) levels is currently being conducted at UW's High Bay Research Facility under the leadership of Dr. Mohammad Piri and a large team of researchers.

Over the past decade, UW – led by the Carbon Management Institute (CMI) with the participation of colleagues on campus, national labs and industry partners, and with the support of DOE and the State of Wyoming – has researched the geologic attributes of CO_2 storage in many reservoirs. We have applied and advanced – and continue to apply and advance – the best available science in these projects.

The Wyoming Carbon Underground Storage Project (WY-CUSP), for example, concluded that two reservoirs (the Weber Sandstone and Madison Limestone, both deep saline formations) on the Rock Springs Uplift in southwestern Wyoming could safely store billions of tons of CO_2 thousands of feet underground.

In conjunction with colleagues at West Virginia University, the University of Kentucky and elsewhere under the DOE-funded U.S.-China Clean Energy Research Center, we are working to assess CO_2 storage in association with CO_2-EOR operations in China's Ordos Basin. It is anticipated that lessons learned from this ongoing research will be broadly applicable in the United States.

Under Phase I of DOE's Brine Extraction & Storage Test (BEST) program, we conducted desk-top studies related to brine withdrawal to manage reservoir pressure as part of CCUS operations while examining the potential beneficial use of produced brine.

UW-led research on other CCUS-related projects is underway in Wyoming.

Separately, CMI and the Casper-based Enhanced Oil Recovery Institute (EORI) concur that the critical importance of CO_2-EOR to carbon management policy, coupled with the growing application of GHG lifecycle analysis (LCA) to CO_2-EOR, suggest that it is important for policymakers and technologists to be armed with the most current data on CO_2 storage in association with commercial CO_2-EOR operations. Current CO_2-EOR operations are achieving much higher CO_2 utilization values -- and assuming the wide-scale application of "next generation" technologies to existing and potential new resource targets, even larger CO_2 utilization values are realizable. Recent research suggest that "next generation" CO_2-EOR applied to the main pay zone of oil reservoirs uses, on average, about 0.45 metric tons per barrel of oil produced, while CO_2-EOR applied to the residual oil zone underlying and in between existing oil fields uses, on average, about 0.50 metric tons per barrel of oil produced. These utilization values are over double that assumed in most LCA analyses applied to CO_2-EOR operations to date. In conjunction with other experts in the field, CMI and EORI have published on this topic.

Given the fact that most if not all CO_2-EOR operations have to purchase CO_2, operators treat CO_2 as a commodity and do all that they can to ensure that CO_2 in the closed-loop CO_2-EOR system stays in the system. This means that the CO_2 is either in the recycling system or stored in the reservoir. Because the storage of CO_2 occurs "incidentally" to the production of oil and gas, this type of CO_2 storage (e.g., occurring as part of a commercial CO_2-EOR operation) is referred to as associated storage.

Some regulatory and liability issues are currently hindering wide-scale deployment of CCUS, including the recognition of CO_2 stored in association with CO_2-EOR. These and related issues are being examined by a global effort currently underway by the International Standards Organization (ISO) under ISO's Technical Committee 265 ("Carbon dioxide capture, transportation, and geological storage"). There are currently 29 countries participating in this effort, which includes a significant focus on the permanent storage of CO_2 in association with CO_2-EOR operations. The U.S. Head of Delegation and Chair of Technical Committee 265 is the director of EORI, Dr. Steven Carpenter.

* * *

On behalf of UW, we would be pleased to answer any further questions that you may have.

Best regards,

Kipp Coddington, Esq.

Additional Resources

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Nye, C. et seq. "Aqueous Rare Earth Element Patterns and Concentration in Thermal Brines Associated with Oil and Gas Production." Proceedings, 42nd Workshop on Geothermal Reservoir Engineering (2017) (available at https://pangea.stanford.edu/ERE/db/GeoConf/papers/SGW/2017/Nye.pdf).

Surdam, R. (ed.). "Geological CO_2 Storage Characterization: The Key to Deploying Clean Fossil Energy Technology." (Springer 2013).

"UW Seeks New Coal Uses to Boost Economy." Laramie Boomerang (December 6, 2017) (available at http://www.laramieboomerang.com/news/local_news/uw-seeks-new-coal-uses-to-boost-economy/article_356245f6-da40-11e7-9661-7ffedf4b258a.html).

Senator BARRASSO. Thank you very much for your testimony, Mr. Coddington. We will get to questions after we finish with the rest of the panel.

Mr. Eisenberg, please proceed.

STATEMENT OF ROSS EISENBERG, VICE PRESIDENT, NATIONAL ASSOCIATION OF MANUFACTURERS

Mr. EISENBERG. Good morning, Mr. Chairman, Ranking Member Carper, members of the Committee. My name is Ross Eisenberg. I am pleased to provide testimony on the wonderful—the very good things that manufacturers are doing to improve emissions in this country and usher in a more sustainable environment.

Through a wide range of traditional and innovative measures, manufacturers have sharply reduced their emissions and have helped usher in this new era. Since 1990 the national pollution concentrations have—it is really a remarkable thing. All the trendlines on pretty much every single major pollutant have gone straight down. Carbon monoxide concentrations are down 77 percent; lead, 99 percent; nitrogen dioxide, 54 percent; ozone, 22 percent; coarse particulate matter, 39 percent; fine particulate matter, 37 percent; and sulfur dioxide, 81 percent.

As you said in your opening remarks, Mr. Chairman, we have reduced more greenhouse gases than any other nation on earth.

When you narrow this analysis to the industrial sector, you get similarly impressive results. Today's manufacturing company would like to say it is not your father's or even your grandfather's manufacturer; it is a sleek, technology driven operation that looks nothing like industrial facilities of the past. And with that progress has come a much smaller environmental footprint. Industrial emissions of nitrogen oxide, which is a criteria pollutant and the main driver of ozone, they have dropped by 53 percent in the industrial sector since 1970. Industrial emissions of volatile organic compounds, VOCs, the other pollutant that makes up ozone, are down 47 percent during that same timeframe. Carbon monoxide is down 70 percent in our sector since 1970. Sulfur dioxide, 90 percent. Emissions of coarse particulate matter in the industrial sector are 83 percent down since 1970; fine particulate matter, 23 percent since their peak in 1999. And on greenhouse gases, the industrial sector manufacturing actually emits less than we did in 1990. Just over the past decade, we have reduced our greenhouse gas emissions by 10 percent, while increasing our value of the economy by 19 percent in that same timeframe.

So, across the board, manufacturers are truly walking the talk. My written statement provides a wealth of examples that were sent to me by our manufacturers from companies like Olin, Xerox, Cummins, Johnson Controls, Owens Corning, Illinois Tool Works, and many others.

My testimony highlights Covestro, which committed to reduce its 2005 CO_2 levels by 40 percent by 2020. They have already beaten that, so they set another target of cutting that in half by 2025.

The ASF's Huntsville, Alabama, facility implemented materials management and recycling activities that saved more than 1,500 metric tons of VOCs and 35,000 metric tons of CO_2.

Calgon Carbon, up in Pennsylvania, manufactures activated carbon products. They control mercury emissions from power plants, industrial boilers, and cement kilns.

The steel manufacturer ArcelorMittal installed a $63 million energy recovery system that captures their off-gas, their blast furnace gas, and uses it, instead of it being wasted, to produce steam to generate electricity, which reduces their annual CO_2 emissions by 340,000 tons.

There are literally thousands more across the country doing groundbreaking work to make themselves more sustainable, and they have names you know, like Hershey, and Subaru, and Clorox, and Pfizer; and names you might not know, like Nalco, FuelTech, L.S. Starrett. These companies are developing and installing technologies that reduce the emissions from reducing energy. They are making changes to their processes, and they are reducing their emissions right there on the shop floor. They are developing these technologies with an eye toward exporting them around the world and helping others.

Now, there do remain barriers to accomplishing even more, but one I would like to focus on, as I do in my written statement, is New Source Review, a Federal air permitting program that applies to new facilities or major modifications. In practice, NSR has become a barrier to efficiency upgrades and the installation of modern pollution control equipment. The ups and downs of NSR can result in years-long delays, high modeling costs, citizen suits, and enforcement actions. And that is assuming you actually get the permit. Many simply just won't bother.

For instance, if a manufacturer installs selective catalytic reduction technology to reduce NO_x emissions, the components can trigger NSR for that facility for all emissions, requiring a full comprehensive review. That is a lot of risk to shoulder for the installation of, really, just one component.

One manufacturer reports that customers have asked it to de-optimize performance in a suite of efficiency upgrades in order to avoid triggering NSR. And NSR notice of violation have been issued for environmentally beneficial projects like economizer replacement, steam turbine upgrades, feedwater heater replacements, and similar activities.

Even worse, NSR presents a very big impediment to the installation of the more efficient technologies that are going to be used to control climate change. In comments to the draft Clean Power Plan, the Utility Air Regulatory Group submitted an attachment that had 400 individual projects that would have increased the efficiency of power plants, only to be targeted by the EPA or citizen suits with NSR violations. That can't possibly be what Congress intended when it set up this program.

So, the NAM urges this Committee to work closely with EPA to fix NSR so that it functions properly and doesn't stand in the way of efficiency.

Manufacturers have established a strong environmental protection record, and we strive to reduce the environmental footprint of our operations and become more sustainable. The results are already very impressive, and they get better with each passing year. However, as my testimony shows, barriers do still exist. The NAM

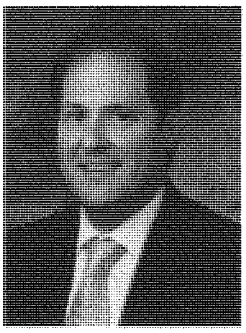
hopes it can work with this Committee to reduce these barriers and help solve the environmental challenges of current and future generations.

Thank you.

[The prepared statement of Mr. Eisenberg follows:]

Ross Eisenberg

Vice President, Energy and Resources Policy



Ross Eisenberg is vice president of energy and resources policy at the National Association of Manufacturers (NAM). Mr. Eisenberg oversees the NAM's energy and environmental policy work and has expertise on issues ranging from energy production and use to air and water quality, climate change, energy efficiency and environmental regulation. He is a key voice for manufacturing on Capitol Hill, at federal agencies and across all forms of media.

Before coming to the NAM in 2012, Mr. Eisenberg spent more than five years as environmental and energy counsel at the U.S. Chamber of Commerce, the world's largest business federation. He was also executive for the Chamber's Environment & Energy Committee, the Chamber's primary vehicle for the creation and development of environmental and energy policy.

Prior to joining the Chamber, Mr. Eisenberg spent five years as an environmental, energy and insurance coverage attorney in the Washington, D.C., office of Greenberg Traurig LLP, a full-service international law firm with more than 1,700 lawyers. At Greenberg Traurig, Mr. Eisenberg represented large and small companies on a wide range of environmental and energy matters, including permitting and compliance with federal, state and local laws and regulations; pesticide registration; rights of way and ratemaking; environmental insurance coverage; and assorted litigation.

Mr. Eisenberg is a member of the State Bar of the District of Columbia. He has a B.A. from Emory University and a J.D. from Washington and Lee University School of Law.

NATIONAL ASSOCIATION OF
Manufacturers

Leading Innovation, Creating Opportunity, Pursuing Progress

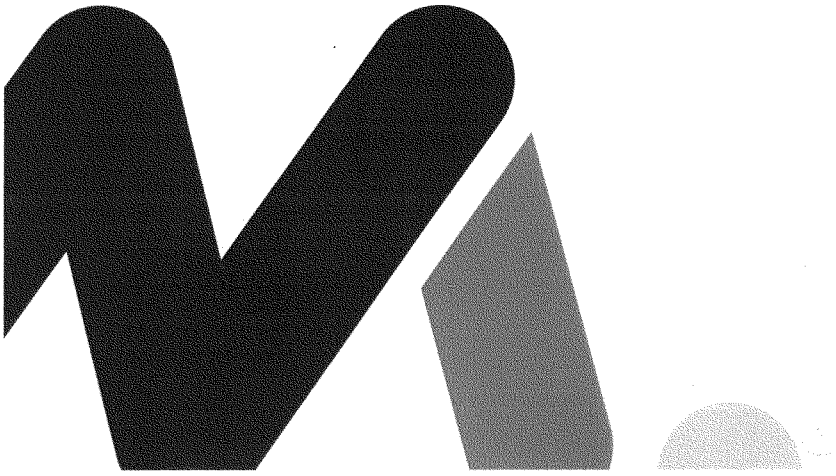
Testimony

of Ross Eisenberg
Vice President
Energy and Resources Policy
National Association of Manufacturers

before the Senate Committee on Environment and Public Works

on "Promoting American Leadership in Reducing Air Emissions Through Innovation"

November 15, 2017



TESTIMONY OF ROSS EISENBERG

BEFORE THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

Hearing on:
"Promoting American Leadership in Reducing Air Emissions Through Innovation"

NOVEMBER 15, 2017

Good morning, Chairman Barrasso, Ranking Member Carper and members of the Environment and Public Works Committee. My name is Ross Eisenberg, and I am the vice president of energy and resources policy at the National Association of Manufacturers (NAM). The NAM is the nation's largest industrial trade association, representing nearly 14,000 small, medium and large manufacturers in every industrial sector and in all 50 states. I am pleased to represent the NAM and its members and provide testimony on manufacturers' continued commitment to reduce air emissions.

Manufacturers have sharply reduced our impact on the environment through a wide range of innovations, such as increasing energy efficiency, saving and recycling water and implementing successful initiatives to reduce pollution and waste. Through these traditional and innovative measures, manufacturers have helped to usher in a new era of a cleaner and more sustainable environment.

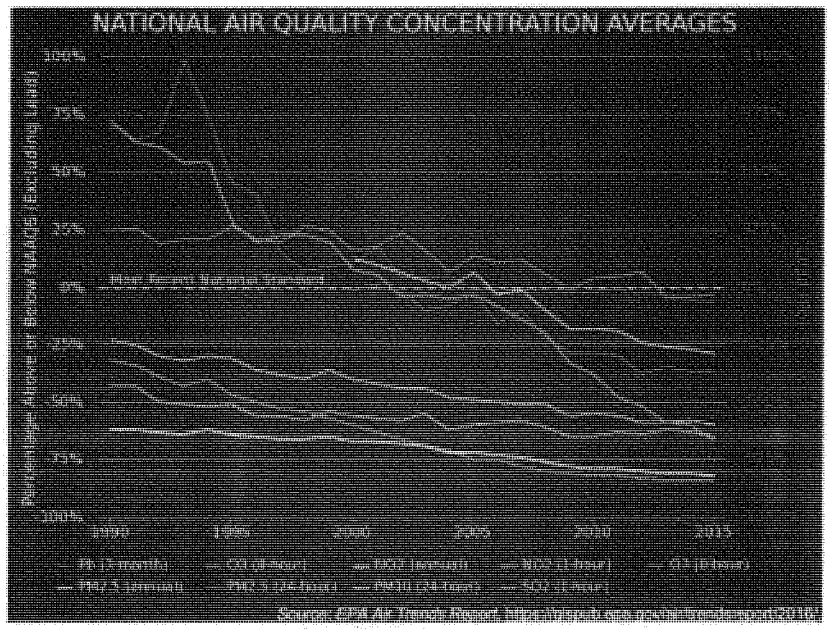
My written statement is broken into three parts. The first reviews air emission trends in the U.S. and the manufacturing sector. The second provides an overview of the technologies and innovative solutions manufacturers have developed to reduce their emissions. The third part identifies barriers that are

preventing manufacturers from doing even more to reduce emissions and increase efficiency.

Part One: U.S. and Manufacturing Sector Air Trends

A. Economy-Wide Emissions

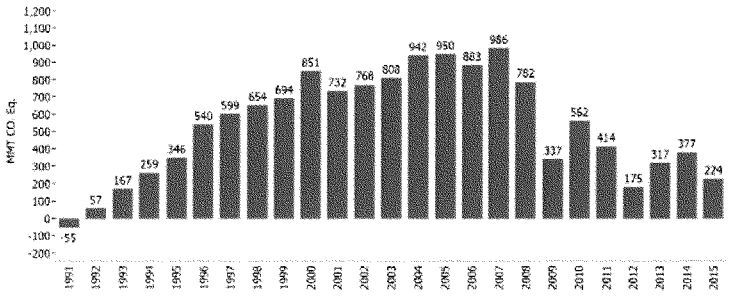
The story of U.S. air pollutant emissions is a positive one. Since 1990, a period spanning four different presidential administrations and 14 different Environmental Protection Agency (EPA) administrators, national pollutant concentrations have dropped dramatically. Carbon monoxide concentrations are down 77 percent; lead 99 percent; nitrogen dioxide 54 percent; ozone 22 percent; coarse particulate matter 39 percent; fine particulate matter 37 percent;



and sulfur dioxide 81 percent.[1]

On greenhouse gases (GHGs), the United States has made greater reductions over the past decade than any other nation on earth.[2] The following chart from the EPA's most recent *Inventory of U.S. Greenhouse Gas Emissions and Sinks* shows the positive trends.

Figure ES-3: Cumulative Change in Annual Gross U.S. Greenhouse Gas Emissions Relative to 1990 (1990=0, MMT CO_2 Eq.)



Source: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2015

B. Manufacturing Sector Emissions

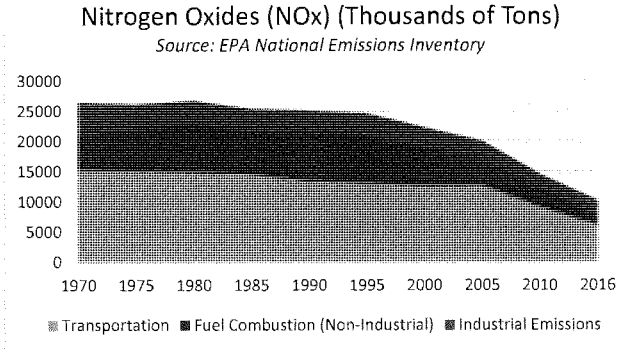
While it is useful to view the emissions reduction trends of the broader economy, it is worth focusing on the industrial sector's emissions and how they have decreased over time. For virtually every air pollutant regulated by the EPA, the manufacturing sector has made dramatic reductions over the past few decades. Today's manufacturing company is a sleek, technology-driven

[1] U.S. EPA, "Our Nation's Air: Status and Trends Through 2015," *available at* https://gispub.epa.gov/air/trendsreport/2016/.
[2] https://www.forbes.com/sites/rrapier/2016/06/19/the-u-s-leads-all-countries-in-lowering-carbon-dioxide-emissions/#7d6790375f48.

operation that looks nothing like the industrial facilities of the past. With that progress has come a smaller environmental footprint.

Nitrogen Oxides (NOx)

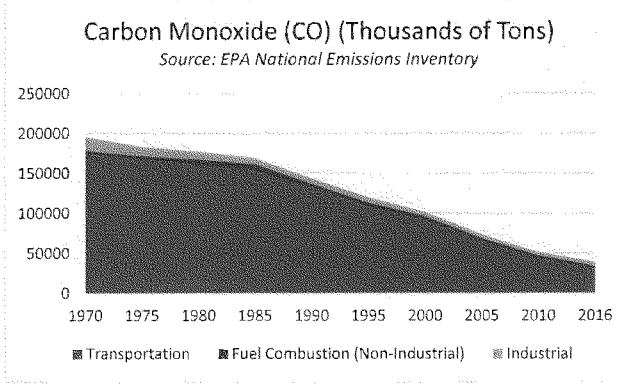
In the case of nitrogen oxides (NOx), a criteria pollutant and the primary precursor of ozone, industrial emissions have dropped by 53 percent since 1970. The vast majority of the decline has come from technologies to reduce NOx emissions at onsite industrial power generation facilities. Industrial NOx emissions have historically represented around 15 to 25 percent of total NOx emissions in the United States.



Carbon Monoxide (CO)

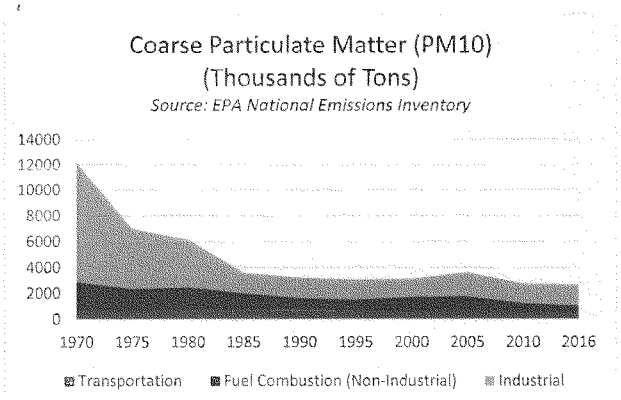
The manufacturing sector's carbon monoxide (CO) emissions have dropped 70 percent since 1970. Most of these reductions have come through improvements to the manufacturing process. The chemical sector has reduced its CO emissions a staggering 96 percent; metals processing has reduced its CO

emissions 83 percent; petroleum and related industries have reduced their CO emissions 61 percent; and waste disposal and recycling industries have reduced their CO emissions 70 percent. Overall, manufacturing CO emissions are relatively small compared to overall CO emissions. However, these emissions have also dropped dramatically over time, a 71 percent reduction.



Coarse Particulate Matter (PM10)

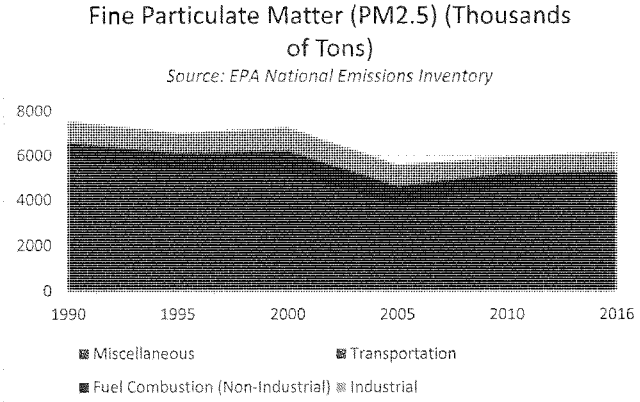
Manufacturers have reduced their emissions of coarse particulate matter, or PM10, by 83 percent since 1970. The vast majority of these reductions have come from changes to the manufacturing process across individual sectors. For instance, chemical manufacturers have reduced their PM10 emissions by 91 percent; metals processing has reduced its PM10



emissions by 96 percent; petroleum and related industries have reduced their PM10 emissions by 87 percent; and waste disposal and recycling industries have reduced their PM10 emissions by 70 percent. It is worth noting that the lion's share of PM10 emissions tracked by the EPA are not from industry, transportation or electricity production; they are what the EPA calls "miscellaneous" PM10, which include wildfires, windblown dust from open lands, wood burning stoves and fireplaces and dust from construction and agriculture. Miscellaneous PM10 represents almost 90 percent of total PM10 in the United States today.

Fine Particulate Matter (PM2.5)

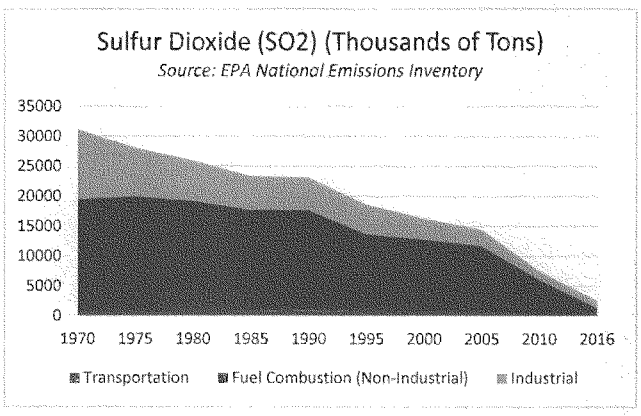
Like PM10, the bulk of the fine particulate emissions measured by the EPA are classified as "miscellaneous," meaning not from industrial, transportation or power generation sources. Overall, total PM2.5 emissions from industrial, transportation and power generation sectors have dropped by 25 percent since 1990, the first year the EPA began measuring this pollutant. The industrial sector has reduced its PM2.5 emissions 6 percent since 1990 and 23 percent since its peak in 1999 and



will continue to reduce its emissions significantly as manufacturers take steps to comply with the 2012 Boiler MACT regulation.

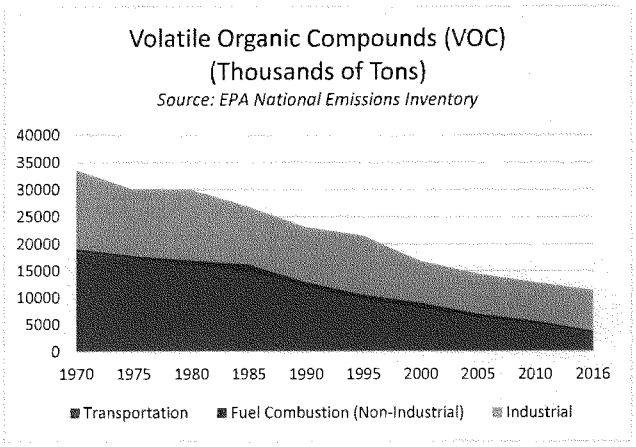
Sulfur Dioxide (SO2)

Sulfur dioxide (SO2) emissions have dropped precipitously over the past four decades. Since 1970, the industrial sector has reduced its SO2 emissions by 90 percent; electric utilities and other fuel combustion sources have reduced their SO2 emissions by 93 percent; and the transportation sector has reduced its SO2 emissions by 91 percent. Within manufacturing specifically, the chemical sector has reduced its SO2 emissions by 80 percent; metals processing has reduced its SO2 emissions by almost 98 percent; petroleum and related industries have reduced their SO2 emissions by 88 percent; and other industrial processes reduced their SO2 emissions by 80 percent. Manufacturers accomplished these dramatic reductions through technologies that allowed them to burn energy with less emissions, as well as technologies that reduced the SO2 emissions in the manufacturing process.



Volatile Organic Compounds (VOCs)

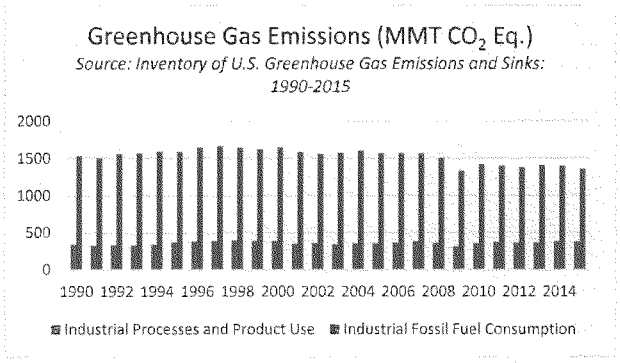
Emissions of volatile organic compounds (VOCs), which mix with NOx to form ground-level ozone, have also been reduced considerably. Since 1970, manufacturers have reduced their VOC emissions by 47 percent; the transportation sector has reduced its VOC emissions by 82 percent; and the power generation fleet has reduced its already-small emissions of VOCs by 26 percent. The vast majority of the manufacturing sector's VOC reductions have come through changes to the manufacturing process; the introduction of new chemicals, feedstocks and technologies; or reformulation of products. For instance, California's South Coast Air Management District reports that VOCs from architectural coatings in the Los Angeles area decreased more than 50 percent between 2008 and 2014.[3]



[3] http://www.paint.org/about-our-industry/environmental-footprint/.

Greenhouse Gases (GHGs)

The manufacturing sector emits greenhouse gases (GHGs) in two ways: during energy production and through industrial processes and product use. The good news is that the industrial sector actually produces *less* emissions than it did in 1990, a considerably different story compared to the broader U.S. economy.[4] Just over the past decade, manufacturers have reduced our GHG emissions by 10 percent while increasing our value to the economy by 19 percent. Many of those reductions have come from improved energy efficiency and changes to the mix of fuels manufacturers use.



Part Two: The Innovations Manufacturers Are Using to Clean Up the Air

The aforementioned charts are not meant to suggest that our environmental problems are over. Despite best-in-class efforts, the United States and the world continue to face serious environmental and sustainability challenges. There are forces far beyond the control of manufacturers in the United States that are driving changes to the global environment. The world's

[4] Inventory of U.S. Greenhouse Gas Emissions and Sinks, 1990-2015, *available at* https://www.epa.gov/sites/production/files/2017-02/documents/2017_complete_report.pdf.

population is expected to grow from 7.6 billion people today to 9.7 billion by 2050; 795 million people in the world do not have enough food to lead a healthy, active life; 1.3 billion people lack access to electricity; and droughts and other natural disasters threaten many already environmentally and economically stressed parts of the world. Mitigating the impacts of climate change, protecting the air, feeding the world's growing population and ensuring adequate supplies of drinking water are just a few of the significant issues facing current and future generations.

Manufacturers have demonstrated a commitment to protecting the environment through greater sustainability, increased energy efficiency and reducing emissions. We will continue to lead by minimizing environmental footprints, reducing emissions, conserving critical resources, protecting biodiversity, limiting waste and providing safe products and solutions so others in the economy can do the same.

For instance, to control SO2, acid gas and particulate matter emissions, manufacturers develop and install wet scrubbers, dry scrubbers with fabric filters, dry sorbent injection technologies and electrostatic precipitators. These technologies have been effective in controlling emissions on industrial boilers, at cement kilns, petroleum refineries, glassmaking facilities, lime kilns, coke manufacturing, chemical plants, pulp and paper facilities, brickmaking plants, asphalt and ferrous metals plants. Manufacturers have developed cost-effective

technologies that can remove up to 95 percent of PM, 95 percent of SO2 and 90 percent of acid gases.[5]

To control VOCs, manufacturers develop and install technologies such as ventilation air methane systems, afterburners, regenerative oxidizers, catalytic systems, recuperative oxidizers and absorbers. Controls are deployed over a wide range of industries—including petrochemical, chemical, pharmaceutical, wood products, painting, coating, electronics and oil and gas—and are capable of up to 99 percent VOC destruction.

To control NOx and CO, manufacturers develop and install Selective Non-Catalytic Reduction (SNCR) technologies, catalysts, Low-NOx Burners and Catalytic Reduction technologies. These are used on combustion sources, such as boilers, turbines, engines, process heat, iron and steel, lime kilns, glass and cement. These technologies control for CO up to 99 percent efficiency at more than 1,000 power plants and industrial boilers across the United States and can remove greater than 95 percent of NOx at temperatures ranging from 300°F to 2,000°F.

Controlling GHGs is a considerably different task than the conventional pollutants above. There is no ready-made, bolt-on technology solution to reduce GHGs from industrial operations or the products we manufacture. This is forcing manufacturers to get creative to achieve strong GHG reductions. Manufacturers of all shapes and sizes are setting GHG targets to 2020, 2025 and beyond—and

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[5] *See, e.g.*, The Institute of Clean Air Companies, Domestic Conventional Pollutants Division and Emissions Management Division, Issue Brief, *available at* http://www.icac.com/?page=DomConvPollutants.

are often beating them several years early. They are doing this by innovating, taking risks, driving efficiencies, streamlining their processes and relying on internal experts who know their businesses best.

Every manufacturer's operation is unique. That diversity is part of the challenge, but it can also lead to breakthroughs and innovation. We asked our members to send us examples, in their own words, of success stories in deploying environmental solutions at their facilities. Here are their stories.

MGK is a Minneapolis-based manufacturer that develops branded and custom insect control solutions. It recently lowered the VOC load in its aerosol and liquid products by levels between 30 and 70 percent. Some of this was done by shifting from solvent-based formulas to water-based formulas, and some came from lowering the use of hydrocarbon propellants in aerosols. MGK also lowered conventional pollutant emission rates by adding scrubbers to its stacks and reduced its use of methylene chloride by amending its production process to require fewer clean-out events and finding alternate solvents to use in clean-outs.

Gerdau Long Steel North America is in the process of upgrading its steel mill in Rancho Cucamonga, California—the only steel mill in the state—with a $23 million emissions control system that will be used to meet new South Coast Air Quality Management District air emission regulations, which are some of the most stringent in North America. This state-of-the-art environmental control system project took two years to design, and the design process alone cost $2 million. When completed, the system will capture 99.9 percent of contaminants in

the emissions from the mill, making the Gerdau Rancho Cucamonga steel mill one of the world's greenest.

Xerox has taken strong steps to reduce its environmental footprint. The company has focused on reducing the emissions that originate from the production of imaging supplies, such as toner, photoreceptor drums and belts and fuser rolls. Xerox has managed to reduce emissions through process modification, lower production volumes of legacy products coated using organic solvents and producing components with longer life spans, which results in fewer replacement components produced. The release of materials used in Xerox's worldwide operations is evaluated annually and reported to government agencies under national toxic chemical release reporting regulations, such as the U.S. TRI, the Canadian National Pollution Release Inventory and the European Pollutant Release and Transfer Register. Releases for reporting year 2016 remained unchanged compared to 2015 levels and were 75 percent lower than 2007 levels.

Nucor pioneered a new way of steelmaking when it introduced the mini-mill, an electric arc furnace with a considerably smaller environmental footprint than a traditional blast furnace: per ton of steel, the mini-mill results in a 99.2 percent reduction in particulate matter, an 86 percent reduction in SO2, an 80 percent reduction in NOx, a 91 percent reduction in CO and a 71 percent reduction in VOCs.[6] The company recently introduced the micro-mill, a facility

[6] http://www.nucor.com/responsibility/sustainability/highlights/.

with an even smaller environmental footprint than mini-mills, and it announced this fall that it is seeking to build a new micro-mill in the United States.[7]

At the chemical manufacturer Olin Corporation, employees within manufacturing and engineering, logistics and supply chain are encouraged to conceptualize, develop and execute productivity enhancement projects each year. The top 60 projects that deliver significant productivity gains are then presented by the global project teams to the company's top leadership in a conference setting. Providing an opportunity to leverage ideas, share opportunities and recognize the efforts and achievements of the project teams, the event serves as both a valuable development opportunity for employees and helps build further best practices for productivity and efficient, sustainable manufacturing practices throughout the organization.

Air Products and Chemicals has reduced its hazardous air pollutant (HAP) emissions by 82 percent and SO2 emissions by 60 percent since 2010. The company also develops a wide range of products and technologies that help manufacturers reduce their own emissions. Air Products' Helia® advanced oxidation technology reduces VOC emissions from wastewater treatment plants; it produces hydrogen used in refining to produce cleaner transportation fuels and to power advanced fuel cell vehicles; and its biogas membrane separators purify methane from farm waste, manure and municipal waste and help turn it into energy.[8]

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[7] https://www.prnewswire.com/news-releases/nucor-board-of-directors-approves-steel-bar-micro-mill-project-and-merchant-bar-operations-expansion-300520418.html.
[8] http://www.airproducts.com/~/media/Files/PDF/company/2017-sustainability-report.pdf?la=en.

Covestro, formerly Bayer MaterialScience, committed to reduce its 2005 carbon dioxide (CO_2) levels by 40 percent by 2020. The company has already beaten that goal and set a new goal to cut CO_2 emissions in half again by 2025. It accomplished this by making numerous production improvements at Covestro facilities across the globe, including a $120 million investment at its largest facility in Baytown, Texas, to improve energy efficiencies, minimize waste and reduce natural resource consumption. Covestro developed a new manufacturing process that allows it to replace petrochemical feedstock with CO_2 and recently opened a new plant that will utilize this technology to make polyurethane foam for mattresses and furniture.

In the fall of 2012, steel manufacturer ArcelorMittal partnered with the federal government to install a 38-megawatt combined heat and power system to utilize previously wasted blast furnace gas (BFG), a by-product of the iron making process, to produce electricity on-site at its Indiana Harbor, Indiana, complex, the largest steelmaking facility in North America. The $63.2 million waste energy recovery system captures approximately 46 billion cubic feet of BFG from the facility's No. 7 blast furnace and uses it to produce steam to generate electricity. The installation lowered the facility's annual energy costs by nearly $20 million and reduced annual CO_2 emissions by 340,000 tons. In addition, the project created approximately 360 manufacturing and construction jobs and helped retain 4,850 employees at the facility by lowering the production costs of steel by $5 per ton.

BASF's global leadership in emissions reduction technologies for the automotive industry began in the 1960s with the creation of the catalytic converter by scientists working in Iselin and Union, New Jersey. In 2002, BASF's scientists earned an award for their work on the three-way catalyst, a key contributor to cleaner air for billions of people in the United States and around the world. More recently, BASF has continued to move the industry forward with the development of a four-way conversion catalyst that will reduce emissions of PM in addition to CO, NOx and HCl. The three-way catalysts are produced at BASF's Huntsville, Alabama, facility, a site that walks the talk of environmental stewardship and recently celebrated the production of the 400 millionth catalyst. All 650 employees are actively engaged in not only producing sustainable solutions for the automotive industry but also ensuring their own operations are just as sustainable. This summer, they were certified a virtual zero waste to landfill facility, one of only three manufacturing facilities in all of North America that is currently valid to UL Environment's UL 2799 certification. Their overall material management and recycling activities saved more than 35,000 metric tons of CO_{2e} emissions and 1,500 metric tons of non-methane VOCs. Last month, they were awarded the Air Pollution Control Achievement Award by the city of Huntsville for their recent site-wide LED conversion lighting project, which saved more than 1,000,000 kilowatt-hours per year of electricity (a 57 percent reduction) and reduced greenhouse gas emissions by more than 730 metric tons per year.

Calgon Carbon Corporation is a global leader in innovative solutions, high-quality products and reliable services designed to protect human health and the environment from harmful contaminants in water and air. As a leading manufacturer of activated carbon, with broad capabilities in ultraviolet light disinfection, Calgon Carbon provides purification solutions for drinking water, wastewater, pollution abatement and a variety of industrial and commercial manufacturing processes. One of the company's signature achievements has been the development of activated carbon-based products to control mercury emissions from coal-fired power plants, industrial boilers and cement kilns. Although the status of the regulations was an uncertain and winding road over the past decade, Calgon Carbon proactively invested more than $30 million to develop a better understanding of the issue, new products that delivered necessary mercury capture performance and new production capacity to meet the uncertain future demand. These products are being used by electric utilities to comply with the Mercury and Air Toxics Standard Rule.

Global engine manufacturer Cummins has a long history of setting and exceeding energy and GHG reduction goals at its facilities and operations. At the company's high-horsepower engine plant and technical center in Seymour, Indiana, Cummins made a $5 million investment in advanced energy-efficiency technology called regenerative dynamometers, which convert engine power from test cells to electricity that can be used onsite and exported to the grid. This innovative approach to energy efficiency will help Cummins reduce electricity consumption by 14,000 MWh per year and reduce electricity costs by $1.2 million

per year. The ability to net-meter this energy and to sell energy back to the grid has allowed Cummins to make this investment worthwhile. Cummins' engine plant in Jamestown, New York, recently showcased its latest initiative, a $47 million block machining line that utilizes on-demand hydraulics, coolant and pneumatics to reduce energy consumption as it produces the company's high-efficiency diesel and natural gas heavy-duty engines. Among other improvements, the plant in recent years has also replaced nearly 3,000 fluorescent lights with advanced LED lighting and a Wi-Fi-enabled control system that can automatically shut the lights off in parts of the plant not in use. National Grid, one of the largest investor-owned energy companies in the world, partnered with Cummins to invest $692,000 into the project as part of an effort to incentivize customers to use energy-efficient lighting, controls, heating and air-conditioning equipment and more. The plant's roof, meanwhile, has a nearly 2MW solar panel installation that on a sunny day will produce more than 20 percent of the facility's electric power needs.

In 2013, ConocoPhillips' Eagle Ford fugitive emissions team began to identify and eliminate equipment emission sources, beginning with leaks from tank thief hatches, wellsite controllers and flares. The team uses infrared camera technology to find emission leaks and follows up to ensure problems are addressed. The program has evolved into a planned preventive maintenance program encompassing all field sites. The fugitive team or a follow-up crew repairs the leaks. Data are recorded in the SAP work order system, and a detailed worksheet documents the emission history and associated work

performed. Documentation includes confirmation that the observed problems were addressed. A preventive maintenance schedule ensures that every site is inspected at least once a year. This proactive model demonstrating an effective way to manage fugitive emissions has been adopted across the company's Lower 48 business unit. In addition, Eagle Ford Operations has installed automation and centralized alarming to proactively maintain lit flares. All flares are alarmed to register flare-outs and to signal the Eagle Ford Integrated Operations of the Future team of any incident.

Owens Corning has set an aggressive target for reducing its GHG emissions—50 percent below 2010 levels by 2020—and is taking its commitment one step further, reducing the embodied carbon emitted throughout the product lifecycle, including raw material extraction, transportation and manufacture. Just last week, the company announced three new types of insulation made with 100 percent–certified wind energy. These products are intended to give commercial architects and specifiers, builders and even homeowners the option of lower-carbon products to build greener structures.

Energy Transfer Partners (ETP) operates from the position that emission reductions are rooted in building and operating safe, well-maintained and reliable facilities to prevent accidents from happening. ETP has for several years utilized FLIR infrared cameras to survey for natural gas leaks at its natural gas compression stations and treating plants. The program originated as a safety initiative to ensure that hazardous conditions did not exist for employees and has also evolved into an operations reliability program to reduce lost product and

identify maintenance issues. ETP was surveying for natural gas leaks long before regulations were promulgated by the EPA. ETP also utilizes LIDAR aerial technology to survey pipelines for leaks. This early detection technology can identify very small leaks by measuring vegetation disturbance and/or using hydrocarbon detection. This program prevents larger spills and releases and reduces repair and cleanup costs that are associated with a pipeline failure. Finally, at ETP's King Ranch Gas Processing Plant, ETP's engineering and safety requirements led the company to replace two in-service Light Petroleum Distillate (LPD) tanks with state-of-the-art pressurized tanks. Replacement of the original tanks with new pressurized tanks essentially eliminated all VOC emissions associated with storage of the LPD product—a net reduction of approximately 10 tons per year of VOC.

Johnson Controls has made substantial emissions reductions across its U.S. manufacturing portfolio. A key part of this has been its engagement with the Department of Energy's (DOE) Better Plants program, which helps manufacturers improve the energy efficiency of their operations. The Better Plants program offers a variety of solutions and resources for partners, including materials, tools, webinars and on-site visits to help identify energy savings opportunities. Johnson Controls joined the DOE Better Buildings Better Plants Challenge in 2013, and it set a goal of a 25 percent reduction in energy intensity in 10 years, using a 2009 baseline, for its manufacturing facilities located in the United States. This year, Johnson Controls was recognized by the Better Plants program with two awards: (1) the Better Plants, Better Practice Award for

establishing a company-wide Energy Hunt program as part of the Johnson Controls Manufacturing System that resulted in a threefold increase in identified energy savings projects; and (2) the Better Plants Goal Achievement Award for achieving its 25 percent energy intensity reduction goal across its U.S. industrial facilities, three years ahead of schedule, with a 26 percent reduction by end of 2016. Johnson Controls has implemented its Energy Hunt program across its U.S. manufacturing locations, including plants in Delaware, Illinois, Kansas, Oklahoma and Oregon.

Illinois Tool Works (ITW), one of the world's leading diversified manufacturers of specialized industrial equipment, consumables and related service businesses, is taking steps to phase out the refrigerants containing high global warming potential (GWP) in the commercial kitchen appliances it manufactures. ITW began its equipment transition early and is ahead of schedule to meet EPA compliance dates, by either using refrigerant alternatives with a lower GWP value or developing products using "natural" refrigerants like propane that have no GWP impact if emitted into the atmosphere.

Schneider Electric, a leader in process efficiency and automation, is driving emissions savings at fifteen of its own U.S. plants, from Smyrna, Tennessee to its headquarters in Massachusetts, reducing the equivalent of 5,788 tons of carbon in 2016.[9] Schneider Electric has a sustainability objective of becoming carbon neutral by 2030. The company developed an Internet-of-Things, cloud-enabled platform called EcoStruxure to make buildings, power

[9] https://www.energy.gov/sites/prod/files/2017/05/f34/Schneider_Electric_EWA_Case_Study_5-12-17.pdf.

plants, and facilities smarter, improve processes, and save on down time, energy and water costs—a technology solution the company believes will be a useful compliance tool for power plant GHG policies. Schneider Electric recently helped implement enterprise-wide energy management solutions in 43 of Ford Motor Company's U.S. locations, leading to 40 percent energy efficiency savings.

Part Three: Barriers to Innovation and Progress in Reducing Emissions

The stories above, and the hundreds like them across the manufacturing sector, are impressive. However, there remain barriers to accomplishing even more. New Source Review, EPA policy on MACT standards, continuity problems for federal support programs and trade policy all present challenges that prevent manufacturers from making even deeper emissions reductions.

New Source Review

The New Source Review (NSR) program is a federal air permitting program under the Clean Air Act that applies to new facilities or major modifications to facilities. The purpose of NSR, according to the EPA, is to require industrial facilities "to install modern pollution control equipment when they are built or when making a change that increases emissions significantly."[10] In practice, however, NSR often stands in the way of efficiency upgrades and the installation of modern pollution control equipment.

[10] https://www.epa.gov/sites/production/files/2015-12/documents/nsrbasicsfactsheet103106.pdf.

For instance, if a manufacturer installs selective catalytic reduction technology to reduce NOx emissions, the component will trigger NSR for the entire source, requiring review of *all* emissions. Practically speaking, that means the manufacturer will need 12 to 18 months to obtain NSR permits, tying up investment capital and delaying the economic benefits from expansion projects. The program requires expensive air modeling that frequently delays projects and can cost $100,000 or more to complete. It can lead to citizen suits—not just during NSR but again during renewal of the facility's Title V operating permit—and enforcement actions. And that is assuming the manufacturer actually gets the permit.

EPA rules on netting of emissions under NSR unnecessarily delay, and sometimes prevent, manufacturers from replacing older fossil fuel boilers with newer, environmentally beneficial units. In addition, the EPA has required manufacturers to go through NSR when they replace relatively minor equipment (like a water pump) with a newer model, taking the position that only replacement with the original, inefficient, outdated part qualifies as "routine maintenance" that could avoid onerous permitting regulations.

The desire to avoid NSR can therefore create several perverse incentives: (1) an incentive for manufacturers to operate their plants exactly as they were built and only to replace parts with the exact same part that existed when the plant was built; and (2) an incentive to keep a plant's overall emissions high in order to "save" them for use in a future project. One manufacturer reports that customers have asked it to de-optimize performance in a suite of efficiency

upgrades in order to avoid triggering NSR. Any rule that results in companies affirmatively taking steps *not* to optimize efficiency puts those companies at a competitive disadvantage.

An NAM member company manufactures gas turbine upgrade technology that could improve the vast majority of in-service gas turbines by 2.6 percent and reduce their total CO_2 emissions per MWh by 6.5 percent; however, many manufacturers are choosing not to install this equipment simply because it triggers NSR. The same can be said for steam turbine upgrades, which would ensure higher grid efficiency, lower emissions and reduced wear and tear that is occurring from a rapidly changing electric grid.

NSR also presents a huge impediment to the installation of more efficient technologies that would ultimately combat climate change. An inability to define what is "routine maintenance" has resulted in NSR Notices of Violation being issued for environmentally beneficial projects like economizer replacement, steam turbine upgrades, feed water heater replacements and similar activities. In comments to the EPA's draft Clean Power Plan, the Utility Air Regulatory Group (UARG) cited *more than 400 instances* in which a regulated entity took on a project to improve the energy efficiency of a power generation unit, only to be targeted by the EPA or citizen suits alleging that it had violated NSR.[11]

This cannot possibly be what Congress intended. In response to recent stakeholder outreach by the Department of Commerce and the EPA on

[11] Comments of the Utility Air Regulatory Group on Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units, Docket ID EPA-HQ-OAR-2013-0602-22768, Attachment A (Dec. 1, 2014).

regulatory impediments to manufacturing, commenters from aerospace, insulation, pulp and paper, hard rock mining, iron and steel, clean energy power generation, boiler manufacturing and many other sectors raised NSR as a serious regulatory impediment. The NAM urges this committee to work with the EPA to fix NSR so that it functions properly and does not stand in the way of efficiency upgrades or environmentally beneficial projects.

Maximum Available Control Technology (MACT) Once-In-Always-In Policy

The EPA's existing policy is that once a manufacturer is subject to a MACT standard, it will *always* be subject to that MACT standard and the regulatory obligations that go along with it—even if the manufacturer installs pollution control technologies that reduce its emissions below the threshold levels that originally triggered MACT applicability to begin with. Practically speaking, this means once a manufacturers' emissions are below the MACT-required limits, there are very few regulatory reasons why the manufacturer would drive them even lower.

Ups and Downs of Federal Programs and Partnerships

While a competitive market is generally the best way to encourage the development of transformational technologies, the reality is that both the public and private sectors have roles to play. For instance, the government can play a positive role in support of the research and development (R&D) of alternative energy sources or technologies at a pre-commercial stage. There is also an

important federal role to be played in basic R&D of new high-risk energy efficiency and waste minimization technologies in energy-intensive industries, particularly where private-sector incentives may be inadequate.

Over the past 15 years, Congress has repeatedly enacted and enhanced programs that provide assistance to manufacturers in modernizing their plants and the products they make in them. These programs, with names like ARPA-E, ATVM, DERA, Energy Star, Better Buildings and Better Plants, are all regularly used by manufacturers and contribute to many of the innovations described above. Scores of manufacturers participate in programs such as the EPA's Climate Leaders Program, the DOE's Better Buildings, Better Plants Challenge and the Clean Energy Manufacturing Initiative, and with the help of these programs, these companies have not only met but exceeded their emissions goals. Continuity challenges for these programs, which often become subjects of Congressional scrutiny, can stand in the way of long-term progress for the manufacturers that rely on them.

Environmental Goods Agreement

The world's most pressing environmental problems do not exist solely within our own borders. There is a trillion-dollar market for environmental goods, and manufacturers in the United States make some of the best pollution control technologies on the planet. Unfortunately, many of our trading partners charge tariffs as high as 50 percent on these goods. The NAM has been a longtime supporter of efforts by the U.S. Trade Representative to negotiate an

Environmental Goods Agreement (EGA). A properly structured EGA would create jobs for U.S. manufacturers, who could then sell their best-in-class pollution control technologies to the rest of the world.

In the EGA talks, the United States, China and 15 other World Trade Organization members are considering a list of more than 350 environmental products that the NAM hopes will form the basis for an ambitious agreement. In particular, NAM members are seeking an EGA that eliminates tariffs on products including air pollution equipment, catalytic incinerators, energy-efficiency materials, environmental monitoring equipment, renewable energy products and equipment, turbines for electrical power generation and water treatment equipment.

The benefits of a robust EGA to manufacturers in the United States are crystal clear: it will boost U.S. manufacturing and our broad environmental goals as a country, supporting jobs and growth throughout the supply chain. It will also be an important catalyst to increased trade and innovation in technologies that will improve the environment, from providing cleaner water to reducing pollution, and support the growth of the manufacturing industries that produce these technologies. In the United States, such technologies are manufactured throughout the country, providing well-paying jobs.

Conclusion

Manufacturers have established a strong record of environmental protection and strive to reduce the environmental footprint of our operations and

to become more sustainable. The results are already impressive, and they get better with each passing year. However, as my testimony shows, barriers still exist. The NAM hopes it can work with this committee to reduce these barriers and help solve the environmental challenges of current and future generations.

Senate Environment and Public Works Committee
Hearing entitled, *"Promoting American Leadership in Reducing Air Emissions Through Innovation"*
November 15, 2017
Questions for the Record for Ross Eisenberg

Chairman Barrasso:

1. Mr. Eisenberg, at the hearing, you said that it is time to modernize the Clean Air Act. How do we build trust in Congress that changes to the Clean Air Act could actually result in net environmental gains and emissions reductions? In addition to the provisions governing New Source Review, are there other parts of the Clean Air Act that need to be significantly amended due to implementation challenges or that are simply outdated?

Answer:

As my testimony demonstrated, our environmental indicators are steadily improving. However, they are coming at an ever-increasing cost. Federal environmental regulations—many based on statutes that are decades old—are increasingly rigid, costly and harm our global competitiveness. Several recent regulations threaten to set new records for compliance costs, collectively strapping manufacturers with hundreds of billions of dollars in new regulatory burdens per year. We have lost the critical balance in our federal environmental policies between furthering progress and limiting unnecessary economic impacts. The state of our national economy, the manufacturing sector and the environment are considerably different than they were 20, 30 or 40 years ago. However, we are still operating with policies designed to address the environmental challenges of a previous era. Manufacturers believe it is time to modernize our environmental policies to better reflect and address current issues, technologies and opportunities to ensure a more sustainable future.

The NAM recommends that Congress modernize outdated environmental laws written in the 1960s and 1970s and make them perform better, or require federal agencies to regulate environmental challenges better— or both. As you and Ranking Member Carper both recognized at the hearing, there is a significant amount of trust that needs to be rebuilt in order to accomplish this goal.

I believe the answer to this problem lies, at least in part, in data and transparency. One of the main reasons I used the first ten pages of my testimony to reconstruct the emissions data for manufacturing on a pollutant-by-pollutant basis is to provide an unbiased view of the data for the Committee. I had to construct each of these charts myself because they were not otherwise available on a public forum. I encourage the Committee and the EPA to commit to providing a steady stream of data, both on emissions trends and compliance, to help determine which programs are working and which programs need improvement. You cannot build a case for change unless you have the best available facts to support your position.

Congress should work with the Environmental Protection Agency to audit key programs under the Clean Air Act like NSR, NAAQS, Title V and NESHAPs. The goal should be to mine

the data and determine if the issues that have been raised are in fact borne out by the data. Congress should also empower the EPA to identify areas the Agency and/or states may not have the best data. For instance, some air permitting programs are done by hand and are not available online.

In addition to NSR, I believe the Committee should examine the NAAQS, NSPS and HAP programs. Not all situations will merit action. However, I do believe there are improvements available to programs like the NAAQS, which have been so successful that many pollutants are approaching background levels and the bulk of the compliance technologies have already been invented. The past two ozone NAAQS revisions have encountered the bizarre situation where even EPA admits that a large portion of the technologies needed for compliance do not exist.

The NAM specifically recommends the following:

- Modify the National Ambient Air Quality Standards (NAAQS) review cycle to more closely align with the pace of implementation of existing standards and consider cost and technological feasibility when conducting NAAQS policy assessments and during implementation.
- Require the Clean Air Scientific Advisory Committee (CASAC) to comply with Section 109(d) of the Clean Air Act and "advise the Administrator of any adverse public health, welfare, social, economic, or energy effects which may result from various strategies for attainment and maintenance" of NAAQS.
- Amend Clean Air Act Section 179B to more clearly provide relief for states that cannot meet federal air quality standards due to contributions from emissions from outside the United States.
- Provide flexibility to NAAQS nonattainment areas so that offset requirements are tied to reasonable and available reduction opportunities, with consideration to reasonable cost thresholds.
- Simplify the New Source Performance Standards (NSPS) process to provide certainty for manufacturers that they are in compliance with the law. NSPS should be set using criteria that ensure optimal cost effectiveness and do not hinder economic growth. EPA should also allow adequate timing to demonstrate compliance once an NSPS is triggered.
- Base any Hazardous Air Pollutant (HAP) regulations on sound scientific data that clearly demonstrate a need to protect public health and consideration of welfare, energy and economic impacts. The EPA's inability to meet arbitrary deadlines should not trigger automatic regulation.

2. In your written testimony, you mention the "once-in-always-in" policy under the Section 112 program of the Clean Air Act. Can you explain how the current "once-in-always-in" policy works in more detail, and why it discourages emissions reductions at facilities? How would you recommend fixing the problem?

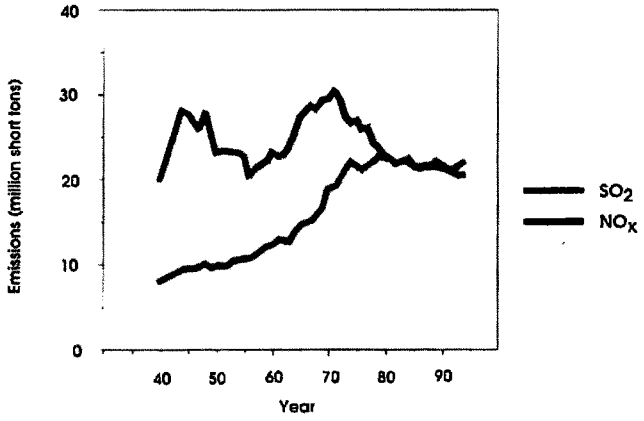
Answer:

"Once-in-Always-In" refers to a policy established by EPA that once a source emits enough above the threshold to become a "major source" subject to a MACT standard, it is *always* subject to the regulatory obligations that accompany a major source, even if it reduces its emissions below the threshold that triggered MACT major source applicability. This is a policy interpretation by EPA and is not mandated by the statute. EPA issued a proposal to eliminate the policy in the mid-2000s, but the policy was never finalized.

MACT requirements are often the most stringent in the Clean Air Act. If a major source is always a major source simply because it was once a major source, then manufacturers face the same regulatory burden regardless of whether they reduce emissions to the major source threshold or to a level substantially below the threshold. Manufacturers will continue to reduce their emissions because it is the right thing to do. That said, NAM believes if EPA were to abandon the once-in-always-in policy and instead allow facilities the benefit of being considered a minor source if they reduce emissions below the major source threshold, we could see even greater reductions of hazardous air pollutants.

Senator Whitehouse:

Emissions of nitrogen oxide (NOx), the primary precursors of ozone pollution, and other air pollutants were rising significantly before 1970, according to government data reproduced below from the U.S. Forest Service website.[1]



3. In your written testimony, you observe that emissions of NOx and other air pollutants have significantly declined since 1970. You don't mention that the Clean Air Act was amended in 1970 to provide for much greater federal authority to control air pollutants. Do you acknowledge that the Clean Air Act and the regulatory framework bear some responsibility for the decline in NOx emissions?

4. The National Association of Manufacturers (NAM) lobbied against strengthening the Clean Air Act in 1970 and 1990. NAM warned that strengthening the laws and regulations to more stringently limit air pollutant emissions would have hurt industry. The American economy has expanded by more than 350 percent since the 1970 amendment to the Clean Air Act and by almost 200 percent since the 1990 amendment to the Clean Air Act. Would you now concede that NAM's warnings overstated the risk to the economy by more aggressive federal clean air regulation? If not, please cite recent peer reviewed research that supports the position NAM previously took.

5. Can federal clean air laws and regulation act as an incentive for innovation?

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[1] *Acid Rain*, National Forest Service, available at https://www.fs.fed.us/foresthealth/fhm/pubs/fhncs/chapter3/acid_rain.htm

6. Do you consider the catalytic converter to be an innovation? In your opinion, would the automobile industry have developed and installed catalytic converters on cars had it not been required by law to do so?

7. With respect to sulfur dioxide (SO2) emissions, the primary cause of acid rain, and referring again to the graph included in my first question, do you acknowledge that the Clean Air Acts amendment of 1970 bear some responsibility for the decline in SO2 emissions?

8. As recently as the late 1980s, NAM opposed amending the Clean Air Act to require further reductions in SO2 emissions, and even challenged the science linking SO2 emissions to acid rain, writing, "The present state of knowledge on the causes and effects of acid rain is, at best, ambiguous… There is time for science to guide the public policy debate."[2] Would you now concede that NAM's position in the 1980s about the causes and effects of acid rain were incorrect? If not, please cite any recent peer reviewed research that supports the position NAM took.

9. In your written testimony, you attribute the reduction in industrial SO2 emissions to "technologies that allowed [manufacturers] to burn energy with less emissions as well as technologies that reduced the SO2 emissions in the manufacturing process." Do you consider these technologies to be innovations?

10. In your opinion, would industry have voluntarily developed and installed such technologies had it not been required by law to reduce its SO2 emissions?

11. Turning to coarse (PM10) and fine (PM2.5) particulates, do you acknowledge that the 1970 Clean Air Act amendment bears some responsibility for reductions in PM10 and the 1990 Clean Air Act amendment bears some responsibility for reductions in PM2.5?

12. NAM opposed regulations implementing the 1990 Clean Air Act amendment that required the reduction of particulates and other emissions, stating in 1996 that the regulations would have "a chilling effect on economic growth."[3] Would you now concede that NAM's position on the regulation of particulates was overstated? If not, please cite any peer reviewed research that supports the position NAM took.

13. Given the fact that NAM's historical claims that clean air laws and regulations would harm the American economy have not been borne out by actual economic data, why should policy makers believe any of NAM's current similar claims relating to ozone

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[2] *Dirty Industry Claims about Science: We've Heard These Falsehoods Before*, National Resources Defense Council, available at http://www.ardeacionfund.org/updates/dirty-industry-claims-about-climate-we-ve-heard-these-falsehoods-before.html/

[3] *EPA Tightens Rules on Dirty Air*, Deseret News, available at https://www.deseretnews.com/article/527384/EPA-TIGHTENS-RULES-ON-DIRTY-AIR.html

National Ambient Air Quality Standards (NAAQS), the Clean Power Plan (CPP), and Corporate Average Fuel Economy (CAFE) standards?

Answer:

Thank you for your questions. The NAM is committed to protecting the environment and to environmental sustainability, and fully supports the ongoing national effort to protect our environment and improve public health through appropriate laws and regulations. American industry has established a strong record in environmental protection: as the foundation of communities, manufacturers have made substantial investments over time to minimize their environmental footprint, and continue to do so today. This commitment to innovation will ensure further progress.

Attached is a copy of the NAM's most recent board-approved policy positions pertaining to energy and the environment. I would be more than happy to discuss them with you or your staff at your convenience.

Thank you for the opportunity to testify before the Environment and Public Works Committee. I look forward to continuing our shared effort to protect the environment.

procedures. The NAM supports full implementation of those public participation provisions. Agencies should notify the public and request comment on all regulatory, guidance and research actions at the earliest feasible stage. Public comment periods should be consistent with the complexity of the document and the amount of time the agency needed to prepare it. Public comment and agency responses to comments should be included in an online public record. To enhance participation by stakeholders, government documents should be written in plain, understandable language.

3.05. Freedom of Information

The NAM recognizes and supports the public's right of access to certain types of information maintained by government. The submitters of confidential information provided to government have a corresponding right to expect that the confidentiality of such information shall be preserved. The NAM is especially concerned about the resultant harm to industry when disclosure is indiscriminate and fails to take into account the sensitive and confidential nature of business information. The NAM further believes that any statute providing access to government-held information must reflect a clear balance between the right of access and the right to confidentiality. A mechanism to safeguard confidential business information is essential if this balance is to be achieved. At the same time, public access to government information that is publicly releasable through the Freedom of Information Act should be as efficient and streamlined as possible.

3.06. Information Quality

Agencies should effectively implement the Information Quality Act, including having transparent, established systems for ensuring that information disseminated by an agency is of high quality and for dealing fairly and expeditiously with petitions for correction of such information. An unbiased peer review of scientific and technical information should be an integral part of the regulatory process. Pre-dissemination review of information is just as critical as a robust petition process. Under the petition process, denial of a request for correction in whole or in part is final agency action under the Administrative Procedure Act and subject to judicial review.

ERP-01 Energy and Natural Resources

Energy and natural resources are the life blood of manufacturing. Manufacturers need adequate, secure, reliable and affordable energy and raw materials to compete in the global marketplace. Luckily, the United States has a mix of energy resources and innovative technologies unmatched by any other nation in the world. The United States has abundant supplies of coal, natural gas and oil; our fleet of nuclear power plants cleanly and efficiently produce a substantial portion of the nation's electricity; renewable sources are growing quickly and diversifying the nation's energy portfolio; and advances in energy efficiency continue to cut manufacturers' energy costs.

The NAM therefore supports an "all-of-the-above" approach to energy. This strategy promotes the responsible development and use of all energy sources, including fossil fuels, nuclear, renewables and alternatives and recognizes the importance of energy efficiency to meeting future energy demands. Government policies affecting energy, including those pertaining to the electric grid, must place a priority on reliability and must preserve manufacturers' global competitiveness. The NAM supports significant investments to modernize the national utility grid

and utilize advanced metering infrastructure, distributed energy resources and other advanced technologies to improve efficiency, affordability, reliability and security.

The NAM and our member companies are committed to addressing global climate change while preserving competitiveness as set forth in Section 1.09 below.
Government should not be in the business of picking winners and losers in the energy space, and must not impede or impair the ability of energy-producing and energy-consuming segments of industry to obtain adequate funding for energy-related investments. The NAM will identify and oppose overly restrictive regulations and the implementation of policies that limit or eliminate energy sources and production.

1.01. Oil and Natural Gas
There are abundant oil and natural gas resources in the United States, and domestic demand for these resources continues to increase. For manufacturers, the nation's domestic oil and natural gas supply is an important component of our energy future. Moreover, a reliable balance between supply and demand is important to assure competitive, stable prices. In today's global economy, U.S. manufacturers must be assured of an adequate supply of competitively priced oil and natural gas for industrial and commercial use, such as petrochemical feed-stocks, process gas uses and transportation fuels, and for power and steam generation.

1.01a. Production
The NAM supports policies that promote the leasing, exploration and development of the nation's oil and natural gas resources in an environmentally sound manner. Exploration and development of promising areas onshore, offshore and in the Arctic can substantially lower our nation's energy vulnerability. Continued attention to complying with safety standards will help ensure minimal safety, environmental and health impact. New technologies such as hydraulic fracturing and horizontal drilling have made the extraction of unconventional resources, such as shale gas and shale oil, technically feasible and cost-effective. Continued development of these resources, as well as other North American resources like the Canadian oil sands, can provide a steady stream of secure, competitively-priced energy for American manufacturers and consumers. A commitment to developing the nation's bounty of onshore and offshore sources of gas and oil will have a significant positive impact on this country's ability to meet its feedstock and energy needs. As is currently the case for states with onshore production from federal lands, and for Gulf Coast states with production from federal waters off their coasts, all states with federal offshore leasing and production should share in related federal revenues.

1.01b. Refining
The refining industry is one of America's largest manufacturing sectors, and refined petroleum products play a critical role in meeting domestic transportation fuel demands. U.S. refineries process crude oil into products such as gasoline, distillate and jet fuels, heating oil and chemicals for domestic use and for export into world markets. U.S. refiners have responded to the call for a cleaner environment by producing cleaner fuels, such as reformulated gasoline, at competitive prices. Uninterrupted production of these products and the transportation infrastructure necessary to deliver them are essential to our national energy and economic security as well as to U.S. industry's ability to compete globally.

1.01c. Natural Gas, Manufacturing and Liquefied Natural Gas (LNG) Exports
Industry relies on natural gas for much of its energy needs and as a raw material. The NAM believes policies that encourage the cost-effective use of natural gas to grow American manufacturing should be encouraged. The U.S. economy relies on natural gas for its energy

needs and as a feedstock for commercial products. Natural gas is and will remain an important manufacturing commodity because of its scalability, affordability, versatility and efficiency. The NAM supports policies at the federal and state level that facilitate the responsible and expeditious development of natural gas resources, allowing these benefits to contribute to America's economic recovery and to accrue for energy consumers.

The dramatic increase in the domestic natural gas resource base and accompanying natural gas production has substantially reduced net imports of natural gas, paving the way for the U.S. to become a net exporter of natural gas. An adequate supply of natural gas is needed to meet the growing demand of the U.S. manufacturing sector, and will be enabled by access to abundant domestic resources as well as increased access to global energy markets. The NAM strongly supports federal and state policies to accommodate growth in domestic natural gas production. We further believe abundant domestic natural gas resources can fuel a renaissance in U.S. manufacturing. The NAM fundamentally supports free trade and open markets as set forth in IEAP-01. We support a natural gas policy process that is open, transparent and objective.

1.02. Coal

Coal is an abundant energy resource in the United States, a significant and important export commodity, and a vital part of our efforts to meet our energy and transportation needs. The NAM believes increasing the utilization of advanced clean coal utility and industrial generation technology as well as expanding coal-to-gas and coal-to-liquid technologies in an environmentally sound manner is an appropriate and desirable national policy. Coal generates a significant percentage of our nation's electricity, and maintaining coal in a diverse national energy portfolio is in the national economic interest.

Government actions that unreasonably increase the cost of production and use of coal for limited environmental or health benefits are counterproductive. Unbalanced laws and regulations governing air, water and solid waste are currently the most crucial restraint on coal production and the use of coal by industry and utilities. Environmental policies should be reviewed and applied in a manner that balances reasonable environmental objectives with the need to have a diverse fuel portfolio, including continued cost-effective coal use.

1.03. Renewable, Alternative and Low-Carbon Energy Sources and Solutions

Low-carbon, renewable and alternative energy resources such as wind, solar, geothermal, hydrogen fuel cells, hydropower, landfill gas, municipal solid waste (excluding paper which is commonly recycled) and sustainable biomass provide potential alternatives to traditional fossil fuels. Together these resources account for a steadily rising share of U.S. energy supply and development. A competitive market energy policy is the best way of encouraging economically sustainable alternative energy options. Government can play a positive role in support of the research and development of alternative energy sources or technologies at a pre-commercial stage. The NAM supports policies that encourage an energy mix including clean, renewable and low carbon energy resources and other power solutions and promote energy efficiency measures. Conversely, the NAM opposes federal government mandates for increasing the use of any energy source at the expense of any other. Significant grid improvements are needed and encouraged to ensure manufacturers have secure, flexible and competitive energy options. As the nation's energy mix expands and diversifies, government policies must place a priority on energy reliability.

Care must be taken to avoid potential adverse impacts on users of renewable feed stocks, agricultural and forest resources. Incentives should not create winners and losers in a quest for developing renewable fuels. In establishing federal renewable energy policies, the NAM encourages Congress to provide transparent assessments of costs and benefits, prioritize energy reliability, recognize regional differences in renewable energy resource availability, and not conflict with or pre-empt state programs already enacted, including well-constructed state renewable portfolio standards where they exist. Research and development efforts should be pursued related to potential utilization of non-traditional fuels and technologies as a means to enhance energy flexibility and expand diversification of energy supplies over time.

1.03a Combined Heat and Power

Consistent with U.S. manufacturers' demonstrated history of innovation, the NAM supports polices to encourage investment in combined heat and power (CHP) systems. When economical, CHP systems allow end users to realize energy savings greater than upfront investment and ongoing operation and maintenance costs and can reduce emissions. Policymakers should remove any remaining barriers that impede deployment of such energy efficient technologies. Working with all stakeholders, federal policymakers should consider model best-practices for states to address regulatory barriers to CHP deployment, including guidance for assigning reasonable fees and rates for interconnection to the local distribution grid, supplementary power, backup or standby power, maintenance, and interruptible power supplied to facilities that operate CHP systems that also allow for reasonable cost recovery by an electric utility based on the costs to provide these services and do not shift costs to non-CHP customers.

1.04. Energy Delivery Infrastructure

The NAM supports continued improvements to laws and regulations that result in a transparent, streamlined and timely federal regulatory process for the siting and permitting of all energy delivery infrastructure, including oil and natural gas pipelines, energy transport by rail, and interstate electric transmission infrastructure. Cost-effective investments in transmission infrastructure to improve the reliability, capacity, efficiency and security of the electric grid promote a competitive wholesale electricity market which benefits residential, commercial and industrial rate-payers. Transparent assessment of the full cost of intermittent technologies, which require additional investments to maintain grid reliability and efficiency, should be recognized in cost/benefit analyses.

1.05. Demand-Side Management (DSM) Programs, Energy Efficiency Measures and Distributed Energy Resources

The NAM believes that the provision of cost-effective DSM services by customer and aggregator programs, energy efficiency measures, and distributed energy resources can help ensure a reliable and adequate electricity supply at a lesser cost. Investments in and opportunities for technologies and measures that enable customers and aggregators to provide such services should not be precluded. The NAM also believes that electric and natural gas utilities should not be precluded from meeting future electricity and natural gas needs with these technologies and measures. Utilities also must not be precluded from recovering prudently incurred costs when implementing these programs, measures and services, and non-discriminatory market opportunities for DSM services and distributed energy resources. Unreasonable barriers to customer choice of power generation and efficiency improvements, including distributed generation, should be minimized. The NAM encourages cost-effective

information exchanges that support demand-side management through data exchange between utilities and customers.

1.06. Hydroelectric Power
Hydropower is a renewable resource that has demonstrated capability to provide affordable electricity in areas where nature provides such opportunities, and effectively complements the nation's other fuel resources to meet U.S. energy needs. Although hydro contributes a relatively small percentage of the nation's energy supply, it is a significant percentage of the renewable energy supply. It is energy efficient, with energy conversion efficiency in the range of 85-95 percent. The NAM supports the continued use and development of hydropower resources.

The NAM supports the streamlining of the regulatory process for hydroelectric power development through the elimination of redundant or contradictory regulatory steps and avoiding the imposition of conflicting clauses in other legislative initiatives such as those related to clean air, clean water and endangered species.

With regard to hydro projects owned and operated by the federal government itself, efforts to offset their impact on fish and wildlife (including Endangered Species Act initiatives) must be carefully balanced with the preservation of economic, recreational and public safety goals.

1.07. Nuclear Energy
Nuclear power is a safe and vital source of cost-effective base-load electricity that does not emit criteria pollutants or greenhouse gases into the atmosphere. It is the largest source of non-emitting power generation in the United States and a major source of electricity for manufacturers. The NAM supports the continued development and operation of nuclear energy consistent with the protection of public health and safety.

Nuclear energy helps ensure reliable and affordable electricity as part of a diversity of fuel sources. As the demand for electricity in the U.S. continues to grow, the NAM supports the construction of additional nuclear power plants that have been approved by the Nuclear Regulatory Commission to maintain a diverse portfolio of generating resources. The NAM also supports advanced nuclear technology for use in manufacturing as a source of carbon-free process heat.

In supporting the continued use and development of nuclear energy in the United States, the NAM supports the construction and operation of facilities covering all parts of the fuel cycle and nuclear energy generation, including power plants, fuel enrichment facilities, fuel fabrication plants, low-level and high-level waste handling and disposal operations, and other related facilities critical to supporting and expanding the nuclear energy industry.

The NAM supports policies that move the federal government to fulfill its legal obligation to remove used fuel from commercial nuclear power plants and manage its long term disposal. We support the research, development and demonstration of technologies to close the fuel cycle while a permanent disposal facility, which is needed even if the fuel cycle is successfully closed, is developed. The NAM encourages the development of interim storage facilities for consolidating used fuel until recycling or permanent disposal facilities, or both, are available.

1.08. Energy Efficiency
Manufacturers, including generators and users of energy, are committed to reducing our energy intensity and producing more energy efficient consumer products to help reduce the demand for energy, save money, lower costs and lessen greenhouse gas emissions. American society has

much to gain from sensible efficiency and waste reduction measures across all sectors of the economy. Manufacturers, including generators and users of energy, continue to seek improvements to the New Source Review (NSR) process to reduce barriers to installation of energy efficient technologies.

1.08a. Industrial Energy Efficiency

Manufacturers use one-third of our nation's energy and are directly affected by the cost of energy in making products as well as by the cost of maintaining office operations. It is widely acknowledged that process and building system energy efficiency and conservation offer immediate and cost-effective opportunities to reduce energy cost inputs, reduce water use, stretch available energy supplies and decrease greenhouse gas emissions.
Manufacturers have taken the lead in making energy efficiency a priority. Improvements in energy efficiency in the manufacturing sector have helped the country to be more efficient in energy use per unit of GDP and reduced the energy intensity of the U.S. economy. Manufacturers have achieved greater energy efficiency through cost-effective distributed generation, combined heat and power technologies, waste heat recovery systems, water reuse and recycling, high efficiency motor-driven systems, intelligent energy systems such as advanced metering infrastructure and demand response, and improved process manufacturing.

The most significant federal actions to increase industrial energy efficiency in the long run are those that will create a positive, reliable and unbiased climate for capital investment financing tools and other energy services agreements for new and existing plants, buildings and equipment across all sectors.

There is an important federal role to be played in basic research and development of new high-risk energy efficiency and waste minimization technologies in energy intensive industries, particularly where private sector incentives may be inadequate. Federal policies should provide a reliable investment environment for businesses of all kinds and sizes to pursue proven energy management technologies, practices and services.

The NAM believes that previous overly prescriptive federal energy policies have failed in large part because cost-effective industrial energy efficiency improvements are best left to individual businesses and the competitive marketplace. Industrial energy management is a complex moving target that includes process innovation, long-term quality planning, energy assessments of building and equipment purchases, linkage of water and energy efforts, employee awareness, and waste minimization and recovery.

The NAM supports voluntary industry and market-driven benchmarking of industrial facilities and processes for the purposes of raising the level of awareness of best-in-class energy management possibilities. The NAM opposes the undue imposition of mandatory data collection programs. The federal role should be limited to supporting industry in the development of voluntary information exchanges.

The NAM also opposes the imposition of mandatory industrial energy efficiency targets. Federal energy efficiency targets would have no meaning to most companies because manufacturing energy consumption varies dramatically from plant to plant. Product demand, weather, water availability, fuel price swings and capital investments, such as pollution control technology, influence manufacturing energy consumption.

The NAM supports federal programs that encourage and help manufacturers, especially small and medium-sized manufacturers, to understand and deploy energy efficiency and energy management measures for the purposes of becoming more competitive in a global marketplace.

1.08b. Building Sector Energy Efficiency

Manufacturers play a significant role in improving the efficiency of commercial and residential buildings. Since the building sector consumes approximately 40 percent of all energy used in the United States, the NAM supports market, regulatory and institutional reforms that increase opportunities to better utilize advanced technology and energy management practices to boost energy efficiency in buildings.

The NAM supports policies to enhance private sector investment in public building efficiency improvement projects, as well as policies that strengthen standards for existing commercial, industrial and residential buildings. These policies will:

- Promote consumer transparency through energy use labeling for buildings;
- Improve the existing national database of energy consumption information;
- Encourage open and visible access to energy usage and pricing;
- Partner with the private sector to support research, development and deployment of energy efficient technologies;
- Save taxpayers money by reducing government energy spending;
- Recognize and value energy efficiency investments; and
- Provide an incentive for states to update building codes.

Finally, the role of cooperative government-industry initiatives will be crucial in developing innovations that transform current construction and retrofit methods into an approach that fully integrates energy efficiency. Hand-in-hand with this is the development of techniques to maintain efficiency through the lifespan of buildings, including energy audit systems and techniques and best practice-sharing of both.

1.09. Climate Change

The NAM and our member companies are committed to protecting the environment through greater environmental sustainability, increased energy efficiency and conservation and reducing greenhouse gas emissions. We know the U.S. cannot solve the climate change issue alone. The establishment of federal climate change policies to reduce greenhouse gas emissions, whether legislative or regulatory, must be done in a thoughtful, deliberative and transparent process that ensures a competitive level playing field for U.S. companies in the global marketplace.

Therefore, any federal or state government policies must protect the international competitiveness of the U.S. marketplace economy. Any climate change policies should focus on cost-effective reductions, be implemented in concert with all major emitting nations recognizing the need for leadership by the U.S., and take into account all greenhouse sources and sinks. The NAM believes that federal climate policies generally should pre-empt state policies.

1.09a. Carbon Capture (CCUS)

The NAM supports continuing research, development and demonstration of carbon capture, beneficial use and storage (CCUS) technology as a means to facilitate expansion of the

domestic recoverable oil and insure continued availability for energy conversion of the abundant oil, gas, and coal on federal lands. Any carbon dioxide (CO_2) injection must not be classified as hazardous and permitting for injection must be streamlined and delegated to the states where the federal lands are located.

1.10. Natural Resources

U.S. manufacturers require access to natural resources, such as rare earth elements and other critical materials, in order to produce products that are vital to the U.S. economy. Moreover, these resources are essential for the U.S. to remain competitive in the global manufacturing economy. Competition for raw materials should be market-based and not distorted by unwarranted or biased government action. The NAM supports government policies and actions that allow manufacturers access to these vital resources, support R&D, encourage the mining and processing of such resources, and support unimpeded trade thereof.

1.11. Energy Production from Federal Lands

The NAM supports policies that facilitate the expeditious leasing, exploration and development of the nation's fossil energy resources in an environmentally compatible manner. These national resources on public lands are essential to our country's economic growth by insuring affordable and reliable energy for our homes and manufacturing facilities. The NAM opposes efforts to unnecessarily further restrict access to these national resources. The oil, gas, coal, oil shale, geothermal and uranium leasing programs, which have historically been inconsistent in their administration, have limited the potential to use a wide range of energy resources that lie beneath federal lands. A long-term, stable and reliable leasing policy must be maintained. The NAM therefore supports streamlining and expediting energy resource leasing and policies that limit royalties and fees to cost recovery for administration of the leasing programs.

ERP-02 Environmental Quality and Sustainability

The NAM is committed to protecting the environment and to environmental sustainability, and fully supports the ongoing national effort to protect our environment and improve public health through appropriate laws and regulations. American industry has established a strong record in environmental protection: as the foundation of communities, manufacturers have made substantial investments over time to minimize their environmental footprint, and continue to do so today. This commitment to innovation will ensure further progress toward reducing environmental impacts and increasing sustainability in operations.

A high standard of living depends upon a healthy environment, robust economic growth and an adequate and secure supply of energy at globally competitive prices. Quality of life encompasses complex economic and social considerations, including clean air and water, conservation of material and human resources, as well as continued economic development. Environmental laws and regulations should be designed with utmost care to ensure that they are effective in achieving their desired objectives while at the same time avoid unnecessary adverse economic and social impacts.

Accordingly, measures to protect environmental quality should:

- Address an identified need and be based on facts, credible science and least cost means of implementation;
- Be based on factual data, with due regard for their total impacts on employment, energy used, resources, land use and other regional, national and international social and economic concerns;
- Promote innovation and recognize that technological advances over time have generally reduced the environmental impacts of energy production and consumption;
- Recognize the technological advances made by manufacturers and allow for a proper balance between economic growth and the protection of our environment;
- Take into account all future challenges, such as those posed by climate change and a changing environment, as well as those posed by the limitations of existing technologies;
- Utilize sound science and appropriate risk management processes to better focus our national effort and resources on environmental problems that pose a truly significant risk;
- Employ rigorous economic analysis to better understand potential economic impacts and cost-benefit relationships;
- Include a careful review and evaluation of the compliance timeframes that manufacturers are given to meet new standards or regulations; and
- Integrate a complete cumulative analyses of regulations' impacts on regulated industries, manufacturers and the economy.

2.01. Principles for Sustainability
NAM member companies are committed to advancing sustainability efforts that positively impact manufacturing and industry's contributions to environmental protection, economic performance and the social well-being of the employees, communities, customers and consumers they serve. NAM members recognize these challenges and will respond by encouraging the adoption of sustainability best practices and application of life cycle analysis practices in the manufacturing sector. NAM members will work proactively with relevant stakeholders to ensure that the voice of manufacturing is heard and is contributing its positive story.

NAM members support the following principles for sustainability in manufacturing:

- Sound economic, social and environmental performance is an element of sustainable companies;
- Encouraging research, development and deployment of innovative, cost-effective technologies and operational improvements that will enhance sustainable manufacturing activities;
- Improving water efficiency;
- Minimizing natural resource impacts by increasing efficiencies and conservation to optimize raw material input and to reduce waste output;
- Continuing to improve the environmental, health and safety profile of manufacturing and its workforce by improving performance processes and products;
- Recognizing action taken by companies who are leaders in implementing voluntary sustainability practices and procedures;
- Managing land use and natural resources to provide economic benefit while protecting biodiversity;
- Collaborating and interacting with supply chain members to responsibly manage total environmental impacts; and
- Building sustainable practices to support, attract, develop and retain a highly skilled, diverse workforce.

2.02. Standards

Standards serve an important role by providing for consistency of approach and quality of outputs for society. Standards should not be narrowly based on a single environmental medium, but should take into consideration cross-media impacts that may occur when a standard results in the mere transfer of a pollutant from one medium form to another. Standards should reflect the fundamental difference between corrective programs, which involve retrofitting of existing facilities, and preventive programs, which involve the construction of new facilities and manufacture of new products. In those instances when standards are technology-based, each standard must be technically proven, achievable and cost effective. Once technology has been installed in compliance with current regulations, the installer should not be arbitrarily subjected to changed regulations for a reasonable period of time, taking into consideration the useful life of the equipment.

2.03. Hazard Identification, Risk Assessment and Risk Management

The ability to systematically and effectively identify hazards, assess risks and manage those risks is critical to successful industrial activity. Those processes include the application of scientifically sound hazard identification and prioritization, objective, credible risk assessment, benefit-cost analysis, flexible, efficient and cost-effective risk management, and adequate opportunity for meaningful public participation in the risk assessment process.

Governments need to recognize the costs for environmental protection compete in a society with finite resources to address diverse worthy goals. Environmental laws and regulations should be based on scientific criteria resulting in cost-effective measures that provide significant environmental or human health benefit.

2.04. Compliance and Enforcement

NAM recognizes that enforcement is a critical component of any environmental protection program. Great advances in environmental protection have resulted from practical, cooperative programs between regulated entities and regulatory agencies. As environmental problems

require more technically complicated solutions and the global business environment becomes more competitive, greater emphasis should be given to such cooperative approaches and to providing compliance guidance before violations occur. The consequences of non-compliance should be proportionate to the violation and the consequences should drive compliance and prohibit recurrence of violations. Further, enforcement actions should not be used by regulators to extract improvement and investments in excess of regulatory requirements and permit conditions.

The government should continue to develop and implement methodologies to measure compliance with environmental regulations and associated environmental improvements. Decreased violations should be viewed in light of improved compliance rates and not as an enforcement failure. Enforcement should be applied consistently and equally to ensure fair competition.

Enforcement policies should recognize the need for regulatory flexibility when unique circumstances exist or unforeseen events occur. The federal government should work with states to be more flexible for federal laws and regulations, while enforcement at the local level should be consistent within a state.

Citizen suits can be contrary to sound principles of regulatory law whereby clear standards of conduct are formulated and enforced by a regulatory agency subject to a right of judicial review. Citizen suits introduce uncertainties to pollution control enforcement policies, dissipate resources needed to carry out effective regulatory programs, stimulate litigation and are subject to exploitation. If allowed, such suits should be limited to local persons with affected interests in order to eliminate suits brought for nuisance or harassment purposes. The courts should not approve settlement agreements between regulatory agencies and plaintiffs in citizen suits that were negotiated without the full participation of affected regulated entities.

2.05. Proprietary and Confidential Information
The protection of proprietary and confidential information is of utmost importance to American industry at all government levels. Confidential Business Information (CBI) should be given the full protection intended by Section 1905 of Title 18 of the U.S. Code. Because of the need to protect trade secrets and other CBI, as well as the need to minimize paperwork burdens, information collection requests by federal agencies and their contractors should comply with the spirit and letter of the Paperwork Reduction Act. There should be no exception for surveys made pursuant to settlement agreements in citizen suits.

2.06. Hazardous and Non-Hazardous Waste Management
Waste products are generated by all segments of society, including industrial facilities, commercial establishments, residences and federal, state and local government agencies. To help ensure environmental protection and public health, the NAM supports a comprehensive, efficient and effective hazardous and non-hazardous waste management regulatory system that includes an accessible and affordable infrastructure. These systems should be implemented in ways that ensure effective environmental protection, but minimize complexity and administrative burden.

The Environmental Protection Agency (EPA) has developed a comprehensive regulatory program for the management of hazardous and non-hazardous wastes pursuant to the Resource Conservation and Recovery Act (RCRA). In addition, the NAM supports significant voluntary industrial waste minimization initiatives that minimize volume, reduce toxicity and encourage recycle, reuse and reclaim processes to minimize waste.

2.06a. Regulatory Process for Waste
It is imperative that the distinction between hazardous and non-hazardous waste, as well as the distinction between waste and non-waste, is clarified. Regulations should be tailored to address the different types of waste appropriately. Responsible management of hazardous and non-hazardous waste demands that government, the public and industry cooperate in assessing and managing risk and ensuring regulations support various waste activities accordingly.

The NAM recognizes the primary rights and responsibilities of states regarding land use decisions. The federal government should encourage and support states in their efforts to locate private and public waste management facilities properly within their own jurisdictions. Economic development is dependent on adequate and properly safeguarded waste management facilities, including incineration, landfills and other treatment, storage, disposal facilities (TSDFs). Private ownership and operation of such facilities is desirable.

State responsibility for providing adequate waste disposal and treatment capacity is also recognized by federal law. Federal sanctions requiring states to meet this duty to public health and the environment are appropriate and should be vigorously enforced.

2.06b. Waste Management Methods
Adequate management capacity and techniques must be encouraged by the federal government in proportion to the development of new disposal requirements. No reasonably safe method or facility should be banned or prohibited until such time as superior alternative methods and facilities are available to handle the displaced hazardous and non-hazardous waste. The ability of some methods of managing hazardous and non-hazardous waste to mitigate environmental and health hazards has been questioned. When methods are shown to be ineffective and pose an unreasonable risk to human health and the environment, their authorized use should be discontinued.

2.06c. State and Federal Responsibilities Regarding Waste
State agencies are in the best position to consider and act upon local environmental needs and should have primary responsibility for creating and enforcing hazardous and non-hazardous waste management programs. Under existing law, these programs must be at least equivalent to the requirements set out under RCRA.

The NAM supports the EPA's delegation of and state assumption of regulatory authority over hazardous and non-hazardous waste management programs, so long as environmental protection is assured and the states maintain a consistent approach to regulating these programs.

2.06d. Interstate Transport of Waste
The commerce clause of the U.S. Constitution precludes the states from regulating interstate transport of waste. Companies need maximum flexibility to determine where to dispose of wastes for purposes of waste minimization, recycling, reclamation or treatment consistent with federal regulations. Bans, differential fees and other limiting barriers would prove detrimental to that flexibility.

2.07. Chemical Safety
The NAM supports human health and environmental protection and is committed to ensuring that chemicals and other products are developed, manufactured, distributed and used safely. All

stakeholders—including government, the private sector, and concerned citizens across the country—must be involved to make this effort a success.

NAM members are committed to manufacturing safe, innovative and sustainable products that provide essential benefits to consumers while protecting human health and the environment. No goal is more important than safety to manufacturers. Product safety provides the foundation of consumer trust, and manufacturers devote significant resources to achieve this goal. Environmental, health, and economic impacts should be reviewed and evaluated in all proposed regulations. Economic and societal benefits and costs should be considered in risk management determinations. It is of the utmost importance that innovation, safe product development and affordable consumer choice be encouraged and unnecessary barriers avoided.

2.07a. Toxic Substances Control
The regulation of toxic substances should be administered in a manner that protects health and the environment while avoiding unnecessary adverse economic impacts on business enterprises. The NAM supports chemical reporting requirements that reduce complexity and ensure that reporting occurs at the point of raw materials import in order to coordinate efforts and make global supply chains more transparent. It is of the utmost importance that barriers to innovation and new product development be minimized.

The U.S. chemical management system should be based on credible scientific information. Chemicals posing the greatest demonstrated risk should be targeted through prioritization of chemicals in commerce. Risk to sensitive subpopulations, such as children, should be considered in this process. Tiered and targeted testing should be conducted if necessary information is lacking, and a risk-based process should be used to assess if a chemical is safe for its intended uses. Regulation and prioritization should consider the degree of hazard and reasonable exposure potential associated with intended uses; provide reasonable timeframes for compliance; and ensure transparency, clarity and stakeholder participation.

To ensure the flow of interstate commerce, the U.S. chemical management system should be maintained at the federal level to establish and enforce consistent requirements among federal agencies and states. A "patchwork" approach to chemical management, in which individual states have their own chemical requirements, is ineffective, is contrary to principles of free interstate commerce, and decreases the competitiveness of U.S. businesses. To avoid overlap, policies should be coordinated to establish consistent standards and requirements, enhance protection of the public, promote innovation and competitiveness, and avoid duplication, public confusion and unnecessary negative economic impacts.

2.07b. Use and Source Reduction
Restrictions on manufacturing inputs will reduce the ability of domestic producers to compete in U.S. markets and to supply important export markets. The NAM opposes mandated toxics use reduction (TUR) because manufacturers are in the best position to determine what products to manufacture and how to make safe, reliable products.

As a regulatory approach the NAM supports risk management to control the use of chemicals. The NAM opposes phase-outs and bans on the production and use of specific chemicals without a determination of unreasonable risk. Reduction or elimination of chemicals should not be based on toxicity levels or listing rather than risk. The beneficial uses of chemicals to society should be carefully considered in attempts to eliminate risk, as greater or different risks might be incurred from alternatives or their absence. Compliance timelines should provide ample

opportunity for strategies that result in environmental benefit and innovation or that strengthen U.S. competitiveness.

2.07c. Integrated Risk Information System (IRIS)
IRIS assessments must be transparent: peer reviewed, subject to robust public comment and, when appropriate, subject to enhanced scientific analysis and methods. IRIS must rely on the best available scientific information regarding hazard and exposure, employ consistent and objective methods and models, utilize transparent procedures for evaluating data quality and be uninfluenced by policy. Public involvement should begin at the problem formulation stage.

2.08. Superfund Reform Principles
NAM members have a substantial interest and concern regarding the requirements and operations of the Superfund program. While the NAM supports Superfund's goal of protecting human health and the environment, the Superfund program often requires an extraordinary investment of resources to obtain limited, if any, environmental benefits. Private sector spending on superfund also uses funds that could be invested in people, plants and equipment.

Retroactive imposition of liability, application of joint and several liability to unrelated parties, and imposition of effectively perpetual liability violate basic principles of equity and cripple efforts to remediate sites by spurring litigation.

If Superfund is to achieve its goals in a cost-effective manner, legislative reform should be based on the following principles. First, provide that Superfund is to be used only for sites that present real, significant risks to human health or the environment and that cannot be remediated in a timely manner under other programs, including state voluntary cleanup programs. Second, consistent with the Supreme Court's decision in *Burlington Northern v. EPA*, responsible parties should be held liable only for their fair share of the response costs unless there is no legitimate basis to allocate liability among the responsible parties.

Congress should construct a fair, broad-based funding system that recognizes that the public and private sectors, as well as individuals, have contributed to the creation of Superfund sites. Superfund sites resulted from manufacturing processes and disposal practices that benefitted society, such that the social costs of cleanups at sites without viable responsible parties should be spread over a broad spectrum of taxpayers. Congress should avoid where possible piecemeal reauthorization of Superfund, such as granting carve-outs from liability for municipalities. These will only further damage the program. EPA and states should select remedies based on sound science, realistic risk assessments and practical solutions. The law must recognize the limits of present technology, the need for practical solutions and site-specific risk assessments that focus on actual or probable exposure scenarios. Congress should limit recoveries for natural resource damages to the amounts needed to restore, replace, or acquire the equivalent of any injured natural resources. Finally, Congress should provide complete relief from future liability for a party who remediates a site.

2.09. Product Labeling and Marketing Standards
A product label, when correctly used and understood by consumers, can facilitate consumer understanding. The NAM supports voluntary environmental labeling designed to communicate the following: achievement of meeting a standard or criteria; a characteristic for which no current national standard exists; manufacturers' commitment to the environment and protection of human health; the shared responsibility of government, industry and the consumer to create and support the recycling infrastructure; and information pertaining to recyclability, reuse and use of recycled materials.

The NAM encourages the use of uniform, national standards for voluntary labeling. Product claims should be substantiated by the manufacturers. These claims should be supported by uniform, generally accepted definitions and technical standards. The NAM supports enforcement against fraudulent or intentionally misleading claims. Enforcement of labeling should be conducted by the Federal Trade Commission with technical guidance from the appropriate governmental entities, industry and considering all other technically accurate information.

2.10. Water Quality Control
The Federal Water Pollution Control Act, as amended by the Clean Water Act, established the objective to restore and maintain the quality of the nation's waters. Through limitations on wastewater discharges, water quality in the U.S. has significantly improved. American industry has made a major contribution to this national effort and will continue to support this objective.

2.10a. Pretreatment
The Clean Water Act requires the establishment of pretreatment standards by the EPA for pollutants that interfere with, pass through or otherwise are incompatible with a Publicly Owned Treatment Works (POTW), as well as for those pollutants that prevent sludge use or disposal by such works. These standards are uniform, with no provision for adjustments.

A POTW is a public utility that is financially supported by industry, commercial establishments, institutions and residences. Like other such utilities, POTWs provide necessary services that support employment and economic growth. Many NAM members rely on the services provided by POTWs and thus have an interest in their efficient and continuous operation. The NAM supports pretreatment where it is demonstrably required to protect the operation of the POTW, prevent discharges that would violate the POTW's permit, or prevent the generation of sludge that would not meet regulatory standards.

The NAM also supports equitable user charges that are based on the true cost of treating a company's wastewater. The NAM further supports pre-treatment programs that incorporate the flexibility needed to respond to local conditions in cost effective ways that meet the goals of the Clean Water Act.

The NAM specifically recommends that:

- POTW authorities be allowed to implement their own pretreatment programs, which would include the establishment of local pretreatment standards as necessary to meet established permit conditions;
- All POTW National Pollutant Discharge Elimination System (NPDES) permits be enforced in the same manner as industrial NPDES permits, placing the responsibility for POTW discharges on the municipality in those cases where non-compliance results from POTW deficiencies as opposed to violations of permit limits by indirect dischargers. Non-compliance costs should be allocated accordingly;
- The EPA should retain a role in pretreatment by issuing guidelines to assist POTWs in understanding the elements of the programs necessary to meet the established permit limitations;
- States should be the primary enforcers of POTW permits. Only after a state and POTW have failed to initiate action within a reasonable time after violation of the POTW's NPDES permit should the EPA become involved; and

- Each POTW should be solely responsible for its relationship with its customers. Federal or state agencies should not unduly interfere with decisions POTWs make to ensure adequate treatment of discharges from industrial customers;

The NAM also recommends that the EPA consider integrated facilities when establishing categorical pretreatment standards. Some industries have diverse manufacturing operations that are subject to more than one categorical pretreatment standard. In these "integrated facilities," it may be more cost-effective to combine waste water from each individual operation for treatment purposes. However, categorical pretreatment standards that apply to separate wastewater streams can be a barrier to such cost-effective pretreatment methods.

2.10b. Best Available Technology (BAT) Economically Achievable
The installation of pollution control equipment by U.S. industry to meet current legal limits has resulted in major improvements in water quality. The NAM believes that the Clean Water Act should be implemented in a manner that protects human health and the environment while avoiding costly treatment requirements and other restrictions on industrial discharges that result in little, if any, additional benefit to the quality of U.S. waters. BAT can be defined, in effect, as the best control and treatment measures that have been or are capable of being used. Given the efficacy of existing treatment facilities in removing toxic pollutants and the unrealistic statutory deadlines for establishing toxic effluent limitations, the NAM makes the following recommendations:

- BAT limitations should be required only where there is a significant toxics problem. "Significant toxics problem" should be defined where present limitations are not protecting receiving waters and where further abatement of toxics would have a measurable, positive effect on receiving waters. Situations where a pollutant is present in the effluent solely as a result of its presence in intake waters should not be considered a significant toxics problem;
- Additional requirements for non-conventional pollutants should not be applied unless required to meet water quality standards; and
- A risk-based approach to the regulation of effluent discharges should be adopted.

2.10c. Nonpoint Source Pollution
The relationships between and relative impacts of point and nonpoint sources differ from one part of the country to another, making it difficult to establish a uniform program. What is needed is a balanced approach to point and nonpoint problems that focuses on the water quality of the watershed in question. The NAM, therefore, supports the following:

- More extensive treatment should not be required of any point source dischargers in lieu of regulating nonpoint sources if such treatment will have no appreciable impact on the quality of the receiving waters; and
- Effective management of nonpoint sources of water pollution should be achieved through state and regionally developed programs, taking into account regional differences. The EPA should provide technical and funding assistance, but should not attempt to assume the role of developing a uniform federal nonpoint program.

Congress should stress the need for improving the capability to assess the nation's water quality, to aid in determining the relative impact of point and nonpoint sources on water quality and the ability of waters to meet their designated uses. Conclusions derived from the data can then be used to better allocate the nation's resources in achieving our water quality goals

2.10d. Clean Water Act Jurisdictional Issues
The NAM supports the continued use of the term "navigable waters" in the Clean Water Act and opposes overly broad interpretations of that term and the term "waters of the United States." The term "waters of the United States" should be interpreted to mean waters that are navigable in fact or that have a relatively permanent surface connection to a water that is navigable in fact. The NAM opposes expanded federal jurisdiction over "all intrastate" and "intermittent waters" on the grounds that it raises constitutional concerns and contravenes the intent of the authors of the Clean Water Act. The NAM supports continued federal-state partnerships as an effective means of implementing the goals of the Clean Water Act.

2.10e. U.S. Coastal and Ocean Resources
The NAM supports multiple uses of the nation's coastal and ocean resources. Current federal environmental statutes allow the nation's coastal waters to be used for purposes ranging from resource development to recreation and conservation. An overly prescriptive coastal and ocean resources policy will undermine the careful balancing of diverse interests and uses of this very important resource. In particular, Coastal and Marine Spatial Planning should be an informational tool only. It should not be used to preclude economic uses of oceans, the Great Lakes and coastal areas or to block permits for such uses, while balancing the need to protect these vital natural resources.

2.10f. Total Maximum Daily Loads (TMDLs)
As part of the development of TMDLs, states should assess the technical feasibility and economic practicability of attaining the water quality standard, based on the social and economic impacts of the costs of compliance. TMDL allocations should be developed for pollutants only where appropriate. Other tools should be considered to achieve compliance with applicable water quality standards

2.10g. Whole Effluent Toxicity (WET)
The WET program should be based on scientifically sound criteria and implemented in a manner that requires monitoring and follow up actions only when needed. WET program implementation should appropriately account for the variability inherent in WET testing.

2.10h. Spill Prevention, Control and Countermeasure (SPCC); Definition of Oil Clarification
Further clarification of the term "oil" as it pertains to the SPCC regulations is needed. While the Coast Guard has provided guidance on what constitutes "oil," the EPA has not. Without a consistent definition or determination process, it is often difficult for industry to comply with the SPCC regulations. Some facilities might rely on the Coast Guard's guidance, but an EPA inspector may disagree with the Coast Guard guidance and find the company to be in violation of SPCC regulations. Given these conflicts, overly conservative assumptions drive up SPCC compliance costs.

The EPA's overly broad interpretation of what constitutes a "water of the United States" when determining whether a facility is subject to the SPCC regulations results in uncertainty and increased costs. The EPA should clarify that SPCC regulations apply only to facilities that have a potential to discharge oil to waters that are navigable in fact or that have a relatively permanent surface connection to water that is navigable in fact.

2.11. Groundwater Policy

State governments should retain the principal control and management responsibility for groundwater. Groundwater protection strategy requires a high degree of flexibility and responsiveness to local conditions. The availability of adequate supplies of groundwater for human consumption as well as industrial, agricultural and municipal uses is critical. Multiple groundwater uses must be protected from the potentially adverse effect of municipal, industrial, agricultural and other nonpoint sources such as septic tanks, surface runoff and antiquated sewage systems. Due to the ubiquity of municipal and nonpoint sources of groundwater contamination and to the impracticality of a zero release standard in most activities, protection strategies should be based on a use classification of aquifers.

Industrial substances, discharges and releases potentially affecting groundwater are subject to comprehensive regulation through provisions of the Safe Drinking Water Act, FIFRA, RCRA and other state and federal statutes. Federal groundwater initiatives must build upon rather than ignore or duplicate this body of law. In particular, the toxicity, exposure and risk assessments required for listing and standard setting under current law should be preserved. The NAM opposes any attempt to expand the applicability of these or other environmental laws to reach activities with statutory exemptions. Any expansion of EPA authority over statutorily exempt activities must originate in Congress.

The objective of groundwater policy should be to manage this valuable resource for multiple uses. Drinking water standards are relevant criteria only when there is human consumption of the water. Treatment after extraction or conversion to alternative water supplies may be preferable to large scale groundwater aquifer treatment efforts. Natural attenuation also is a viable alternative to pumping and treating remedies. If a groundwater aquifer treatment effort already is underway, the NAM recommends that the EPA review the remedy to determine if alternate, less energy intensive options are available.

When aquifer cleanup is selected, the principle of "the polluter pays" should prevail, whether an individual, agriculture, government or industry is responsible. State and local governments, as representatives of the public, should bear the full costs attributable to their own activities and to nonpoint source contamination.

Government should continue to encourage the development of improved technologies for recycling and/or destruction or safe treatment of hazardous wastes, and thereby help prevent groundwater contamination and avert costly cleanup efforts. Government should also undertake a program of public education on the causes of nonpoint source pollution in order to get public cooperation in reducing these sources.

Land use, transportation planning, regulation of commercial, residential and industrial development, and, in some regions, control over water withdrawal and allocation are essential elements of any nonpoint source pollution abatement program. These matters have traditionally and properly remained largely the domain of state and local governments.

2.12. Water Conservation

Manufacturers have demonstrated leadership not only minimizing environmental impact to water supplies but also helping to ensure adequate water supplies through conservation efforts. The NAM supports voluntary policies that take a multi-sectoral approach and drive the use of technology solutions and innovation toward water conservation efficiency and reuse to reduce potential risks related to water scarcity.

2.13. Air Quality Control
The NAM believes that the objectives of the Clean Air Act to protect public health and welfare are desirable and supportable. The NAM believes the best strategy is to expeditiously identify and adopt technological innovations to continue to improve our environment.

American industry spends billions of dollars annually toward air quality protection and has achieved remarkable improvements in air quality. Increasingly, the Clean Air Act is being implemented in a way inconsistent with the original model of cooperative federalism, leaving states with a diminished role. The costs for individual rules are exponentially increasing, and manufacturers and other regulated sectors are left waiting years for courts to resolve overreaching regulations. Manufacturers are committed to clean air, but we need policies that support a sustainable environment and economy. The decades old Clean Air Act should be reformed and modernized to allow for continued improvements in air quality, while being flexible enough to better account for challenges created by extraneous factors such as foreign emissions, unique geography or topography and technological limitations and cost effectiveness.

Because of the enormity of capital expenditure and operation and maintenance costs associated with compliance with federal air quality programs, the NAM believes that federal policymakers should consider thorough, balanced, sound and objective scientific studies before making regulatory decisions. The NAM also recognizes that manufacturers who make market-based decisions to deploy energy efficient technology also reduce emissions that may fall under the jurisdiction of the Clean Air Act. The NAM recognizes that appropriate use of market-based mechanisms achieve environmental objectives more effectively and efficiently than command-and-control programs.

As a general policy matter, the NAM supports streamlining air quality control regulations that are focused on the manufacturing sector. U.S. industry and regulators continue to struggle with the complex requirements of the New Source Review (NSR) program. NSR often triggers evaluations that can last for several years when a particular facility attempts to upgrade or install technologies that lead to increased energy efficiency, thus potentially undermining the achievement of appropriate air quality and environmental policy goals. Such obstacles undercut improved air quality by delaying the installation of more efficient technology. The NAM therefore supports ways to streamline and reform NSR requirements, including the development of practical routine repair, replacement and maintenance exemption provisions.

2.13a. National Ambient Air Quality Standards (NAAQS)
The Clean Air Act requires federal regulators to review the National Ambient Air Quality Standards (NAAQS) for criteria pollutants, including particulate matter and ozone, every five years. With the tremendous air quality progress made over recent decades, the NAM supports reform of the Clean Air Act to better address the current challenges that arise during the NAAQS review and establishment process. The NAAQS process should be modified to incorporate a timeframe more consistent with 1) implementation schedules and 2) the time necessary to adequately review the large volume of material relevant to review and setting standards. Implementation guidance and rules and updates to modeling and permitting tools should be in place when the NAAQS is changed or within a reasonable and defined amount of time. NAAQS should be set in a transparent manner with consideration of the public health and welfare, energy and economic impacts, and the standards should be set taking into account background (non-U.S. manmade sources) in order to provide the necessary flexibility for compliance. Furthermore, the NAM strongly supports review of the NAAQS by diverse and well qualified representatives of the scientific community with relevant expertise, based on sound,

peer-reviewed, objective studies. The EPA should not rely on internal re-analyses of published peer-reviewed studies if the EPA's re-analysis has not itself been individually peer reviewed and published. The NAM encourages the EPA to appoint a broad array of members to its independent advisory panels to promote rigorous and thorough study of proposed regulations based on sound science.

2.13b. Emission Offsets and Controls Required in Non-Attainment Areas
The basic rule in non-attainment areas is that no new major sources of pollution can be constructed without obtaining a permit that imposes stringent control requirements and requires sufficient "offsets" to assure progress toward attainment of the NAAQS. Offsets are enforceable emission reductions by existing sources of pollution that are applied to counterbalance the anticipated emissions from new sources.

Offset requirements should be tied to reasonable and available reduction opportunities. Regulators should consider reasonable cost thresholds when establishing these requirements. In some U.S. locations, the availability of offsets is very limited and thus the cost is tremendous. The NAM believes that air quality goals should be commensurate to the expense associated with implementation of those goals.

Federal regulators must recognize the general market principle of diminishing cost-effectiveness of new control technologies to meet more stringent requirements relative to the potential incremental health and environmental benefits obtained. Control costs increase exponentially to achieve minimal incremental benefits as regulators impose requirements approaching a level of "zero risk."

2.13c. Hazardous Air Pollutants
The NAM supports regulation of hazardous air pollutants that pose a threat to public health. However, any such regulation must be based upon sound scientific data that clearly demonstrate a need to protect public health and consideration of the welfare, energy and economic impacts. The EPA's inability to meet arbitrary deadlines should not trigger automatic regulation. The NAM supports comprehensive reform of the EPA's listing and delisting process.

2.13d. New Source Performance Standard (NSPS)
The NAM believes that NSPS should be streamlined and simplified to provide manufacturers with certainty that they are in compliance with the law. In addition, emission standards should be set using criteria that ensure optimal cost effectiveness and do not hinder economic growth and competitiveness. EPA should also allow adequate timing to demonstrate compliance once an NSPS is triggered.

2.14. International Environmental Programs
Varying environmental quality control requirements can affect the competitiveness of a nation's industries in world markets. In order to avoid distortions in international trade, the NAM supports cooperation in international notification and consultation when a nation proposes major changes to its environmental protection programs, as well as in the development of intelligent measures to deal with dislocation or inequities in international trade brought about by differences in environmental standards. Cooperation in gathering and disseminating environmental data and information should also be encouraged.

2.15. Environmental Justice
The NAM fully supports the non-discriminatory administration of environmental programs. Federal, state and local environmental agencies should administer and enforce all

environmental statutes and regulations in a non-discriminatory manner. The NAM recognizes the importance of economic prosperity to, and its interrelationship with, health and environmental protection. The NAM encourages its members to develop and maintain clear lines of communication with communities that host industrial facilities. More specifically, the NAM encourages manufacturers to work with local communities, local and state governments and the EPA to achieve an open and informed dialogue on their facilities' environmental performance, in order to assure healthy and safe communities in which they operate. Additionally, we support:

- The federal goal that no person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance;
- State efforts to increase dialogue among government officials, local communities and facilities in order to recognize and respond to community questions and concerns about facility operations;
- State development of public participation procedures that will respond to community concerns. State environmental justice procedures should include guidance for early and meaningful public participation. The concerns of interested citizens within the community should be addressed early in the regulatory decision-making process. For example, concerns should be addressed concurrently with the technical review of a permit application, rather than being relegated only to comments on proposed decisions or subsequent, wasteful litigation. States should document the public participation process within reasonable timeframes. State procedures also should assure and document appropriate due process and reasonable timeframes for permit applicants to address public participation concerns; and
- An EPA role in developing mechanisms to identify actual exposures to harmful substances using scientifically sound methodologies. The EPA should also assure that permitting under existing environmental statutes continues to be an agency priority.

2.16. Facility Security

As a nation, we have demonstrated firm resolve in protecting our critical infrastructures and key assets from terrorist exploitation. In this effort, government at all levels, the private sector, and concerned citizens across the country are involved in an important partnership and a commitment to action.

The NAM members have a substantial interest and concern regarding requirements and administration of facility site security programs. NAM members prudently engage in risk management planning and invest in security as a necessary component of their business operations and to assure customer confidence. However, manufacturers have great concern about duplicative government security requirements and federal actions that do not take into account voluntary actions companies already implement.

The term "security" means actions carried out to ensure or enhance the protection of manufacturing facilities' security-sensitive assets, including, but not limited to: employee training and background checks; protection of the perimeter of the facility; protection against and prevention of access to controls of the plant; installation and operation of intrusion detection sensors; and the implementation of measures to increase computer or computer network security.

As public policy or legislative proposals to authorize enforcement of security vulnerability assessments and security plans for private facilities are developed, the NAM recommends adherence to the following principles:

- Avoid chemical elimination or reduction schemes disguised as security measures. The NAM has seen legislation at both the state and federal levels that purport to be based on security concerns, yet the effect would be "toxic use reduction." The bills, prompted by misusing phrases such as "inherently safer technology" (IST), ignore the commitment to improving safety at every phase of operations. Decisions about IST involve complex process safety issues that require a holistic approach. These judgments should be made by experts in the field rather than by government mandate. Initiatives that focus on IST distract from the real issue of security.
- Recognize security work that has already been implemented by companies and through safety and security management principles from their respective associations. It would be wasteful (and unfair) to require companies to add an additional governmental layer of bureaucracy onto existing industry programs, which often include requirements of other government regulations that include all the necessary components of security. Manufacturers should be deemed to be in compliance if they have implemented an industry standard that is determined to be substantially equivalent to the requirements of relevant federal security law.
- Consider provisions that would recognize work done under existing state, local and other federal regulations/laws. This would avoid disruption of the ongoing security work being completed by manufacturers under the approval of federal and state authorities. Chemicals should be exempted if they fall under an existing federal or state security regulatory program.
- Foster continued information sharing between manufacturers and federal, state and local officials in order to enhance security. Information submitted to the government must be properly safeguarded to ensure against release to the public. Such releases of information could undermine the very security that any legislation or information sharing would seek to enable.
- Promote and recognize voluntary cooperation and agreement among all parties and encourage voluntary actions. Partnerships are currently providing the foundation for developing and implementing coordinated protection strategies.
- Ensure some limitation of liability from civil lawsuits in the event of a terrorist act. No legislation or rule should be construed to create a private right of action or grant jurisdiction to a court that enables private persons to enforce the law or rule against anyone subject to it. Allow only those parties that are directly subject to a rule to bring a petition for review against a rule, not just "any person."
- Security investment reflects what is reasonable in light of threat and vulnerability conditions, as well as what is economically justifiable and sustainable in a competitive marketplace or in an environment of limited resources.
- Allow for flexibility in achieving standards established by legislation and recognize that the level of risk and the attractiveness of a target vary from facility to facility, even within the same industry. No federal program should take a one-size-fits-all approach to security and should instead recognize the variable nature of risk, allowing companies to achieve compliance in a way best suited to their particular situation.

2.17. Recycling

Recycling continues to be an environmental, economic and societal success story led by manufacturers, many of which utilize recycled materials on a daily basis to make new products

that add value to the economy. The private and public sectors have invested billions of dollars in infrastructure enabling citizens and businesses to reduce, reuse and recycle efficiently. Recycling helps numerous industries reduce their energy use, along with greenhouse gas (GHG) emissions. Recycling conserves non-renewable natural resources and raw material supply, creates jobs, contributes to the economy and offers consumers an efficient method to reduce their environmental footprint.

The NAM supports the collection, processing and subsequent reuse of recyclable materials. The NAM supports the principles of sustainable materials management, consistent with sections 2.0 and 2.05 of the NAM Environmental Quality and Sustainability Policy. The NAM supports life cycle thinking as a key tool for manufacturers making informed decisions and understanding the impacts of products including end of life options.

No one-size-fits all approach works in recycling. Different commodities may require different approaches or solutions when looking at opportunities to initiate and/or increase recycling. The NAM supports initiatives to identify and promote best practices in capturing recyclable materials. Policies should recognize and, when appropriate, credit manufacturers for their use of renewable and recyclable materials in the manufacturing process. The NAM supports additional public education to help raise recycling rates and quality.

Market forces should guide recovery and recycling systems:

- As with other goods and commodities, the NAM supports international free trade and open markets for recycling activities and materials.
- Voluntary actions can and should be part of the solution.
- The NAM supports policies that recognize the value of recyclable materials as economic commodities.

IIHRP-01 Transportation Policy

Transportation is the lifeblood of any economy. Transportation efficiencies, including adequate infrastructure and sound regulatory policies, can contribute greatly to national economic growth and competitiveness. At present, our transportation infrastructure is in a state of disrepair. The safe and efficient movement of freight and people across our country over land, water, or by air requires a renewed commitment to maintenance and expansion of our transportation infrastructure.

1.01. National Transportation Policy

The NAM supports transportation policies that:

- Emphasize safety: The public welfare, including the protection of life, property and productivity, warrants reasonable expenditures and regulations to address identified safety concerns in a cost-beneficial manner

- Ensure U.S. manufacturing competitiveness by providing increased federal, state, and local funding for maintaining, improving, and expanding public infrastructure: Excise taxes and other fees charged directly for transportation-related development should be used for transportation-related infrastructure expenses. And should encourage

Senator BARRASSO. Thank you very much, Mr. Eisenberg.
Ms. Lipman, thank you. Welcome to the Committee.

STATEMENT OF ZOE LIPMAN,
DIRECTOR, BLUEGREEN ALLIANCE

Ms. LIPMAN. Thank you, Mr. Chairman and members of the Committee. Thank you for the opportunity to testify today.

The BlueGreen Alliance unites America's largest labor unions and its most influential environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a stronger, fairer economy. In our work, we see that the innovation being carried out by workers and companies across America to meet our pollution and climate challenges is not just important to the environment, but is a critical driver of American competitiveness and job growth.

Worldwide, the race is on to deliver better energy, transportation, and infrastructure that is efficient and lower emitting. The places that can meet these needs first, best, and can continue to do so into the future will have a powerful leg up in the future economy.

We share the enthusiasm of others on this panel around the innovation happening today in America both to build the technology that cuts air emissions and to improve the manufacturing processes to make them more efficient and lower polluting.

I want to talk today about what is needed to sustain this progress.

We support the nation's invaluable network of national labs and the critical energy and transportation technology programs at the Department of Energy that build on this expertise, and we underscore the critical importance of the agency's commercialization and manufacturing programs that help ensure we turn innovative technology into equally innovative, globally competitive manufacturing and jobs in America.

Thanks to efforts to improve the efficiency, emissions, and energy competitiveness of America's most energy intensive industry, some of which have been mentioned already today, America's steel and aluminum manufacturers, for example, are some of the cleanest, lowest emitting, and most productive in the world, while upholding good wages and high labor standards at the same time. Our tax, trade, and international agreements should help us support and defend the industrial leadership being shown by companies here, not undermine them.

But equally important to sustaining the innovation we are seeing today in cutting air emissions are sound, long term, globally leading standards. A sound regulatory framework is critical to provide companies with the certainty necessary to make the large long term investments in innovation at scale.

Regulations are working not just to cut air emissions, but to dramatically spur innovation, investment, and job growth. As proof, look no further than the car or truck in your driveway.

Over the past decade, the auto sector has been transformed, as has already been mentioned; not just the car makers themselves, but the huge network of suppliers and manufacturing that is connected to them. Under the current fuel economy and vehicle green-

house gas standards, not only has the industry achieved unprecedented cuts in emissions, but the industry has returned to profitability and growth, and has built great cars, SUVs, and pickup trucks that consumers have snapped up at record levels. Fuel efficiency gains are saving drivers of all kinds of vehicles billions of dollars a year, enhancing America's energy security, and underpinning a gradual recovery of U.S. manufacturing as a whole.

In June we released a report of the Natural Resources Defense Council where we found over 1,200 factories and engineering facilities in 48 States and 335 congressional districts, and 288,000 workers building the specific technologies that go into improving fuel economy and cutting emissions in today's cars and trucks. This is two and a half times as many factories and engineering facilities, and almost twice as many workers as we found in a similar study in 2011. But even that impressive growth doesn't fully capture the recovery of a dynamic, innovative, far more competitive automotive manufacturing supply chain and industry.

Take, for example, the Ford F-150. This is a very popular pickup truck, but it still only makes up a small percentage of the vehicles on the road. Nonetheless, the fuel saved by just the new F-150s built since the fuel economy standards began implementation in 2012 cut carbon emissions equivalent to the total electricity use of the city of Boston.

Achieving those gains required innovation not just in vehicle design and assembly, robotics, and training by Ford in Missouri and Michigan, but aluminum companies in Tennessee and Iowa, which developed and built new types of aluminum, aluminum treatment, and aluminum joining. Iowa and Indiana steel facilities developed and manufactured new lightweight, high strength steel for the vehicle frame. Ford holds several hundred patents for parts of the truck's efficient EcoBoost engine and has made multiple rounds of retooling investment in the plants that build it. The company that makes the F-150's efficient electric power steering faced bankruptcy in 2009, but today is the biggest employer in Saginaw County, Michigan.

Just these few examples represent billions in automaker and supplier investment, and likely hundreds of millions above and beyond business as usual. They represent real factory investments and jobs coming back to communities all across America.

We know what the tools are that have spurred this innovation; not just in transportation, but also in the energy and industrial sectors. Whether it is support for R&D and technology development, for commercialization, manufacturing and work force investment, or the clear regulatory framework necessary for companies to make these important investments in innovation. And we need to use them all to ensure that we invent the next generation of technology, build it here, and build good jobs in America doing so.

Thank you very much, and I look forward to answering any questions you have.

[The prepared statement of Ms. Lipman follows:]

Zoe Lipman
Director, Vehicles and Advanced Transportation Program
BlueGreen Alliance

Zoe Lipman directs BlueGreen Alliance's Vehicles and Advanced Transportation Program and the organization's policy and research on related emerging technology, manufacturing and economic topics.

Prior to joining BGA, Lipman headed National Wildlife Federation's policy and advocacy on fuel economy and advanced vehicles, and previously led NWF's Midwest climate policy program. Lipman has written on advanced vehicle supply chains, transportation and utility sector innovation, and the automotive recovery. She has served on utility, transportation and climate policy forums at a state, regional and federal level and works closely with labor, environmental, business and government stakeholders.

Before joining NWF, Lipman worked in management consulting and as a trade union official in the US and overseas. Lipman holds a BA from Yale University and a Masters in Public Administration from Harvard's John F Kennedy School of Government.

Testimony of Zoe Lipman
Director, Vehicles and Advanced Transportation Program
BlueGreen Alliance

Before the U.S. Senate Committee on Environment and Public Works

November 15, 2017

Mr. Chairman and Members of the Committee,

Thank you for the opportunity to testify before the committee today regarding, "Promoting American Leadership in Reducing Air Emissions through Innovation." The BlueGreen Alliance (BGA) unites America's largest labor unions and its most influential environmental organizations to solve today's environmental challenges in ways that create and maintain quality jobs and build a stronger, fairer economy. In our work, we see every day that the innovation being carried out by workers and companies across America to meet our pollution and climate challenges is not just important to the environment it is a critical driver of American competitiveness and job growth.

Worldwide, the race is on to deliver better energy, transportation, and infrastructure to more people in ways that don't pollute, are more efficient, and use fewer resources. The places that can meet these needs first, best, and can continue to do so, will have a powerful leg up in the future economy. Today we are seeing some powerful progress, but that didn't happen by accident. It was a combination of creativity and innovation, major investments and smart technology, manufacturing, and regulatory policy that made this possible. If we are going to protect and build on these gains, we are going to need to continue to use all the tools in our toolbox.

We share the enthusiasm of others on the panel around the innovation happening in today in America both to build technology that cuts air emissions and to improve manufacturing processes to make them more efficient and lower polluting.

We support the nation's invaluable network of national labs and the critical technology programs at the Department of Energy (DOE) that build on the expertise of the labs. These efforts bring together scientists and industry in collaborative initiatives around strategic technologies that become the jumping off place for a profusion of private sector products and processes.

And we underscore the critical importance of commercialization and manufacturing programs like the Advanced Technology Vehicles Manufacturing loan program, the Advanced Manufacturing Office and programs at DOE, the Manufacturing Extension Partnership at Commerce, and others—that help ensure we turn innovative technology into equally innovative, globally competitive manufacturing and jobs in America. It's not enough to invent and use the best cleanest technology in America—we need to build it here too.

I'd like to note, in particular, our support for efforts to improve the energy efficiency and energy competitiveness of intrinsically energy-intensive heavy industry and materials manufacturing. The result, as you'll likely hear from other speakers today, is that America's steel and aluminum manufacturers, for example, are some of the cleanest, lowest emitting, and most productive in the world, while upholding good wages and high labor standards at the same time. In return, however, our tax, trade, and international agreements should also include sound environmental and labor standards that help us support and defend the industrial leadership being shown by companies here, not undermine them.

But equally important to sustaining the innovation we're seeing today in cutting air emissions are sound, long-term, globally leading standards. A sound regulatory framework is critical to provide companies with the certainty necessary to make large long-term investments in innovation at scale.

For a vivid example of how regulations have worked not just to cut air emissions but to dramatically spur innovation, investment, and the job growth that follows, look no further than the car in your driveway.

Over past decade, the auto sector has been transformed—not just the car makers themselves, but the huge network of suppliers and manufacturing that is connected to them. Under the current fuel economy and vehicle greenhouse gas standards, not only has the industry achieved major improvements in efficiency and cuts in emissions, but the industry has returned to profitability and growth, and has built great innovative cars, SUVs, and trucks that consumers have snapped up at record levels. The major efficiency gains occurring in vehicles of all types are also saving consumers billions of dollars a year, enhancing America's energy security, and underpinning a gradual recovery of U.S. manufacturing as a whole.

BGA is engaged in ongoing research that demonstrates that the standards, together with smart manufacturing policy, have been a critical driver of this innovation, investment, and growth, and are equally critical to sustaining it.

In June, we joined with the Natural Resources Defense Council (NRDC) to release a report identifying manufacturers nationwide of the automotive technologies that specifically go into increasing fuel economy and cutting emissions.

We found over 1,200 factories in 48 states and 335 congressional districts—and almost 300,000 workers—building the clean and fuel efficient technology that goes into today's innovative cars and trucks.[1]

This is two and a half times as many factories and engineering facilities, and almost twice as many workers, as we found in a similar study in 2011. But even that impressive growth doesn't fully capture the recovery of a dynamic, innovative, far more competitive automotive manufacturing supply chain and industry.

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[1] Natural Resources Defense Council and Blue Green Alliance, *Supplying Ingenuity II: U.S. Suppliers of Key Clean, Fuel-Efficient Vehicle Technologies* (June 2017). Available: https://www.bluegreenalliance.org/resources/supplying-ingenuity-ii-u-s-suppliers-of-key-clean-fuel-efficient-vehicle-technologies/.

For example, many in the public have probably heard that today's Ford F150 pickup truck is more fuel efficient and more powerful than the same truck in 2010, and that that has something to do with the new materials the truck uses. In fact that truck—and virtually every new vehicle in America—is significantly lower polluting. The F150 is a very popular vehicle, but still makes up only a small percentage of the vehicles on the road. Nonetheless, the fuel saved by F150s built since fuel economy standards began implementation in 2011 alone, cuts carbon emissions equivalent to the total electricity use of the city of Boston.[2]

Achieving those gains required innovation not just in vehicle design and assembly, robotics, and training by Ford in Michigan and Missouri, but by aluminum companies in new types aluminum, aluminum treatment, and aluminum joining in Tennessee and Iowa (and many other locations). It required steel companies in Ohio, Indiana, and elsewhere to develop and manufacture innovative steel chemistries and processes to create the new light weight, high-strength steel for the vehicle frame. Ford holds several hundred patents for elements of the efficient EcoBoost engine, which powers the F150 (and vehicles across its fleet), and has made multiple rounds of retooling investment in the engine plants that build it just since 2011. The company that makes the F150's efficient electric power steering faced bankruptcy in 2009, but today is the biggest employer in Saginaw county, Michigan, and is looking forward to lead in drive systems for autonomous vehicles as well.[3,4]

Just these few examples—and they are just a few out of dozens if not hundreds in the F150 alone—represent billions in automaker and supplier investment and likely hundreds of millions of dollars more than business as usual. They represent real factory investments and jobs coming back to communities all across America, and they represent a rebuilt, innovative, interconnected, globally competitive automotive supply chain in America. Certain long-term leading standards are essential for companies to continue to be able to make these large, long-term investments, and to make them here.

Worldwide, transportation technology is changing fast, and all across Europe and Asia countries are looking to lead in the next generation of vehicle technology. We have demonstrated in the U.S. auto sector that with the right tools, we can come back and lead. And this would be no time to take the foot off the gas.

We need to keep the powerful trend of innovation going in the transportation sector, but this success also has lessons across the energy and industrial sectors. We know what the tools are—whether support for R&D and technology development, or for commercialization, manufacturing, or workforce investment; or the clear regulatory framework necessary for investment to innovate at scale—and we need to use them all, to ensure that we invent the next generation of technology, build it here, and build good jobs in America doing so.

Thank you and I look forward to answering any questions you may have.

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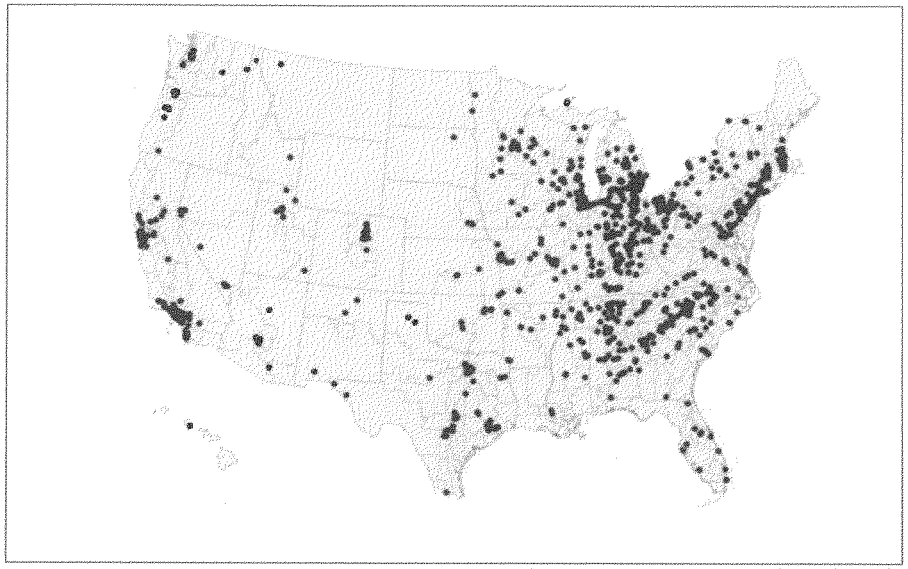
[2] BlueGreen Alliance, "Combating Climate Change 426,000 Pickup Trucks at a Time," June 2016. Available: https://www.bluegreenalliance.org/resources/combating-climatechange-426000-pickup-trucks-at-a-time/.
[3] Ibid.
[4] *Supplying Ingenuity II*

Suppliers of fuel-efficient and low emitting vehicle technology – more than 1200 facilities nationwide



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Fuel-efficient vehicle technology - employment by Congressional District
Fuel Efficient Vehicle Technology Assembler and Supplier Employment
1 - 100
101 - 250
251 - 500
501 - 2,000
2,001 - 5,000
5,001 - 10,000
10,001 +
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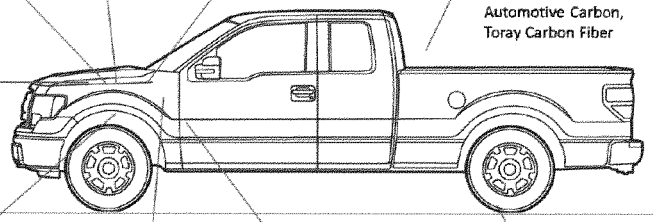
Examples of U.S. Manufacturers of Fuel Efficiency Technology



GASOLINE DIRECT INJECTION
8% of new vehicles in 2010, 46% in 2015.
Keihin, Stanadyne, Auto OEMs

TURBOCHARGING
Global market expected to grow 10% per year through 2025.
BorgWarner, Bosch

NEW: 48 V MILD HYBRID SYSTEMS
Delphi, Continental

LIGHTWEIGHT MATERIALS
High-strength steel: ArcelorMittal, AK Steel **Aluminum:** Arconic, Novelis **Carbon fiber:** SGL Automotive Carbon, Toray Carbon Fiber

HYBRID POWER TRAIN
Mitsubishi Electric, Allison Transmission, GM Components Holdings

CYLINDER DEACTIVATION
Utilization has doubled 2010 - 2015. Eaton, Schaeffler Group

EV/ PHEV PROPULSION
Battery Systems: LG Chem, Mahle Behr **Electric Motors:** Magna Electronics, Remy **Electronic Controllers:** UQM Technologies, **Renesas Wiring:** Leoni, Sumitomo Electric

START/STOP COMPONENTS AND SYSTEMS
Not used in 2010, in 7% of new vehicles in 2015, rapidly expanding use.
Johnson Controls, Maxwell Technologies

8+ SPEED TRANSMISSIONS
In 2010 companies were adding 6 - 8 speed transmissions, now 8 - 10 speeds.
Aisin, Auto OEMs

ELECTRIC POWER STEERING
Nexteer, JTEKT

OTHER ADVANCED TRANSMISSIONS/
CVT JATCO, Xtrac, Auto OEMs

LOW ROLLING RESISTANCE TIRES
Goodyear, Bridgestone, Michelin

Note: Many additional U.S. manufacturers produce each of these technologies. Indicators of growth are drawn from agency, industry, and press reports.

Source, all diagrams: Natural Resources Defense Council and Blue Green Alliance, Sapping Ingenuity II: U.S. Suppliers of Key Clean, Fuel-Efficient Vehicle Technologies (June 2017). Available: https://www.bluegreenalliance.org/resources/sapping-ingenuity-ii-u-s-suppliers-of-key-clean-fuel-efficient-vehicle-technologies/.

BLUEGREEN ALLIANCE

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Senate Environment and Public Works Committee
Hearing entitled, *"Promoting American Leadership in Reducing Air Emissions Through Innovation"*
November 15, 2017
Questions for the Record for Zoe Lipman

Senator Whitehouse:

1. Do you think it is worthwhile to consider developing technologies that can draw CO2 out of the ocean as well as the atmosphere?

Lipman response: All across America – and in all industries and sectors of the economy – we are seeing scientists, engineers, workers and companies that are innovating to cut pollution, improve efficiency, and develop powerful, viable, and cost-effective solutions to climate change. These are not only critical for the environmental and public health benefits they provide, but America needs to continue to lead in inventing, manufacturing, and deploying clean and carbon-reducing technologies if we are to continue to secure and grow American jobs and competitiveness in a rapidly innovating global economy.

This environmentally and economically critical innovation and investment includes technologies that capture carbon dioxide from industrial emissions, from the air, and from the ocean – often while creating new commercially useful products. To meet both our global economic and environmental challenges at the scale we currently need, we must continue to innovate across all these areas.

2. Do you agree that our national labs and research institutions would be an appropriate place to house this type of technological innovation?

Lipman response: Absolutely. Our national labs play a critical role in innovation that spans advanced energy, transportation, and carbon reduction strategies. The Lawrence Livermore National Lab, for example, is innovating around CO2 capture from the ocean, specifically. What's more, our National Labs, research institutions, and the Department of Energy in particular, have played a critical role – working together and with a wide range of academic, industry and other stakeholders - in ensuring that we don't just invent, but commercialize and build the leading technologies in America that are needed to meet global challenges like climate change and ocean acidification.

Senator BARRASSO. Well, thank you very much to all three of you for this very interesting testimony.

We will start with questioning. I will start with a question for Mr. Coddington.

It seems that many of the innovative technologies that are being applied by the private sector benefit from basic research and development conducted by the Federal Government and by our nation's universities. This research has been especially beneficial when there is collaboration between industry, universities, government entities at both the State and the Federal level.

So, can you elaborate a little bit on some of the partnerships between the University of Wyoming and businesses in Wyoming to support research, and how does this collaboration lead to more targeted and applied research?

Mr. CODDINGTON. Mr. Chairman, thank you for your question. Yes, as you mentioned in your introductory remarks, the School of Energy Resources was created, in part, a decade ago to help build those bridges, and it is one of the benefits of being in the State of Wyoming, where you can cross the aisle and work collaboratively with partners and industry.

Under most of the Federal grants that we are implementing, there is, in fact, a mandated cost share requirement that requires us to reach out for State dollars or private sector dollars on many of these projects.

With respect to our carbon capture and storage projects, we are privileged to be teamed with two major utilities in the State of Wyoming, other oil and gas partners, drilling companies and the like; and indeed, I cannot think of a major project we have underway that does not have the participation and some role—typically major—of a private sector partner.

We do very much have an economic focus. All research and development is good, but at the end of the day it has to be economic and work toward the public good, so you need that private sector input, and we are very sensitive to that.

So, to conclude, UW is very proud of our collaborations with various entities in the State, including the private sector, and I don't think we could do that work without them. Thank you.

Senator BARRASSO. And Mr. Eisenberg, at a hearing held in September, David Greeson was here from the NRG Energy, and he explained the burdens that New Source Review posed to the Petra Nova carbon capture project. He spoke how New Source Review is a barrier because of the uncertainty the current regulatory framework presents to business.

In your testimony today, you explained that New Source Review discourages emissions reduction projects in the manufacturing sector, as well as in the power generation sector. So, could you possibly elaborate a little bit further with maybe some specific examples?

Mr. EISENBERG. Absolutely. Thank you. A lot of the same problems that the utility sector experiences on New Source Review pervade the same sort of upgrades that we are trying to do in the manufacturing sector. Most manufacturers have an industrial boiler in place, either steam turbine or a gas turbine, to produce energy and heat. The manufacturers of the control technologies for

those believe that there is a technology out there that are a series of upgrades that could improve the efficiency by 2 and a half percent that would result in about 6 and a half percent reductions per megawatt hour of greenhouse gases. The majority of their customers aren't doing it because this would trigger New Source Review, and it would sort of start the saga.

Another good example is if a pulp mill is taking down two older—let's say coal fired boilers, and then to replace them with one gas fired boiler, when you are considering that, the only thing you consider going into NSR is that you are building a new gas fired boiler, not that you are having a net reduction of, let's say, 200 tons per year of NO_x, or whatever the pollutant that you are trying to control is. So, that factors very heavily into the decision as to whether or not you are going to take on this project.

There is a lot of opportunity here. Obviously, there are plenty of manufacturers making control technologies across the board for these pollutants. And I am not suggesting that NSR shouldn't happen; it is just let's figure out a way to actually let it enable some of these efficiency upgrades. That is really all we are looking for.

Senator BARRASSO. Mr. Coddington, the University of Wyoming supports this unique public-private partnership known as the Integrated Test Center that we talked about. It is going to be one of the first research facilities in the world located at an operating coal fired power plant. The ITC researchers are going to study how to use the excess carbon dioxide that is captured at the plant and turn it into a valuable product.

Can you talk a little bit about how this research is going to support further reductions in carbon emissions?

Mr. CODDINGTON. Yes, Mr. Chairman. So, as you indicated, the Integrated Test Center should start operations in January 2018. It is the only center of its type in the United States. It will upscale increase from the good work that is currently being done at the National Carbon Capture Center. The researchers there, including the first tenants, which are the NRG COSIA Carbon XPRIZE, will be looking at ways to more efficiently both capture carbon dioxide emissions from a coal fired power plant, that being Dry Fork Station, and they will also be conducting research on how to make beneficial use of that carbon dioxide. Indeed, making maximum use and economic use of the CO_2 is one of the major purposes of the Carbon XPRIZE. So, the ITC, by design and definition, is fulfilling the mission of pursuing economic technologies to reduce carbon dioxide emissions from coal fired power.

Senator BARRASSO. Thank you.

Senator Carper.

Senator CARPER. Thanks.

Thanks again, everyone, for joining us and for your testimony today.

As my colleagues have heard me mention, I am a native of West Virginia. My dad, coming out of high school, worked at a coal mine in Beckley for a while, before going off to World War II, and I have a strong feeling and affection for people in West Virginia, and in Wyoming, including a cabin in Wyoming, Delaware. It caused a big deal in coal, a big deal in Wyoming as certainly my native State. I have supported clean coal technology for longer than probably a

bunch of the people in this room have been alive. Robert Byrd was one of my early mentors while I was in the House and later as a Senator here.

Having said that, I was pleased to work with Ted Stevens, Dianne Feinstein, and others on regulations, CAFE regulations, actually, on legislation raising for the first time in some 30 years fuel emission standards, mileage standards, fuel efficiency standards back in 2007; and we have seen, as is always mentioned about the kind of job growth that has taken place as a result.

I think one of the most important things we do, as I said earlier, in Government is create a nurturing environment for job creation, job preservation. With respect to fuel savings, efficiency savings, reductions in emissions that have flowed from the changes since the 2007 law was signed by George W. Bush has been remarkable.

The role of Government in this is not just to pass laws or regulations that sort of put the meat on the bones of the laws, but we also have the opportunity to make investments in R&D, smart investments that help lead to technologies that can be commercialized and lead to these efficiencies. A second thing that we can do is have tax policy that incents people to buy energy efficient vehicles, and we have that today. The third way that we do it is we use the Government's purchasing power to help create a market for these new technologies and new products, and we need to do all of that. Plus, we have invested a whole heck of a lot of money in clean coal technology, as I think most of us know.

I am going to ask Zoe a question. One of the most important things we can do in Government is, as I said, create that nurturing environment. We tried to do that in Section 143 of the FAST Act a couple of years ago, which requires the Department of Transportation to designate national electric vehicle charging hydrogen propane and natural gas fueling corridors. These proposed corridors are nominated for designation by State Department for Transportation and local entities.

I would just ask Ms. Lipman are you familiar with that provision in the FAST Act that requires and supports new transportation innovation? If so, how would you recommend that we build on it in other policies to incentivize more private sector innovation for alternative fuels and alternative fuel infrastructure?

Ms. LIPMAN. Thank you. I am not familiar with the details of that policy, but definitely with the broader——

Senator CARPER. Go ahead.

Ms. LIPMAN [continuing]. Efforts to promote not only electric and other alternative vehicle charging and fueling infrastructure, but also the vehicles themselves. And I would underscore that we are really in a race for the next generation of vehicle technology worldwide. A couple decades ago people had questions about whether electric vehicles were real and whether the U.S. had what it takes to build the technologies, especially the electric powertrain, the batteries, et cetera.

Today we have manufacturers of both the components that go into electric vehicles and into the infrastructure across the nation; there are probably two dozen in Indiana alone, as well as all across the south, in California, in Texas. And there is rapidly growing interest not only, and I think this is something that crosses over into

the electric sector as well, but in using the technology that goes into charging to also help us upgrade and make more resilient our electric grid.

So, there is a tremendous opportunity for innovation which is being deployed already. Meanwhile, nations across the world, whether in Europe or in Asia, in China, in particular, are pulling out all the stops to see that they too can lead in this rapidly growing technological field.

Senator CARPER. Thanks. Hold it right there. Hold it right there. Hold it right there. I am running out of time.

My wife and I went to an Aspen Institute seminar back in August in Norway. Norway has the fifth or sixth largest gas and oil reserves in the world. They also have 40 percent of their vehicles now are powered by electricity. Forty percent are powered by electricity.

A year earlier I went to an Aspen Institute seminar in China and had the opportunity there to see the incredible investments that China is making in electric vehicles; large buses, cars, trucks, and the infrastructure to support them.

Ford and GM just announced last month that they are going to be launching 23 new models of electric vehicles in this country, I think by 2025. This is coming. This is coming, and they are going to need to be powered somehow. They can be powered by utility powers creating electricity. It could be coal, it could be natural gas, it could be clean coal, I hope. It could be renewables as well. There is a way to do this and do this in a smart way.

Senator BARRASSO. Senator Inhofe.

Senator INHOFE. Thank you, Mr. Chairman.

I have to say one thing in response. They always end up talking here about the great Paris Agreement. If there was ever a joke, that is it. You know, they have been trying for 21 years to get 192 countries, 196 countries to agree on something that they all agree on; and when I have talked to those individuals, and I have been at some of these meetings, they are there lining up to see who can get the most money out of the system.

Now, this great Paris Agreement that took place, what did we commit to in our country? President Obama said we will reduce CO_2 emissions by 27 percent by 2025. Now, I was Chairman of the Committee at that time. We called his own EPA and said we want you to come in and testify and tell us how you are going to cut these emissions. They refused to do it. I have never seen a time when someone in the jurisdiction of a Committee refused to testify. And the reason was that they couldn't do it.

What did other people agree to? India. India said, yes, we will agree that if we get somewhere between $1 trillion and $2.5 trillion, we will start doing something about emissions.

China. China, right now, every 10 days comes out with a new coal fired energy plant, generating plant, and they said we will continue to do that until 2025, then we will consider doing something of a reduction. When 2025 comes, no one is going to remember.

But I would just like to remind people that they have tried for 21 years, and this is the best they can come up with.

Now, Mr. Eisenberg, I want to mention something. Some good things are happening right now. I mean, look at the economy.

There is an article in this morning's Wall Street Journal that I want to make, Mr. Chairman, a matter of the record here. I will just quote one or two sentences here. "U.S. manufacturers have added 156,000 workers since Donald Trump was elected President in November 2016, according to the government data. That is a clear turnaround from the loss of 16,000 jobs during the final year of Barack Obama's administration."

I ask unanimous consent this be made a part of the record.

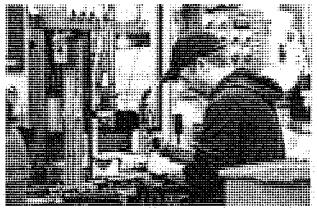
Senator BARRASSO. Without objection.

[The referenced information follows:]

BUSINESS

U.S. Manufacturing Rides Rising Tide, Buoyed by Global Growth, Optimism

Makers of everything from bulldozers to food products are on an upswing as production, spending and sentiment improve



A Wahl Clipper assembler working at the company's plant in Sterling, Ill., on Oct. 30. PHOTO: ALEX T. PASCHAL/ASSOCIATED PRESS

By Andrew Tangel and Josh Zumbrun
Updated Nov. 14, 2017 2:45 p.m. ET

American manufacturing has picked up pace over the last 12 months thanks to steady global economic growth, a rise in energy and other commodity prices, and increased business confidence.

Although progress isn't being felt by all industries, makers of items ranging from bulldozers to semiconductors to food products are on the upswing as various measures of spending, sentiment and employment have climbed, while stock markets have hit record highs.

The sector "absolutely has improved relative to where we were a year ago," said William Strauss, a manufacturing economist at the Federal Reserve Bank of Chicago, who described the growth as modest.

Employment numbers point to the overall progress. The U.S. manufacturers have added 156,000 workers since Donald Trump was elected president in November 2016, according to government data.

That is a clear turnaround from the loss of 16,000 such jobs during the final year of Barack Obama's administration, although the recent growth hasn't surpassed manufacturing payroll increases in 2011 and 2014, when the sector gained more than 200,000 jobs.

RELATED

- Household Debt Hits a New High
- Producer Prices Jump, Signaling More Inflation
- Ex-Pimco CEO Is Candidate for Fed Vice Chair

Also, business investment has risen, a sign companies are spending to increase productivity. In the first quarter, investment in plants climbed a seasonally adjusted annual rate of 14.8%, the highest since early 2014. Investment in equipment climbed 8.8% in the second quarter, the highest in almost two years.

A confluence of factors is helping manufacturing, according to Stanley Black & Decker Inc. Chief Executive James Loree, who cited a shrinking wage differential between U.S. and foreign workers and rapid technological advances in the sector. In his particular business, "end users love locally made products," Mr. Loree added in an interview on Tuesday.

"Global macroeconomic conditions are solid," Rockwell Automation Inc. Chief Executive Blake Moret told analysts, citing "strong orders" and optimistic forecasts for global economic growth and industrial production.

Winners and Losers

Changes in manufacturing from October 2016 to September 2017

Sectors with biggest job gains

Machinery	8.8%
Fruit/vegetable preservation	7.6
Lighting	7.1
Hand tools	6.7
Fabricated metal	5.9
Confectionary	5.8
Iron, steel mills	5.6
Purchased steel products	4.8
Mineral products	4.6
Machine shops	4.0

Sectors with biggest job losses

-9.9%	Cut and sew apparel
-7.[illegible]	Other apparel
-5.[illegible]	Misc. computer, electronic
-3.[illegible]	HVAC, refrigeration
-3.[illegible]	Fabric mills
-2.[illegible]	Motor vehicles
-1.[illegible]	Cleaning compounds
-1.[illegible]	Textile and fabric finishing
-1.[illegible]	Sawmills
-1.[illegible]	Paints, adhesives

Source: Bureau of Labor Statistics

Milwaukee-based Rockwell, which sells factory hardware and software to myriad manufacturers around the world, said last week it expects organic sales growth as high as 6.5% in its 2018 fiscal year, with an additional 2.5% boost to its results coming from a weaker dollar.

Global energy and commodity prices have rebounded amid growth in many economies around the world. That has boosted sales for Illinois-based manufacturing giant Caterpillar Inc. and other makers of heavy machinery used to extract natural resources.

In the process, Caterpillar has increased its domestic workforce by 3,200 from the end of March to 49,700 at the end of September.

"The overall environment is more business-friendly and we think that has created some business confidence," Caterpillar finance chief Brad Halverson said in an interview.

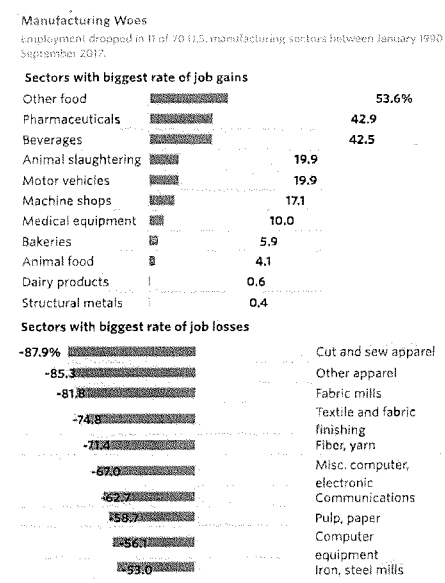
Part of the optimism stemmed from the election of a businessman as president last November and Mr. Trump's promise of reduced taxes and fewer regulations.

The gains have happened even though important parts of Mr. Trump's manufacturing agenda haven't come to fruition, observers and business leaders say.

Early in his term, Mr. Trump promised to punish American companies that shift production abroad, but such penalties haven't materialized. Also, advisory panels that included top manufacturing and other executives disbanded after Mr. Trump made controversial comments about racial tensions in Charlottesville, Va.

A big item, the overhaul of U.S. taxes, is being debated in Congress. But a $1 trillion infrastructure plan hasn't panned out. Nor has repeal of the Obama-era health-care law.

"We believe the lack of progress over key elements of federal policies—specifically health care, tax reform, and infrastructure funding—continues to exert downward



pressure on both public and private construction activity," C. Howard Nye, chief executive of North Carolina-based Martin Marietta Materials Inc. said in an analyst call on Nov. 2.

Gary Cohn, the president's top economic adviser, said Tuesday that a plan to overhaul the nation's infrastructure is "the next thing on our agenda."

Amid general improvement for manufacturing, some industries and companies have posted significant gains while others have continued to struggle. Among 70 manufacturing sub-industries tracked by the Labor Department, 19 have seen robust employment increases of 2.5% or more since October 2016, the month before the election.

But over that same period, 22 industries have seen employment decline, including aerospace and manufacturing of motor vehicles and parts.

The performance of America's largest manufacturing companies also has been mixed. Of the 10 largest industrial companies in the S&P 500, only Caterpillar, Honeywell Inc. and 3M Co. recorded higher third-quarter profit and earnings per share compared with a year earlier, according to data from Thomson Reuters I/B/E/S.

Profit and earnings per share declined at General Electric Co. , Boeing Co. , United Technologies Corp. , Lockheed Martin Corp. and General Dynamics Corp. Two companies-- United Parcel Service Inc. and Union Pacific Corp. --posted a rise in per-share earnings while their overall profit slipped.

To be sure, manufacturing growth could again slow if the economy tips into recession or

Harley-Davidson CEO Matt Levatich says the Trump administration has brought a welcome spotlight to manufacturing.
PHOTO: BLOOMBERG

if there are disruptions in trade or other geopolitical problems. A weaker dollar—which has boosted exports by making American goods cheaper abroad—could reverse direction. Those factors could further buffet the sector, which has experienced long-term declines in employment fueled by automation and shifting of production abroad.

Still, many business leaders remain hopeful Mr. Trump can deliver an infrastructure-spending plan and trade measures that benefit domestic manufacturers.

Harley-Davidson Inc. Chief Executive Matt Levatich credits Mr. Trump's administration with turning a welcome spotlight on manufacturing and skilled trades.

"It hasn't yet really accrued into any specific policies, but we're optimistic that just the attention and the awareness will help shift people's mind-set about the role of manufacturing," Mr. Levatich said in an interview.

American corporate chiefs and other observers see the administration's actions to roll back federal regulations—an agenda that has moved ahead with less public fanfare—as likely to help in the long term.

The Trump administration, according to Mr. Loree, has provided the "icing on the cake" for the sector via its deregulatory efforts and its general pro-business approach.

"It's a moment in time when it's all coming together," the Stanley Black & Decker CEO said.

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Appeared in the November 15, 2017, print edition as 'American Industry Picks Up Steam.'

Senator INHOFE. Also, the other thing, I have personal experience in this because I was a builder and developer for 20, 25 years, and I was doing things, making the sacrifices, building, expanding the tax base, making money, losing money, and all that. But the chief opponent I had, or opposition I had all that time was the Federal Government. So, I want to make this a part of the record, too.

One of the great things this President has done is all the CRAs, Congressional Review Acts, and I am proud that mine was the first one that had a signing ceremony, and that was the one where Obama had come out with a rule that said if you are competing here in oil and gas domestically, in the United States, with China or other countries, you have to give them all the information out of your playbook, putting us in a competitive disadvantage.

So, I introduced a CRA. It passed overwhelmingly, and the President signed it.

And I want to make this a part of the record also, because I have some 70 rules and regulations that have caused our energy economy to start turning around.

Senator BARRASSO. Without objection.

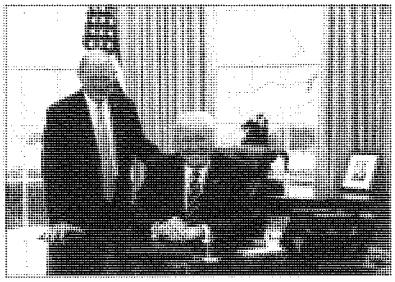
[The referenced information follows:]

James M. Inhofe

U.S. SENATOR • OKLAHOMA

www.inhofe.senate.gov

Congressional Review Act Resolutions Passed

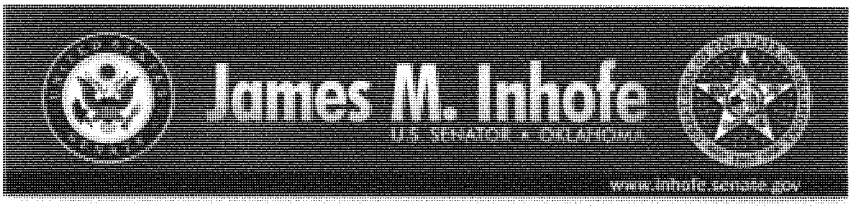


1. SEC Rule requiring oil and gas companies to disclose their "playbooks" on how to win deals. Inhofe CRA– first signed since 2001.
2. Stream Buffer Zone rule that blocks coal mining.
3. Education rule mandating federal standards for evaluating teacher performance.
4. Education rule establishing national school board.
5. Interior rule that blocked Alaska-control of hunting & fishing.
6. Social Security rule that put seniors with "representative payees" on gun-ban list.
7. OSHA rule that changed paperwork violation statute of limitations from 6-months to 5-years.
8. Defense rule that blocked contractors from getting deals if suspected (not convicted) of employment- law violations.
9. Labor rule blocking drug-testing of unemployment beneficiaries
10. BLM rule blocking oil and gas development on federal lands.
11. Federal Communications Commission rule that would have established 2nd regime of privacy rules in addition to Federal Trade Commission
12. HHS rule that would make it easier for states to fund Planned Parenthood
13. Department of Labor (DOL) rule forcing private sector employees onto government run retirement plans
14. DOL rule allowing states to bypass protections on retirement plans
15. CFPB Arbitration Rule

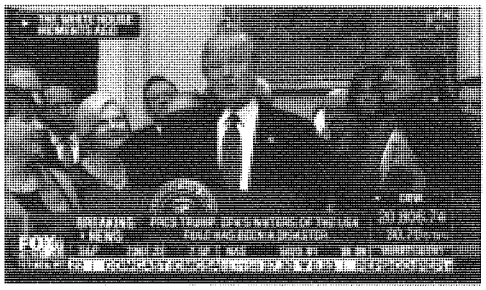
Note: the 15 CRAs are estimated to save the American taxpayers $3.7 billion. Inhofe's revoking SEC rule for oil and gas companies will save almost $1.3 billion.

Trump Executive Actions

1. Regulatory reform: requires 2 regulations be repealed for each new regulation.
2. WOTUS: directs EPA to rescind Waters of the United States Act.
3. Energy: repeals clean power plan, other harmful regulations…ending War on Fossil Fuels.
4. Mexico City: reinstates ban of fed funds going to NGOs that do abortions
5. Hiring Freeze: freezes federal hiring (exempted military)
6. Military: rebuilds military
7. Approves Keystone XL pipeline
8. Approves Dakota Access pipeline
9. Permit Streamlining: expedites infrastructure and manufacturing project permits
10. Immigration: 90 day suspension on visas for visitors from Syria, Iran, Libya, Somalia, Sudan, Yemen. 20 day suspension of U.S. Refugee Admission Program
11. Sanctuary Cities: blocks federal Department of Justice grants to sanctuary cities.
12. Dodd-Frank: demands review of Dodd-Frank banking regulations and demanding roll-back.
13. Shrink government: directs federal agencies to reorganize to reduce waste and duplication.
14. Trade: evaluates policies to reduce trade deficit.



15. Opioids: fed task force to address opioid drug crisis.
16. Fiduciary rule: delays implementation of bad DOL rule
17. Religious Liberty: Eases enforcement of Johnson Amendment and grants other protections for religious freedom.
18. Offshore drilling: revises Obama-era offshore drilling restrictions and orders a review of limits on drilling locations.
19. National Monuments: Directs a review of national monument designations.
20. Improves accountability and whistleblower protections for VA employees
21. Affirms local control of school policies and examines Department of Ed regulations
22. Reviews agricultural regulations
23. Reviews use of H-1B visas
24. Top-to-bottom audit of Executive Branch
25. Moves Historically Black Colleges and Universities offices from Department of Ed to White House
26. Obamacare: directs federal agencies to ease burdens of ACA.
27. Establishes American Technology Council
28. Establishes office of Trade and Manufacturing Policy
29. Identifies and reduces tax regulatory burdens
30. "Hire America, Buy America"
31. Establishes a collection and enforcement of antidumping and countervailing duties and violations of Trade and Customs laws
32. Creates an order of succession within DOJ
33. Revokes federal contracting executive orders
34. Establishes Presidential Advisory Commission on Election Integrity
35. Reforms education and workforce programs and expands apprenticeship opportunities
36. Updates visa and foreign visitor implementation plans through DHS and State Department
37. Strengthens cybersecurity for federal networks and critical information technology infrastructure
38. Revives National Space Council
39. Extends actions against Sudan to October
40. Establishes presidential advisory council on infrastructure at Department of Commerce
41. Strengthens domestic manufacturing and defense industrial base
42. Issues additional streamlining and accountability in the environmental review and permitting process for all infrastructure projects – also revokes Obama flood risk management standard order
43. Imposes new sanctions on Venezuela
44. Revokes Obama order that prohibited state, local, and tribal law enforcement entities from accessing federal response equipment
45. Prohibits acquisitions by China entities of a semiconductor company for national security reasons.
46. Trade: widens trade sanctions on North Korea
47. Committees: continuing certain Federal Advisory Committees
48. Revokes Obama order that created labor-management forums
49. Promotes healthcare choice and competition across the United States
50. Provides the Secretary of Defense additional authority to manage personnel requirements
51. Resumes the United States Refugee Admissions Program with Enhanced Vetting Capabilities



Senator INHOFE. So, I just want to observe, Mr. Eisenberg, all the things that are happening right now. You know, the second and third quarter of this year, we have increased the economy by 3 percent. In the first quarter, of course, that was the previous Administration, it was 1.6 percent. And that is a huge thing. Right now we are talking about what can we do to increase the revenues that come into the United States, and one of the best ways is to increase our GDP, and that is exactly what we are doing.

So I would say, Mr. Eisenberg, there is not time for a question from you, but I would only say that good news, good things are happening right now, and I think your testimony has made that real clear.

I want to say one thing, however, Mr. Coddington, because Harold Hamm—do you know who Harold Hamm is?

Mr. CODDINGTON. Yes, I do.

Senator INHOFE. All right. Harold Hamm, for those who don't know, is the Executive Director of the International Energy Agency, and he said yesterday, "The United States will become the undisputed global oil and gas leader for decades to come. The growth and production is unprecedented, exceeding all historic records." Harold Hamm, by the way, is from Oklahoma. He has the Continental Resources, and he is even, right now, exporting oil to China, of all things.

So good things are happening, and I have no questions. Thank you, Mr. Chairman.

Senator BARRASSO. Thank you, Senator Inhofe.

Senator Whitehouse.

Senator WHITEHOUSE. Thank you.

First, Mr. Chairman, let me say I hope that the hearing becomes an encouragement for the bill that you and I have worked on, the Carbon Capture, Utilization, and Storage Act. I think that there is significant technological opportunity to be achieved in that space, but it is rather hard to achieve technological opportunity in a space in which there is no value proposition to the investor. And as long as there is no price on carbon, the corollary of that is that there is no benefit to low carbon, so it gets really hard to find a way to achieve revenues for offering a carbon capture technology. There have been some grants that have allowed experimental projects to proceed, and where you are near an oilfield, there is, like up in Saskatchewan, the ability to try to find a revenue stream from pressurizing the oilfield. But not every coal plant is located geographically near an oilfield where that revenue stream is even a possibility.

So I think we have the opportunity in this bill to at least create a window of a revenue stream to support that, and I hope we will continue to move forward with that bipartisan legislation.

As long as we have you here, Mr. Eisenberg, could you tell me what the position is of the National Association of Manufacturers on climate change? I haven't been able to find anything on your Web site since the 2009 statement of the 80 different hurdles that any legislation or program would have to pass before you could support it, which didn't even seem consistent with one another.

Mr. EISENBERG. Absolutely.

Senator WHITEHOUSE. Is there a current position since 2009?

Mr. EISENBERG. Absolutely.

Senator WHITEHOUSE. What is that?

Mr. EISENBERG. And I will direct you to the part of the Web site that does state it. We believe that we should be acting on climate, period. Manufacturers are increasingly doing it, you know, across the board. Manufacturers are taking matters in their own hands because their investors are demanding it, their customers are demanding it, their employees are demanding it, and they are doing it. So we absolutely believe that we should be acting on climate change——

Senator WHITEHOUSE. And you opposed the Clean Power Plan, correct?

Mr. EISENBERG. We did oppose the Clean Power Plan. We are asking the EPA to replace it with a better regulation. So we are comfortable with regulation——

Senator WHITEHOUSE. Is there an example that you have of a better regulation, or is that just kind of a hypothetical better regulation out there in space?

Mr. EISENBERG. Sir, we are not the ones writing it, but yes, we are going to have some ideas on what that should look like. I think under 111——

Senator WHITEHOUSE. But you don't have a proposal?

Mr. EISENBERG. So we have not put forward our proposal yet. In some of the Clean Power Plan comments we did actually submit plenty of suggestions on how they could sort of fix that proposal. Frankly, 150 pages of suggestions. Some of them were taken; some of them were not. But yes, there are things you could do within the confines of 111 that I think would probably hold up under law and would be effective in reducing emissions.

Our concern on that, quite frankly, was not just the power sector, but the sort of follow on effect, since that is a precursor to rules on the industrial sector as well.

Senator WHITEHOUSE. I guess I would just close by saying I am glad that you are, as an organization, supporting taking action on climate change. I gather you wouldn't support that if you didn't concede that this is a real problem that America needs to address. And I gave remarks a little while ago on the Senate floor about some of our universities that seem to agree very strongly on this, and I pick out particularly, because their States are here represented today, the University of Wyoming and the University of West Virginia.

The University of Wyoming Center for Environmental Hydrology and Geophysics says many of the most pressing issues facing the western United States hinge on the fate and transport of water and its response to diverse disturbances, including climate change. University of Wyoming scientists publish articles on the effects of projected climate change on forest fires, sustainability. The University of Wyoming awards grants to study the effects of climate change on pollinators, on water flow, on beaver habitat, on white bark pine growth. All of this work is going on, I think, in good faith in recognizing that climate change is very serious.

In West Virginia, the Mountain Hydrology Laboratory tells us that climate change has important implications for management of freshwater resources; that the Highlands Region in the central Ap-

palachian Mountains is expected to "wet up"; that as warmer air, which carries more moisture, leads to what West Virginia University is calling the intensification of the water cycle, which is a nice way of saying storms and floods, that laboratory warns that the implications of this intensification are immense. And indeed, West Virginia University's climate scientist, Professor Hessel, was recognized by West Virginia University as West Virginia University's Benedum Distinguished Scholar. So not very likely that climate change is treated as a hoax in West Virginia when the West Virginia University Benedum Distinguished Scholar teaches climate science.

Thank you very much.

Senator BARRASSO. Thank you, Senator Whitehouse.

Senator CARPER. Mr. Chairman, I ask for unanimous consent, if I could make a unanimous consent request, to submit for the record testimony refuting concerns mentioned about New Source Review. These concerns have been voiced for decades. As Mr. Eisenberg stated, clean investments are being made. New Source Review makes sure the overall emissions do not increase so we don't clean up our pollutants by increasing emissions of another.

Thank you.

Senator BARRASSO. Without objection.

[The referenced information follows:]

Mary Gustanski
Vice President of Engineering, Delphi
Statement for the Record – November 15, 2017
Promoting American Leadership in Reducing Air Emissions through Innovation

Thank you, Chairman Barrasso, Ranking Member Carper, and Members of the Committee on Environment and Public Works for giving me the opportunity to submit testimony on behalf of Delphi.

My name is Mary Gustanski and I currently serve as the Vice President of Engineering for Delphi. Delphi is a high-technology company that integrates safer, greener and more connected solutions for the automotive sector. We invest more than $1.7 billion annually into engineering development initiatives. In the U.S., Delphi operates major manufacturing facilities, technical centers, and/or administrative facilities in California, Michigan, Ohio, Indiana, New York, Pennsylvania, Massachusetts, Mississippi and Texas that employ approximately 5,000 people. Delphi's technology portfolio places it at the center of vehicle evolution and innovation, making products smarter and safer as well as more powerful and efficient.

Given our proven expertise with market-leading original equipment manufacturers (OEMs) around the world and our broad automotive systems capabilities, we welcome the invitation to provide the Committee with testimony on opportunities to reduce air emissions through the development of new technologies.

Delphi's Focus on Innovation

The automotive industry is facing some of the most dramatic changes ever to impact transportation. In order to stay successful, Delphi and the industry as a whole must understand and comply with the desires and emotions of the vehicle purchasers and operators, the 'interfacers' such as pedestrians and so much more in addition to compliance with the regulations.

The convergence of safe, green & connected is enabling future vehicle solutions. The connected car is now an expectation of the average consumer, and consumers are also demanding the active safety features that serve as the foundation for automated driving. Delphi is also driving advancements in propulsion, including the best value electrification. To achieve our vision of continuing to innovate our comprehensive portfolio to deliver future safe, green & connected systems, Delphi employs 20,000 scientists and engineers across 15 major technical centers in order to continue introducing industry leading technologies.

Delphi has recently announced that the company will create two separate entities that will allow each company to intently focus and optimize its individual area of engineering expertise while maximizing opportunities to provide customers with the best in advanced technologies in the auto industry today. The spin-off entity, which will be known as Delphi Technologies, will

continue to be a leader within the propulsion segment focused on continued innovation in combustion, electrification and software and controls to enable the optimal path to electrification.

The Path to Electrification. Closing Fuel/CO2 regulation gaps with 48 Volt Mild Hybrid.

Automakers are growing more bullish about the electrification of powertrains by adding hybrid technology to vehicles with internal combustion engines - and for good reason. With future regulations of 95g CO2/km in Europe and 54.5MPG in the United States by 2021 and 2025, respectively, there is immense pressure on the industry to meet these requirements.

Improvements in internal combustion engines have helped close the gap to regulatory targets. Technologies like gasoline direct injection (GDi), variable valve actuation, and common rail diesel have had a significant impact in reducing emissions, and improving fuel economy – and they will continue to do so. Despite this progress, however, the industry still has a big gap to close.

We know electrification allows further engine downsizing by providing more power for intelligent driving. But, to get to these targets, the path there has to be affordable and without the drawbacks that have kept solutions like full hybrids and electric vehicles from selling; cost, range anxiety, lower fuel prices, and performance issues. Because of these drawbacks, analysts predict less than 5% of all vehicle sales will be electric by 2025.

What does this mean?

It means there is a substantial portion of the market that can be electrified using hybrid technology in order to further improve emission and fuel economy.

Delphi's Innovation in Propulsion – the 48 Volt Vehicle

Recognizing that one powertrain type will not satisfy all regions on all segments in the foreseeable future, Delphi is working to expand the range of solutions for diesel and gas engines, to improve the cost/benefit ratio. Delphi provides systems expertise to integrate and optimize engine performance. This systems expertise is more in demand than ever, especially in markets like China.

Delphi last year introduced 48-volt, mild hybrid technology to help automakers achieve global fuel economy and CO2 regulations without trading off vehicle performance. Delphi's system offers 25 percent more torque of a 12-volt, stop-start while delivering >10% CO2 reduction. At four times the power of a 12-volt system, this solution will provide automakers ample room to innovate without moving up to a bigger engine to get more power. Delphi's solution adapts the

vehicle architecture to a mild hybrid architecture efficiently, enabling a best value electrification system.

The latest Institute for Highway Safety (IHS) forecast projects over 19M 48-volt systems to be sold by 2025, from zero today. About 18 percent of vehicles produced in 2025 will be 48-volt powered, which makes 48-volt, mild hybrids the best value and most logical solution to help the industry hit f/e and CO2 targets.

The beauty of 48-volt is there is no trade-off of power and performance like there is with today's 12-volt, start-stop systems.

Many of today's hybrids use 12-volt, stop-start systems that shut off the engine when stopped at a light. But this type of system lacks power when pulling away at a light leaving consumers feeling underwhelmed. To overcome this sluggishness, Delphi's 48-volt, mild-hybrid system enables seamless start. This makes 48-volt, mild hybrids a logical bridge from 12-volt, stop-start to full hybrids. It essentially enables consumer familiarity with electrification while offering an easier transition step for automakers.

Complementing mild hybrid technology is the latest advanced combustion technique enabling variable valve actuation; a strategy that adjusts cylinder actuation to match the power demand. Delphi is now working on a system that marries 48-volt with Dynamic Skip Fire (DSF)—this unique technology leverages software to balance the number of cylinders the engine needs to fire based on throttle demand. Like 48-volt, DSF does not sacrifice performance for efficiency. No longer does your engine need to operate with a fixed number of cylinders. Our Silicon Valley partner, Tula, has essentially optimized an algorithm that enables a continuously variable-sized engine. It can work on any combination of zero up to eight cylinders.

Combining the two technologies, extends the operating range of both, and has the potential to deliver 20% more fuel efficiency for a fraction of the cost of other solutions.

The 48 Volt Vehicle—A Win-Win

Car buyers will buy 48-volt, mild hybrids for the added performance and car companies will offer the technology because it gives them a faster and more affordable path to hitting these targets. It's a win-win for everyone.

Senator BARRASSO. Senator Capito.

Senator CAPITO. Thank you, Mr. Chairman.

Thank all of you for being here today.

I am going to start with Mr. Coddington, but I am going to make a couple of comments. I am also a co-sponsor of the clean coal bipartisan effort to move forward with the technologies, bring value to that, and spur that along through a 45Q tax credit. We have great stakeholders in that participating, from environmentalists to coal companies, so I think it shows a path forward.

I would also say, in conversation about electric cars, I am all in favor and very excited about the technologies that we see. But remember they have to be powered by electricity at some point, and they have to be plugged in, and what that says to me, as a coal State representative, is you need that good baseload energy resource to be able to power electric cars.

So we can move toward emission free on the automobile side, but we have to keep moving forward on the coal side, because coal is going to be needed to power those electric cars. That is just simply going to be a fact, I think, of the future of our transportation system.

As Senator Whitehouse mentioned, West Virginia University is doing great research in this area, but we also have Longview Power Plant, which is the highest efficiency, lowest emission plant in the country, and they are struggling. They are struggling because the economic model here in this country to deploy the cutting edge emission and dual fuel capacity and regulatory pressures has made it difficult for them.

In the meantime, the President just returned from China. We see China building supercritical plants and moving forward not just with the buildout, but with the technology that it takes to build these kinds of plants. You can't build that in the United States right now in this environment, because of the expense and because of the difficulties and the headwinds that coal faces.

So I would ask, Mr. Coddington, where do you see the future of supercritical coal plants in this country? Can we get there or is China going to continue to eat our lunch in this aspect?

Mr. CODDINGTON. Senator Capito, I do have great confidence in ultra-supercritical combustion technologies. I actually think if the regulatory environment is right, that you may see some of those plants start to come in the United States.

In conjunction with our colleagues at West Virginia University and University of Kentucky, we actually are doing a lot of clean coal projects both in China and in the United States under the U.S.-China Clean Energy Research Center. So I am very optimistic about that technology. When you look at pathways forward for clean coal, certainly the more efficient combustion of it would have to rank among some of the most optimistic technologies that you could employ at scale. I think one of the main issues in the United States is competition between coal and gas, so there are economic considerations there that can't be overlooked. But I am quite optimistic about ultra-supercritical coal.

Senator CAPITO. Well, you kind of threw a big if in there: if the regulatory environment is suitable. How would you describe it at this point in time right now? Are we suitable for the development

of that; are we moving toward that, or are we moving away from it?

Mr. CODDINGTON. Senator Capito, again, I am not a particular expert in this field, but my impression is, under the Clean Power Plan and the Section 111(b) rules, that there was a preference toward carbon capture and storage, if you will, as opposed to maybe the deployment of ultra-supercritical technologies, and I say that as a carbon capture and storage fan. I was looking for incentives for carbon capture and storage in funding. But I would think in an appropriate policy and regulatory environment that there should not be a reason why those plants could not be encouraged to be built, as long as the economics otherwise penciled in light of the market prices for shale gas.

Senator CAPITO. Thank you.

Mr. Eisenberg, we have talked a lot about carbon and carbon emissions. We have had several hearings on ozone and the ozone related regulations, and some of the difficulties that some areas of our country are having to meet a standard before they have met the standard before.

What are your manufacturers telling you about trying to meet the standards here? I would just like to hear your comments on that.

Mr. EISENBERG. Thank you, and thank you for your leadership in trying to address this issue legislatively. We still need relief. We actually went out to our members and asked for input, heading into this year, on what their biggest regulatory concerns were, and ozone is still at the top. They are struggling with having to implement this regulation and comply with it. It gets to the margins of technologies that they frankly just don't know how to deploy.

One of the charts I put in here, actually, a couple of the charts I put in my testimony are on NO_x and VOCs, and you can see, on NO_x, for instance, we are about 15 to 25 percent of all the total NO_x emissions that come from the manufacturing sector. Yet that regulation basically requires all of the relief to come from us. So you kind of get a sense of why we are so frustrated here. We have done a lot already. We are running out of things to do, and we are still feeling the pain of this regulation and could really use relief, and thank you for all the work on it.

Senator CAPITO. Thank you very much.

Senator BARRASSO. Thank you, Senator Capito.

Senator Boozman.

Senator BOOZMAN. Thank you, Mr. Chairman.

Mr. Eisenberg, a common complaint I hear from industry in Arkansas about the previous Administration, really, I think, Administrations in general, is the gotcha attitude from Federal agencies. Instead of working hand in hand with the industry to develop regulations that help the environment and foster economic growth, many felt that they didn't have a place at the table. Then when regulations and unfunded mandates were released, industry were expected to hit thresholds that were impossible to reach. This usually ended with the Federal Government stifling economic growth, while providing few, if any, environmental benefits. Further, many regulations developed during the previous Administration were litigated, wasting the Federal Government's time and money.

In your opinion, does an open and transparent dialogue with industry help the Federal Government develop sound regulations? More specifically, can this lead to smoother implementation?

Mr. EISENBERG. So, thank you for that.

Senator BOOZMAN. Really important.

Mr. EISENBERG. I strongly believe that there needs to be improved communication and trust between the business community, the regulated community, which is essentially manufacturing, and the Federal Government. And you can see it in the vehicle space that my colleague from the BlueGreen Alliance spent a lot of time talking about.

For some reason, we are able to do it in the vehicle sector, where the agency got together with the equipment manufacturers, the tier 1 suppliers, and figured out a path forward that was aggressive, it worked, and everybody was able to kind of live with it and create jobs. You see it in the trucking space; you see it in the aviation space.

We weren't able to do that on a lot of these sort of core environmental air pollution issues in the stationary source side, the power plant side, the manufacturing plant side. Our hope is that we can get there. There are some programs that EPA is putting in place. They resurrected something called the Smart Sectors Program where there are dedicated employees who are working with each individual sector of the manufacturing economy and trying to foster better communication, better trust, and I do think that is the way to get there.

We all want the same thing here. We are all trying to keep those trend lines on emissions going straight down. And I think there is a way to do it right and a way to not do it right, and hopefully we are headed toward a better path.

Senator BOOZMAN. Ms. Lipman, do you want to comment?

Ms. LIPMAN. I would actually second a lot of that in the sense that I do think the vehicle sector provides an example of the importance of engaging all stakeholders who have a key stake in the outcome of regulations, both in the regulated industry, as well as labor, environmental interests, community interests, et cetera. And I think there is tremendous potential to get to solutions that work for everyone.

I think one thing that we have talked about here is the tremendous innovation happening. I do think we need to ensure that we have the leading standards and the sort of certainty and vision for companies to be able to make the investments to actually deploy some of these technologies, whether it is CCS or nuclear or advanced wind, you name it. I think in the electric sector we have seen a situation where all of those require a long term sense of where are we going in order for the investments to flow to deployment. So, whether we are looking at Paris or whether we are looking at economy-wide solutions, climate change, we need to retain a signal and a leadership, or we are not going to see these variety of technologies across. And we would agree that the span, the full range of energy and transportation technologies are solutions, but we need a shared commitment and clear regulatory pathway to get there.

Senator BOOZMAN. Thank you.

Mr. Coddington, about 40 percent of Arkansas's electricity is sourced from coal. The State's legislature and the Arkansas Oil and Gas Commission have coordinated to set up a permitting process for enhanced oil recovery injection wells. The oil and natural gas production renaissance of the last 10 years has occurred on public and private lands, with the Federal Government slow to adapt to new technologies. It seems that States are leading on enhanced oil recovery as well.

What can we, as Federal policymakers, do to help facilitate the deployment of carbon capture and enhanced oil recovery technologies?

Mr. CODDINGTON. Senator Boozman, thank you for your question. First, I would like to commend the Committee for its work on 45Q, which has bipartisan support. Certainly, anything that can be done to incentivize the capture of carbon dioxide and utilizing it in enhanced oil recovery, or injecting it for deep saline storage, is to be commended, and we are very thankful for that.

If you look at the existing markets for CO_2, the biggest one is enhanced oil recovery. Largely, that is a matter of State regulation. There are some issues with respect to the underground injection control code under the Safe Drinking Water Act regarding the regulatory status of carbon dioxide that is stored. So, for example, under current law, if I purchase carbon dioxide and inject it for enhanced oil recovery, and then it has to be stored, I am at risk of being tossed into a different regulatory program that could be problematic for me. So I would recommend perhaps taking a look at the underground injection control program and how that might work from the point of view of enhanced oil recovery. But largely, that is a matter of State regulation, and the State of Arkansas is to be commended for its work that it is doing in this area.

Thank you.

Senator BOOZMAN. Thank you.

Senator BARRASSO. Thank you, Senator Boozman.

Before turning to Senator Carper for a second round of questions, I ask unanimous consent to insert into the record a paper on New Source Review. This is a whitepaper explaining the barriers that New Source Review poses to fossil fuel-fired power plants that make efficiency improvements difficult. The paper was prepared by the Carbon Utilization Research Council.

And also unanimous consent to——

Senator CARPER. I object. Not really.

Senator BARRASSO. Hearing no objections, ask unanimous consent to place into the record written testimony by Cloud Peak Energy in support of innovative policies to reduce emissions and provide regulatory certainty. Cloud Peak is headquartered in Wyoming; it is one of the largest U.S. coal producers.

[The referenced information follows:]

CARBON UTILIZATION RESEARCH COUNCIL
ADVANCING FOSSIL ENERGY SOLUTIONS

New Source Review

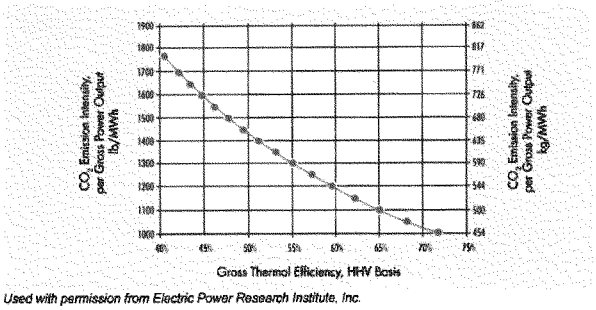
What is New Source Review (NSR)?

NSR is an air quality permitting program created by Congress in the 1977 amendments to the Clean Air Act (CAA). The purpose of NSR in 1977 was to require that best available pollution control technology be installed on new sources constructed in areas that are in attainment of national ambient air quality standards (NAAQS), and to require even better-performing pollution control technology in areas that are not in attainment of the NAAQS.

NSR requires major stationary sources to complete a rigorous pre-construction permitting review process to assess the need for environmental controls, and to receive an NSR construction permit, if they propose to build new facilities, or make "major modifications" to, existing facilities that would cause an emissions increase of certain regulated air pollutants. The EPA regulations to implement the 1977 legislation exempt "routine maintenance, repair and replacement" projects at existing sources from the NSR permit review process. However, the terms "routine maintenance, repair and replacement" are not defined and have been left to interpretation by EPA and state permitting authorities on a case-by-case basis. The inconsistencies and uncertainties in the application of NSR requirements has resulted in endless litigation by the EPA, public interest groups, and utilities. Additionally, EPA has adopted more stringent NAAQS standards since the NSR program was enacted, increasing the complexity for all sources including power generators operating within NSR program.

Efficiency improvements to existing fossil-fueled power plants both improves the operating costs to run the plant, as well as reduce emissions such as CO_2, because less fuel is used to produce each kilowatt-hour of electricity. The figure below shows how increased efficiency reduces a plant's CO_2 emissions.

Relationship between CO_2 emission intensity and gross thermal efficiency for a subbituminous coal power plant



Used with permission from Electric Power Research Institute, Inc.

But when the NSR program was enacted in 1977, CO_2 and other greenhouse gases (GHGs) were not regulated air pollutants under the CAA. Now, 40 years later, GHGs (including CO_2) are regulated under the CAA. In part because it was not designed with CO_2 in mind, the NSR program is counterproductive for achieving CO_2 emissions reductions at existing plants, as EPA has taken the position that projects designed to reduce CO_2 emissions, including efficiency improvements, can trigger NSR permitting requirements, making those projects prohibitively more expensive. For utilities, the NSR program has significantly discouraged the implementation of efficiency improvement projects as well as other routine maintenance, repair or replacement activities at existing coal plants.

What Triggers NSR?

There is a two-part test for determining whether a project at an existing major source triggers NSR permitting requirements:

(1) There must be a physical change or change in the method of operation of a facility that is not exempted by regulation from the NSR permitting program. Notable examples of such NSR exemptions include "routine maintenance, repair and replacement" projects and an increase in hours of operation or rate of production.
(2) If the modification being proposed is not a physical or operational change exempted from the regulation (as noted in (1) above), then a change to a facility that results in a "significant net emissions increase" above historic baseline actual emissions levels for any regulated air pollutant triggers an NSR permitting review for the project. The EPA regulations have detailed rules for calculating historic baseline emissions and future emissions after the project.

Some examples of changes to an existing electric generating unit have been included in complaints filed in NSR enforcement actions include:

- Improving the efficiency of an existing source through installation of new, more efficient replacement components such as turbine blading or higher efficiency motors and pumps;
- Adding control equipment to reduce emissions of one air pollutant that results in a collateral increase in another air pollutant, like installation of selective catalytic reactors to reduce NOx; or
- Undertaking routine component replacements which may include replacing or upgrading a piece of equipment to ensure the performance and reliability of a unit.

Uncertainty of What Triggers NSR

Although the NSR regulations state that routine maintenance does not need to undergo NSR permitting review, the terms "routine maintenance, repair and replacement" are not defined, and have been left to interpretation by EPA and state permitting authorities on a case-by-case basis. Notably, EPA has made determinations that particular projects that improve the reliability, efficiency, and safety of power plants are non-routine and are therefore subject to NSR.

EPA's regulations governing the calculation of emissions increases are also problematic. EPA's rules require a comparison between historic annual baseline emissions and highest projected annual

emissions during any one of the five years following the project. While efficiency improvement projects actually result in reduced emissions per unit of power produced, they could still trigger NSR requirements because the rules define an "emissions increase" in terms of the impact of the project on total annual tons of emissions, not the impact to the emission rate. While the regulations allow for exclusions due to factors unrelated to the change at the unit (examples include declining fuel costs, increases in customer demand, and other independent factors), EPA has claimed that efficiency improvements can result in an increase in annual emissions because the unit may be dispatched more frequently and operate at higher annual capacity levels after the efficiency improvement project is completed, and thus cause an increase in the total annual tons of emissions.

Despite years of litigation over EPA's determinations, these issues have never been fully resolved. This means power plant operators may avoid making efficiency improvements and undertaking maintenance projects at their facility for concern that such changes will be deemed a "modification" of the plant subject to NSR permitting requirements. Another impact of NSR is that if EPA determines a NSR permitting review is required, facility owners must undergo onerous requirements that can result in lengthy and costly permitting delays. And the EPA determination from the NSR permitting review process could result in EPA requirements for additional investments in new emission control technologies or other equipment in the facility.

This uncertainty has created a strong disincentive to undertake projects that can otherwise improve the efficiency and productivity of our existing coal plants which would result in reduced emissions of CO_2 from the existing fleet.

What are the NSR Permit Requirements?

The following is a brief summary of the major regulatory requirements that apply to facilities triggering NSR permit review:

Control Technology Requirements. For each pollutant with a "significant net increase" in emissions, NSR requires the installation of the most advanced and adequately demonstrated pollution control technologies that are currently available. If the plant already has pollution controls installed, NSR determination may require the plant to upgrade the performance of the existing technology. Specifically, if the plant is located in an areas meeting NAAQS standards ("attainment areas"), the source must install pollution control technologies meeting "best available control technology" considering cost and other factors, while a source located in areas not meeting such air quality standards ("nonattainment areas") must install control technology capable of achieving the "lowest achievable emission rate" without regard to cost. More specifically, if the plant operator was only seeking to perform maintenance on the plant, NSR can result in the plant operator being required to apply new control technologies and incur capital expenses that were not intended and whose financial impact may negatively impact the viability of the planned project.

Regional Air Quality Requirements:

The NSR program also establishes several major requirements to protect air quality. One key requirement is the performance of extensive air quality modeling (and/or ambient air quality monitoring) to demonstrate that the increased emissions from the modified source will not violate NAAQS, nor significantly degrade air quality in attainment areas.[1] If modeling shows the modification would result in these air quality impacts, then some type of mitigation will be necessary. This mitigation could require the source to achieve even more stringent emission controls or obtain offsetting emission reductions from other sources in the same air shed (emissions offsets).

In the case of modified sources located in areas not meeting NAAQS (referred to as nonattainment areas), NSR requires the source to obtain emissions offsets and demonstrate that there will be progress toward achievement of the NAAQS for any nonattainment air pollutant.

Each of these requirements could result in additional expenditures to a facility that would be an impediment to proceeding with the project, particularly if the expenditure for additional control equipment may not have been originally contemplated through a proposed maintenance or efficiency project.

[1] Another air quality requirement is that the performance of modeling that demonstrates that the source's increased emissions will not adversely impact visibility or other "air quality related values" in a national park.

CURC CARBON UTILIZATION RESEARCH COUNCIL
ADVANCING FOSSIL ENERGY SOLUTIONS

Mission Statement

The Carbon Utilization Research Council (CURC) is an industry coalition focused on technology solutions for the responsible use of our fossil energy resources in a balanced portfolio to support our nation's need for reliable and affordable energy. Created in 1998, CURC serves as an industry voice and advocate by identifying technology pathways that enable the nation to enjoy the benefits of abundant and low cost fossil fuels in a manner compatible with societal energy needs and goals.

About CURC

The strength of our coalition derives from the breadth of its membership, which includes fossil energy producers, electric utilities that rely upon coal and natural gas for electricity production, equipment manufacturers and technology innovators, national associations that represent the power generating industry, and state, university and technology research organizations.

CURC believes that future energy needs can be effectively met through collaborative public and private sector research to expand technology choices for private sector commercialization. Members of CURC work together to evaluate technology development needs, design appropriate research and development programs to enable those technology choices, and identify federal programs and policies that are needed to support this activity.

CURC engages in advocacy efforts with policymakers, NGOs and other stakeholders to ensure that development of advanced fossil energy technology options are an integral part of the larger national energy plan. Our successful track record is evidenced by three decades of fossil based electricity generation with significantly lower emissions per unit of energy used.

CURC has built a positive and non-partisan reputation before the U.S. Congress and throughout the Executive Branch as an informed organization that can be relied upon for useful fact-based technology information and policy ideas in support of our mission.

Written Testimony from Cloud Peak Energy for Senate EPW Hearing: "Promoting American Leadership in Reducing Air Emissions Through Innovation" November 15, 2017

It is the view of Cloud Peak Energy, one of the nation's largest coal producers, that Congress must support policies conducive to a long-term, innovation-led, regulatory and investment framework that balances the goals of economic growth and prosperity, addresses the legitimate concerns Americans have about emissions and climate, and ensures the American people continued energy security and affordability[i]. That future is currently at risk and, while the punitive, coercion-led policies imposed by the Obama administration are being rescinded, without support from Congress to ensure long-term innovation promotion and leadership to address these issues, dire consequences lie ahead.

A Proven Track Record of Success with the Innovate-then-Regulate Model, Now Broken and Abandoned

The history of emissions reductions from fixed sources and automobiles in the United States has been one of regulation following, and incentivizing, the innovation that has permitted and driven the very substantial cuts in a wide range of emissions over the past 50 years. Nowhere is this more true than in the case of coal fired power plant emissions. During the period 1970 through 2008, for example, coal use in power generation increased dramatically, by 183%, while key emissions from coal power plants declined by an aggregate of 82% to 96% [ii].

During that period, the Clean Air Act, and regulatory regimes developed under its authority, were built on the basis of the best available technology, and that technology continued to evolve and progress. "The Clean Power Plan" authored by the Obama administration, broke that model and, for the first time, instead of pursuing the successful innovate-then-regulate model, moved to a regulate-and-hope model. With the New Source Review and 111 (b) and (d) rules, the EPA essentially crafted a regulatory regime that was predicated on, and required compliance through, the deployment of technology neither fully developed nor available for commercial implementation.

Failure to adhere to the innovate then regulate approach, in tandem with the law of unintended consequences, can perhaps be best seen in the case of the New Source Review (NSR), which can be, and has acted as, an inhibitor to innovation in emissions reduction. NSR is an air quality permitting program created by Congress in the 1977 amendments to the Clean Air Act (CAA). The purpose of NSR in 1977 was to require that best *available* pollution control technology be installed on new sources constructed in areas that are in attainment of national ambient air quality standards (NAAQS), and to require even better-performing pollution control technology in areas that are not in attainment of the NAAQS. As written and intended in 1977, NSR was entirely compatible with the best practice innovate-then-regulate philosophy.

Yet, there enters the law of unintended consequences. When the NSR program was enacted in 1977, CO2 and other greenhouse gases (GHGs) were not regulated air pollutants under the CAA. Now, 40 years later, GHGs (including CO2) have been made subject to the CAA, even though Congress has not amended the Clean Air Act with that explicit intent, and the use of NSR vis-à-vis GHGs is proving counterproductive. In part because it was not designed with CO2 in mind, the NSR program is actually inhibiting CO2 emissions reductions at existing plants, as EPA has taken the position that projects designed to reduce CO2 emissions,

including efficiency improvements, can trigger NSR permitting requirements, making those projects prohibitively more expensive. For utilities, the NSR program has significantly discouraged the implementation of efficiency improvement projects as well as other routine maintenance, repair, or replacement activities at existing coal plants. Thus, NSR currently stands in the way of innovations that would reduce CO2 emissions and must be reformed. NSR reform is an important part of the legislative action required by Congress.

All Stick and No Carrot Makes Innovation Harder.

Furthermore, in recent years, the proven success of innovation and incentive driven regulation has been ignored in certain corners. There, strong advocates for replacing the carrot with a very heavy stick, in the form of punitive regulation of various types, and of carbon taxes, are hard at work. Instead of using tax incentives to reward innovation and technology deployment, this new philosophy seeks to use the coercive power of the federal government and tax policy to enforce CO2 avoidance in ways that will almost certainly stifle innovation. In the context of, for example, power plant CO2 emissions, not only did the Clean Power Plan establish a regulatory regime that required compliance through technology that had not yet been fully developed or demonstrated viable for commercial scale deployment, it failed to recognize and establish clear criteria that would determine the scientific and economic viability of such technology. In doing so, it deterred innovation in those areas; encouraging instead, lower risk, but ultimately counterproductive, CO2 avoidance strategies. When punished for producing CO2, rather than rewarded for avoiding it, innovation is stifled. A critical area where innovation must be encouraged and promoted is in the development of commercially viable Carbon Capture, Utilization and Storage (or Sequestration) - CCUS. This cannot be achieved only through incentives like tax credits, but must also be promoted through robust government funding, not only for pure research, but also for programs and research aimed at accelerating technology commercialization.

Technological Innovation Critical to Economy and Environment

According to the United Nations Intergovernmental Panel on Climate Change (UNIPCC), source of, and foremost global proponent of, the oft-quoted "international consensus on climate change", reducing CO2 emissions to the levels that, in their view, are required to achieve "climate stabilization", may not be possible at all without the wide-scale deployment of CCUS technology, and would, at a minimum, be 138% more expensive without that wide-scale deployment[iii]. To put that "138% more expensive" in context, it would cost an additional 2% to 3% of global GDP every year through the end of the century, tens and tens of trillions of dollars more, to achieve the IPCC defined emissions levels necessary for "climate stabilization" without the wide-scale deployment of CCUS[iv]. Yet, many of the staunchest proponents of action to achieve "climate stabilization" have done little or nothing to promote policies that will drive the technological innovation and deployment that the foremost expert body on climate change has said is critical to achieving that goal. Indeed, they have actively opposed the innovation necessary to further develop and deploy such technology.

In particular, the continued expenditure of billions of dollars a year to subsidize wind and solar energy production is a complete waste of resources. Those resources should be redirected immediately from wind and solar production subsidies to promoting CCUS innovation. According to their advocates, wind and solar are already market competitive, and are certainly commercially viable[v]. They have benefited from 40 years of relentless policy promotion at the state and federal level, and have received far in excess of $100 billion in federal subsidies alone in the last decade[vi]. Despite this enormous promotion and these lavish subsidies for non-dispatchable energy sources that have distorted wholesale electricity markets and disrupted grid stability, wind and solar still contribute less approximately 7% of all US electricity according to the Energy Information Administration. Meanwhile, coal powered electricity generation, which constitutes the single largest source of stationary CO2 emissions, is also the single largest fuel source for US electricity generation in the country, at over 31%. Thus, by using a fraction of the resources that have been dedicated to wind and solar, the largest single source of CO2 emissions could be largely wiped out with the wide-scale deployment of CCUS for coal, far exceeding any emissions reductions scheme yet envisaged.

The Obama-era punitive regulatory approach that encouraged short-term avoidance of, rather than long-term solutions to, emissions will continue to guide utilities until such time as policies are put in place that reestablish the innovate then regulate model. During the Obama era, chasing subsidies by building wind and solar, regardless of their inefficiency for the grid, and switching from higher CO2 producing coal to lower CO2 producing natural gas were the expedients for regulatory compliance. Yet, according to the IPCC, these actions simply will not achieve the emissions reductions claimed necessary for climate stabilization. So, while as a short-term cheat under the Obama punitive regulatory regime, such measures have yielded on-paper results, they are not long-term and lasting. In effect, affordable coal-power, regional economies, coal communities, and the livelihoods and lives of people dependent on coal are being sacrificed simply to appease the anti-coal activist community. Because, according to the scientific and economic consensus on which they base the need for climate action, without the wide-spread deployment of CCUS, among other measures, climate stabilization may not be possible and will cost an additional 2%-3% of GDP through the end of the century. And this short-sighted gaming of the system is not itself without enormous cost. Destroyed regional economies and the loss of high-paying anchor jobs in Appalachia and along the Ohio River Valley clearly demonstrate the very substantial social, economic, and political impact of gaming the system by sacrificing coal.

The current approach to emissions regulation is best characterized as "kick the can down the road and let it be someone else's problem". Because when every coal fueled power plant in the country is shut, and heavily subsidized wind and solar energy have fully saturated a, by then, wildly inefficient US electric grid, the emissions targets that the scientific and economic consensus defines as necessary for climate stabilization will not have been achieved. Then, having destroyed coal communities and regional economies around the country, all the money that would have kept them alive and well by driving innovation, development, and deployment of CCUS, *will still have to be spent* - for CCUS on natural gas. So, if the climate stabilization targets established by those who deem it the single greatest threat to humankind are to be met,

the same technology that would keep coal an affordable and plentiful energy source and save the economies, communities, and jobs that coal provides must be developed. Why then should they be sacrificed to appease anti-coal activists in the short-term?

Reallocation of Resources Needed – Action Must be Public and Private

Wide-scale deployment of CCUS requires similar support and promotion to that which other emergent technologies have benefitted from. It requires legislative promotion, regulatory support, tax incentives, and the direct promotion of technology development through federal government R&D. It further requires that utilities, rural electric coops, and CO2 capture beneficiaries such as those using it for enhanced oil recovery, be extended additional mechanisms for the financing of CCUS projects. Later in this written testimony, we will present specific recommendations touching on all these areas to create a long-term policy framework that should enjoy strong bi-partisan support and will drive innovation and emissions reductions for decades to come.

The promotion of, and investment in, technology innovation cannot be made entirely the responsibility of government. While the vastly diminished financial position of coal producers in recent years limits the extent of support for such efforts that is economically possible, Cloud Peak Energy is, nevertheless, actively involved in, and provides financial support for, actions and institutions to promote and support such innovation. These include, but are not confined to:

- A five year investment in support for the National Carbon Capture Center aimed at promoting technology development and innovation that will lower the costs of CCUS technology deployment;
- Membership in and support for the Carbon Utilization Research Council (CURC), the foremost institution in the US that brings together coal and natural gas producers, technology developers, academic institutions, and utilities to develop innovation road-maps that inform policies to promote technology innovation and effectively regulate emissions based on available and viable technology;
- Membership in and support for the Global CCS Institute, a member led, premier global organization the mission of which is to accelerate the deployment of carbon capture and storage (CCS) as an imperative technology in tackling climate change and providing energy security;
- Participation in, as a United States Department of Energy designated member, the Coal Industry Advisory Board to the International Energy Agency, a body that provides input and policy recommendations to promote global energy security while addressing concerns about emissions and climate change;
- Support for the University of Wyoming's School of Energy Resources and Carbon Management Institute in their research efforts to develop the innovative technologies that will drive future emissions reductions;
- Involvement in the National Enhanced Oil Recovery Initiative, an organization promoting policy solutions that will help drive deployment of CCUS technology and help ensure energy security through low cost oil

- Involvement in the Energy Innovation Reform Project, a coalition of industry, economic, academic, and labor organizations committed to cost-effective, innovation-led approaches to emissions reductions.

No Free-Market in Energy and Laissez-Faire Won't Work

While innovation must lead and drive the regulatory frameworks that are developed to address concerns about emissions and climate, and the legislation on which such frameworks are based must balance concerns about climate, economy, and energy security, it is unrealistic to simply suggest that "innovation will happen and regulation will follow". There is no "free-market" for energy. Energy markets are intensely regulated and their operation is entirely subject to high degrees of government intervention. Given the very long-term investment horizons involved in power generation projects, regulatory predictability is required to guide utility investment and technology development. For example, while many stakeholders are pleased to see the deeply flawed and illegal Clean Power Plan being rescinded, it is important that it be replaced with a lasting, long-term framework around which utilities can make plans. That framework must incentivize innovation to reduce CO2 emissions from the existing coal fleet and get new coal fueled electricity generation built with low to no emissions.

As outlined in a letter from Cloud Peak Energy President and CEO, Colin Marshall, to President Trump earlier in 2017, we believe that Congress must support domestic regulatory predictability promoting long-term investment in coal technology, so that coal can be part of a long-term energy future that ensures prosperity while addressing Americans' concerns about CO2 and climate. Congressional action in the following areas is extremely important to ensure the long term viability of coal as an affordable energy source and an economic anchor to regional economies across the country.

- Amendment and expansion of the 45Q Tax Credit for carbon capture and Enhanced Oil Recovery
- Creation of Private Activity Bonds for fossil fuel emissions reduction projects that will help markets finance technology innovation and deployment
- Extending the tax and equity benefits of Master Limited Partnerships to carbon capture projects
- Authorizing the Department of Energy to engage in Price Stabilization Contracts that diminish the volatility impact of oil price fluctuation on carbon capture projects built around Enhanced Oil Recovery
- Ensuring robust funding for Department of Energy Research and Development projects aimed at creating and making commercially available the technology that will allow the capture, use, and sequestration of carbon from coal and natural gas powered energy production and manufacturing.

Bi-Partisanship Required. Because Killing Coal Won't Save the World.

We believe that there should be strong bi-partisan support for such an approach. If the country continues along its current path, coal communities, the jobs and industries that anchor them, and the livelihoods of the people who depend on them, are at serious risk, and their demise would be a substantial cost to federal, state, and local governments. As a result, energy prices in the US will rise, with a chilling effect on growth and GDP; innovation and technology development to address fossil fuel emissions will be stifled, and; the climate stabilization targets set by those who deem climate change "the single greatest threat to global security" are extremely unlikely to be achieved. Inaction to widely deploy carbon capture and sequestration technology will most certainly require additional expenditures on the order of 2% - 3% of global GDP more through the end of the century to achieve substantial emissions reductions.

Bi-partisan support for policies that promote innovation has been on display in the Senate of late. During recent hearings on "Expanding and Accelerating the Deployment and Use of Carbon Capture, Utilization, and Sequestration" in the Environment and Public Works Committee, there was a remarkable degree of bi-partisan support for actions and legislation that would help move CCUS technology deployment forward. Such legislation includes The FUTURE Act (S. 1535) with some 25 co-sponsors from both parties, including Committee Chairman, Senator Barrasso (R-WY), and Committee member, Senator Whitehouse (D-RI), as original co-sponsors. Similar legislation exists in the House (H.R. 3761), introduced by Chairman Conaway (R-TX), with nearly fifty co-sponsors from both parties, showing that an innovate then regulate approach to emissions reductions that balances the goals of economic prosperity, environmental stewardship, and energy security does, in fact, enjoy bi-partisan support.

If, as many of the most voluble advocates for action to address climate change claim, it is "the single greatest threat facing mankind", then their response to date is grotesquely and irresponsibly underwhelming[vii]. The same scientific and economic consensus that they point to as the basis for the call to action recognizes that fossil fuels will be part of the global energy mix for the foreseeable future and that carbon capture, utilization where possible, and storage must be rapidly deployed to achieve the climate stabilization they say is necessary[viii]. In effect, climate activists who refuse to support the rapid development and deployment of CCUS are themselves deniers.

Today, the only known technology that will allow the world to continue to benefit from the economic growth and prosperity that affordable fossil fuels deliver, while addressing the legitimate concerns people have about fossil fuel emissions, is carbon capture and sequestration. Regardless of one's views on the legitimacy of concerns about CO2 and climate, action to reduce CO2 emissions is being taken around the world. The US should take the lead in developing and commercializing that technology, thereby creating new jobs and prosperity while protecting coal jobs, communities, and plentiful affordable energy.

Written Testimony from Cloud Peak Energy for Senate EPW Hearing: "Promoting American Leadership in Reducing Air Emissions Through Innovation" November 15, 2017

Human history and development have been all about innovation. One of the greatest innovations in human history, one that has lifted billions out of poverty, ignorance, and darkness has been harnessing fossil fuels for industry, power, and light. The next great leap in human innovation must be in developing and deploying the technologies that will allow humankind to benefit from fossil fuel energy, while severely limiting emissions from fossil energy power generation.

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[i] Cloud Peak Energy Inc. (NYSE:CLD) is headquartered in Wyoming and is one of the largest U.S. coal producers and the only pure-play Powder River Basin coal company. As one of the safest coal producers in the nation, Cloud Peak Energy mines low sulfur, subbituminous coal and provides logistics supply services. The Company owns and operates three surface coal mines in the PRB, the lowest cost major coal producing region in the nation. The Antelope and Cordero Rojo mines are located in Wyoming and the Spring Creek Mine is located in Montana. In 2016, Cloud Peak Energy shipped approximately 59 million tons from its three mines to customers located throughout the U.S. and around the world. Cloud Peak Energy also owns rights to substantial undeveloped coal and complementary surface assets in the Northern PRB, further building the Company's long-term position to serve Asian export and domestic customers. With approximately 1,300 total employees, the Company is widely recognized for its exemplary performance in its safety and environmental programs. Cloud Peak Energy is a sustainable fuel supplier for approximately three percent of the nation's electricity.

[ii] Source: Department of Energy, Fossil Energy Research Benefits Brochure, June 2011 .

[iii] Intergovernmental Panel on Climate Change (IPCC). Assessment Report 5, Mitigation of Climate Change, 2014. Edenhofer, O., et al

[iv] An International Commitment to CCS: Policies and Incentives to Enable a Low-Carbon Energy Future. Coal Industry Advisory Board Submission to the International Energy Agency, November 2016. Humphreys et al. Page 18

[v] "Solar and Wind Energy Start to Win on Price vs. Conventional Fuels". The New York Times. Nov. 23, 2014. https://www.nytimes.com/2014/11/24/business/energy-environment/solar-and-wind-energy-start-to-win-on-price-vs-conventional-fuels.html?partner=rss&emc=rss&_r=0

[vi] "Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013". Energy Information Administration. March 2015.

[vii] "No challenge--no challenge--poses a greater threat to future generations than climate change," President Obama, in address to the United Nations General Assembly, January, 2015

[viii] Intergovernmental Panel on Climate Change (IPCC). Assessment Report 5, Mitigation of Climate Change, 2014. Edenhofer, O., et al

Reference Material in Annex: Charts on Coal Consumption & Emissions Reductions

Senator BARRASSO. Senator Carper.

Senator CARPER. I am counting the number of times you say Wyoming today. We have a little town just south of Dover called Camden Wyoming. I go there a lot. I go through it a lot. So I am not in Camden Wyoming as much as he is in Wyoming.

Senator BARRASSO. We can start with the Neil Young song, the Emperor of Wyoming.

Senator CARPER. There you go. We sure could.

I want to go back to you for a question, Ms. Lipman. The Administration, this current Administration here in Washington signaled that it is interested in weakening heavy-duty and light-duty vehicle regulations, as you know. If we do that, what kind of effects is that likely to have on innovation and job creation?

Ms. LIPMAN. My testimony and my written testimony is a little more detailed. We have told a very optimistic story about the tremendous progress and the recovery in the auto sector and in the supply chain that we have seen domestically as a result of strong, certain, long term standards. Unfortunately, the converse is also true. If we were to roll back standards, or if we were to even introduce great uncertainty as to the future of the standards, we put jobs at risk, we put innovation at risk, and particularly we put at risk those investments that companies are thinking about making in the near term.

Our tier 1 suppliers—and I recently heard a supplier association talk to this—they operate worldwide, and they are looking at where will be the place that we are deploying this next generation of technology. Where should be put our R&D? Where should be put the manufacturing that goes with it? And if folks are not convinced that we are moving forward, we risk losing those investments.

Senator CARPER. Thanks.

There has been an ongoing discussion around the targets for energy efficient vehicles and that we are on a glide path between 2025 to a very rigorous target, and then there is nothing more in terms of target beyond 2025. In conversation with the auto industry, environmental folks, others about providing some flexibility between 2025, but then targeting for more rigorous target effective in 2030. That gives the industry some flexibility near term, but it gives them the certainty of something long term to focus on.

I was mentioning to the Chairman, I was present at the Detroit Auto Show 10 years ago when the Chevrolet Volt was launched. It got about 35 miles per charge. This year, when the Chevrolet Volt was launched, it gets 240 miles per charge. And it is only going to get better. Batteries only get better, and that is why we are seeing Ford and GM and a bunch of other companies here in this country and around the world saying we are going to do this, we are going to do this.

How important is it to have certainty beyond 2025 in this regard?

Ms. LIPMAN. At the risk of repeating myself and my testimony——

Senator CARPER. Just repeat yourself briefly.

Ms. LIPMAN. Yes. Strong, long term certain standards are critical, and the more that industry can look out, can make those plans, again, not just the automakers, but the suppliers, the better.

And I think to the extent that it is possible to extend that trajectory, the more we are likely to have people willing to make the deep commitments and long term commitments to the next generation of technology in America.

Senator CARPER. OK. Thank you.

Ross, just a quick comment, please, on this.

Mr. EISENBERG. So, we still have a mid-term review that we have to complete for the current set. This is an industry that has never really shied away from long term standards. I just hope that when we get there it is a data driven process and it gets to a place where everybody wins. We were able to see that the first round, and frankly, a little bit of the second round, so hopefully it all works out well in the end.

Senator CARPER. OK. Thank you.

Mr. EISENBERG. An inclusive process is a good one.

Senator CARPER. Thanks very much.

My last question for the panel is how do we make clean air a bipartisan issue again? I thought this was going to be a great hearing. It has been a good hearing. I have been excited about this hearing for weeks. But how do we make this a bipartisan issue again? What are some of the suggestions that you would give us that we can maybe work across the aisle to lift up communities that are being left behind, like my native State of West Virginia, while continuing our clean energy global leadership?

Kipp, do you want to lead us off?

Mr. CODDINGTON. Yes. Thank you, Senator Carper. I actually view this as a bipartisan issue, and I am coming at it from the point of view of Federal support for research and development. And certainly sitting in the States outside of the Beltway, I think there is support for the advancement of these technologies and the ongoing critical role of the Federal Government. So call me politically naive, but I actually view these issues as bipartisan at the end of the day, and we are very thankful for the ongoing Federal support that we have received.

Thank you.

Senator BARRASSO. If I could just follow up on that. Mr. Coddington, this will be my last question as well, because I was in the——

Senator CARPER. I was asking the whole panel.

Senator BARRASSO. Oh, I apologize.

Senator CARPER. Same question. How do we make clean air a bipartisan issue again? Any suggestions of how we can move in that direction?

Mr. EISENBERG. So, I have been asking the same question. I testified before the Energy and Commerce Committee back in February and said, hey, it is time to really put our hands together and figure out how to modernize some of these policies, like you guys did with TSCA. I mean, this is begging for a similar approach. But to your point, there has to be a lot of work done to build trust and make it a bipartisan issue.

Our hope is that maybe by building around some of these areas that get in the way of clean energy and efficiency gains we can start to build some of that trust up and some of those working relationships up. It is not, in our view, a good versus evil kind of thing;

we are all driving toward the same end zone here. We just need to sort of get passed some of the past fights that we have had and work toward something positive.

Senator CARPER. All right, thanks.

Zoe.

Ms. LIPMAN. We are finally coming together at least on the panel.

Senator CARPER. Seems like kumbaya moment.

Ms. LIPMAN. We also view this as a tremendous opportunity to achieve health and environmental gains that we know are supported by both sides of the public, if not both sides of the aisle. But also there is a tremendous opportunity to both engage all the stakeholders, as you mentioned, Ross. I think this is critical, and it can be done through a variety of processes. We do it at a State level, and ourselves, have seen tremendous opportunity. And the second is to continue to connect this to rebuilding manufacturing and good jobs in America. And there is tremendous opportunity to bring folks together around how does meeting our climate and energy goals help drive forward an agenda to rebuild America's economy, which I think we all share.

Senator CARPER. Thanks.

Mr. Chairman, just a closing thought, if I could. This kind of conversation with you and me. I think Shelley put her finger on something, and she represents a State that has great dependence still on coal and also on natural gas. Certainly, Wyoming does. We are moving toward electric powered vehicles. If I had any question about that a year or two ago, I don't anymore. And with the announcements coming out of Ford and GM, it is clear that that is where we are headed here in this country, too.

And her point—and it is a very good point—is how are we going to generate the electricity to fuel those vehicles. And the source of the generation of that electricity could be coal. It has to be really clean coal. I think we have the technology. We are moving in that direction. After long, long ramp-up, we are moving in that direction to actually be able to do that a lot better. Certainly, natural gas and renewables. But at the end of the day, how we generate electricity in a clean way and put those vehicles on the road using virtually no petroleum for a lot of those vehicles, that is going to do wonders for the quality of our air, and we just need to lead the charge. We have to be leading the charge in technology to get that done; not only on the clean coal side, but also in the generation of storage for batteries. If we do that, we will create just a truckload of jobs.

Thank you all.

Senator BARRASSO. Thank you, Senator Carper.

A final for Mr. Coddington. I am delighted I was in the State Senate in Wyoming, in the legislature, at the time that the School of Energy Resources was brought into play, and it is wonderful to see here we are, a decade or so later, with significant successes.

I wanted to mention to you that the University of Wyoming is committed to research that seeks collaborative solutions to energy and environmental needs.

My final question is could you just explain how the approach at the University of Wyoming School of Energy Resources adopts is

unique and how other States might be able to benefit from a similar collaborative approach?

Mr. CODDINGTON. Absolutely. Thank you, Mr. Chairman. So, the School of Energy Resources is separately funded by the University of Wyoming legislature, and it has this bridge building applied energy, applied research role, and the goal of it is to ensure that academic research, in this instance that has an energy focus, actually has a perceived outcome that is going to benefit all relevant stakeholders and taxpayers in the State of Wyoming.

So we do work collaboratively with colleagues on campus. We work a lot with industry partners. We have a close working relationship with the Wyoming legislature. So we are supporting academic research, but we always have in the back of our mind what is the potential return for the taxpayer and those who are funding universities such as ours. So I think it has been a successful model, and it is a privilege to be there, and thank you for your support of it, Mr. Chairman.

Senator BARRASSO. Well, thank you very much.

Thank you to all three of our witnesses. I thought they did a wonderful job in discussing this topic.

Senator CARPER. He always says that.

[Laughter.]

Senator CARPER. No, he doesn't. I always say that.

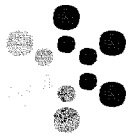
Senator BARRASSO. He always says that.

I would remind the members that other members of the Committee may be submitting written questions for the record, so the hearing will remain open for 2 weeks. I want to thank you again for being here, for your testimony on this important issue.

The hearing is adjourned.

[Whereupon, at 11:16 a.m. the Committee was adjourned.]

[Additional material submitted for the record follows:]



AmericanCoatings
ASSOCIATION℠

December 6, 2017

The Honorable John Barrasso, Chair
Committee on Environment and Public Works
U.S. Senate
Washington, DC 20510

The Honorable Thomas Carper, Ranking Member
Committee on Environment and Public Works
U.S. Senate
Washington, DC 20510

RE: Promoting American Leadership in Reducing Air Emissions Through Innovation Hearing, November 15, 2017; Statement of Support on behalf of the American Coatings Association, Inc.

Dear Chairman Barrasso and Ranking Member Carper:

The American Coatings Association (ACA) is pleased to submit this statement of support for the Committee on Environment and Public Works hearing on "Promoting American Leadership in Reducing Air Emissions Through Innovation," and to showcase the efforts of the coatings industry in reducing air emissions.

ACA is a voluntary, non-profit trade association working to advance the needs of the paint and coatings industry and the professionals who work in it. The organization represents paint and coatings manufacturers, raw materials suppliers, distributors, and technical professionals. ACA serves as an advocate and ally for members on legislative, regulatory and judicial issues, and provides a forum for the advancement and promotion of the industry through educational and professional development services. ACA's membership represents over 90% of the total domestic production of paints and coatings in the country.

ACA is eager to highlight the coatings industry's successes in reducing air emissions from our products and our facilities due to aggressive and robust research and development activities. Innovation has driven market demand for environmentally friendly products, which has resulted in significant reductions in both hazardous air pollutants (HAPS) and volatile organic compound (VOC) emissions from production in recent years. At our recent Coatings Industry Policy Summit, ACA sponsored a luncheon for congressional staff to specifically discuss these and other innovations by coatings manufacturers.

The Coatings Industry's Addresses Environmental Issues Proactively

The paint and coatings industry has taken steps for maximum environmental improvements by managing and minimizing toxins and wastes, reducing air emissions, and promoting product and environmental stewardship. Here is a short list of our environmental successes:

- More than 90% of architectural coatings sales in the United States are now for environmentally preferable water-based paint.
- VOC emissions from architectural coatings have drastically decreased over the last few decades, even while the use of architectural coatings has increased over the same period nationwide. California's South Coast Air Quality Management District estimates that VOCs from architectural coatings in the Los Angeles area — the air basin with the most severe air quality issues in the country — decreased by over 50% between 2008 and 2014.
- The U.S. Environmental Protection Agency's (EPA) Toxic Release Inventory (TRI) indicates releases by the paint and coatings sector decreased by 81% between 1990 and 2014. Toxicity-weighted results for air releases present an even more significant decline, decreasing 94% from 1990. Air toxics — also known as HAPs — decreased by 82% between 1990 and 2014, and toxicity-weighted air toxics releases declined by 94%.
- The paint and coatings industry reduced its total production waste by 48%, from 1995 to 2013, while increasing the percentage of the total waste it recycles by over 81% during that period.
- The paint, coatings, and adhesives manufacturing industry reduced its generation of Resource Conservation and Recovery Act (RCRA) hazardous waste in the United States by over one-third (34.8%) since 2001.
- 97% of all waste solvents from paint and coatings manufacturing facilities are reclaimed for future use.
- The total quantity of electricity purchased and used for heat and power — and as a result, greenhouse gas emissions — from the paint and coatings sector decreased by 17.8 % between 2007 and 2012.

Here are some real examples of how the coatings industry's research and development efforts have resulted in environmental gains, including reductions in air emissions in a variety of market sectors, as well as strides in sustainability.

Architectural Paints

- Many architectural paints — both interior and exterior — are now paint and primer in one product, which allows for a paint-job with fewer coats, translating to greater efficiency and environmental advantages. These combinations are designed to provide a high-quality application that is more durable and lasts longer, thereby reducing the frequency for repainting or multiple applications.

- Emulsion technology used in architectural paints allows for low-VOC, near odorless paints with high-scrub resistance, and come in a variety of finishes, from flat to semi-gloss sheens.

- Certain architectural paints use renewable, bio-based or recycled ingredients, such as recycled plastic and soybean oil, shifting away from organic solvents. Bio-based products are composed of agricultural, forestry, or marine materials. Such innovation has been recognized with the Presidential Green Chemistry Challenge Award.

- Specially formulated low-emitting interior coatings protect the health and comfort of sensitive populations, including children in schools and patients in hospitals.

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Cool Roofs

- Cool roof coatings not only lower buildings' energy consumption and costs, but also overall temperature and stress on the power grid. This effort could help reduce New York City's greenhouse gas emissions 30% by 2030.

- According to the National Resources Defense Council, 'smart roofs' employing cool coatings technology substantially reduce energy costs and curb carbon pollution.

- The U.S. Department of Energy (DOE) estimates that replacing or resurfacing conventional roofing materials with improved reflective elastomeric roof coatings can reduce a commercial building's annual air conditioning energy use by up to 25%.

Aerospace Coatings

New technology in aerospace coatings can minimize drag in the air and eliminate debris build-up, both of which reduce airplane fuel consumption, and thereby, carbon footprint. Such savings have both an economic and environmental impact that cannot be understated: a 1% improvement in fuel efficiency in the aviation industry can lower fuel costs by $700 million a year, according to the International Air Transport Association (IATA). On average, airlines incur about $100 a minute per flight in total operating costs, IATA says. Therefore, even saving just one minute of flight time could reduce total industry operating costs by more than $1 billion a year and significantly reduce environmental emissions.

Automotive and Industrial Coatings

Many additives are made from bio-based molecules, especially those in automotive and industrial paints, and give those waterborne paints a better carbon footprint: they enable faster drying times and provide a smoother finish. When automakers paint cars, they typically pass them through an oven twice to speed the drying process. Such additives make it possible to eliminate one of the baking steps, thus reducing the overall energy consumed. Another benefit: the faster drying time can also increase the number of cars that can be painted during a work shift.

Marine

Special marine coatings called antifouling coatings help reduce the growth of marine organisms on immersed areas of ships, which reduces the ship's energy and fuel consumption. Antifouling coatings carry tremendous eco-efficiency benefits: when applied to tankers, bulk cargo and other vessel types, they can reduce greenhouse gas and other emissions by an average of 9% — no small feat, since shipping counts for an estimated 2-4% of global greenhouse gas emissions.

Communications

Optical fiber coatings make telephone and internet technology possible by protecting the glass fibers that transmit telecommunications signals. Such technology allows an estimated 3.9 million people to telecommute, reducing gasoline consumption by 840 million gallons and CO_2 emissions by almost 14 million tons.

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Obstacle and Barriers to Manufacturing

These stories of innovation and environmental successes are amazing and there are many more examples in the coatings industry. Research and development, and quite frankly, innovation cannot occur without the appropriate regulatory schemes to facilitate these activities. As such, I would like to highlight several legislative and regulatory barriers that make such progress less likely.

Ozone standard
Implementation of the 2015 ozone standard required states to identify whether they are in attainment or in non-attainment by February 2017. Reviewing the ozone standard is a recurring mandate under the Clean Air Act.

EPA's 2015 final rule on the ozone standard is forcing many states that are currently "in attainment" to "non-attainment" status, triggering a requirement to revise their State Implementation Plans and adopt even stricter VOC emission regulations for coatings. This triggering event is being realized as ozone monitors across the country are demonstrating a marked improvement in air quality under the 2008 standard of 0.75 ppm. Indeed, the previous standard of 0.75 ppm was not yet fully implemented.

Cost to the Coatings Industry: EPA's final stringent ozone standards will limit business expansion in nearly every populated region of the United States and impair the ability of U.S. companies to create new jobs. EPA's lowered range adds unnecessary red tape for companies seeking to expand even in areas that can attain those standards. Increased costs associated with restrictive and expensive permit requirements will likely deter companies from siting new facilities in a nonattainment area. ACA shares the practical concerns of manufacturers regarding potential exorbitant costs that this regulation would create for the paint and coatings industry without commensurate benefits to public health or the environment. *A study conducted by the National Association of Manufacturers (NAM) and NERA Economic Consulting, estimated this final rule could cost the economy $140 billion per year, result in 1.4 million fewer jobs, and cost the average household $830 per year in the form of lost consumption — making this the "costliest regulation in history" and threatening manufacturing.*

Recommended Solution: ACA urges a two-step solution to this problem: 1) EPA should revert to the 2008 standard of 0.75 ppm and fully implement this standard so that the forward progress already achieved can be extended without unnecessarily burdening the paint and coatings industry with increased standards and costs for many years to come; and 2) the Clean Air Act should be amended to extend the time for review of the ozone standard to every 10 years. Currently, the law requires a review every five (5) years. Extending the review of the ozone standard to every 10 years will allow for more stability in the marketplace for formulators while still protecting human health and the environment.

Once in, Always in Policy
This "regulation" is a May 16, 1995 EPA memorandum titled, "Potential to Emit (PTE) for MACT Standards – Guidance on Timing Issues," from John Seitz, Director, Office of Air Quality Planning and Standards (OAQPS), to Regional Air Division Directors — commonly known as the "Once in, Always in" memo — and may be found here: https://www.epa.gov/sites/production/files/2015-08/documents/pteguid.pdf.

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A "major source" is defined as a source that has the potential to emit (PTE) hazardous air pollutants (HAP) up to 10 tons per year (tpy) of any single HAP or 25 tpy of any combination of HAPs. Sources below this threshold are considered "area sources."

Under the "once in, always in" policy, a major source may become an area source (i.e., minor source) by limiting its PTE HAP below the major source thresholds by no later than the first compliance deadline listed under the applicable Maximum Achievable Control Technology (MACT) standard (also referred to as National Emission Standards for Hazardous Air Pollutants or NESHAP). However, a source that fails to achieve "area source status" by the first MACT compliance deadline must remain subject to the MACT *even if it subsequently reduces HAP emissions below major source levels at a later date*. In other words, sources will always be subject to the MACT rules, regardless of whether the source is no longer a major source of HAP.

Note that that EPA published a proposed rule on January 3, 2007 to replace the "once-in always in" policy rule - (docket number EPA-HQ-OAR-2004-0094. https://www.epa.gov/ttn/atw/gp/fr03ja07.pdf). However, this rulemaking was never finalized.

The coatings manufacturing industry has substantially reduced the use of HAPs since the 1990s. In fact, many facilities subject to the Miscellaneous Coatings Manufacturing (MCM) and Miscellaneous Organic Chemical Manufacturing MACT (MON) MACTs are now "area source" facilities, but still must comply with the MCM requirements even though they are not major source facilities. While many coatings and resin manufacturing operations could reduce emissions prior to the first compliance date of the MCM and MON, other facilities could not. Facilities that could not reduce their emissions have since installed expensive thermal oxidation units.

This "policy" or "guidance" has been applied by EPA as a "rule," with binding effects on the regulated community, including very burdensome compliance costs. This guidance is outdated and unnecessary and imposes a substantial burden on industry that well exceeds any benefits. Industry resources spent on compliance could be used instead for R&D, or modernization activities. This policy also acts as a disincentive for industry, since facilities have no incentive to voluntarily reduce HAP emissions below major source thresholds.

Cost to the Coatings Industry: Thermal oxidation units require a significant capital investment (millions of dollars per facility) and annual operation and maintenance costs (several hundred thousand dollars per facility per year in fuel cost alone). These units consume large amounts of electricity and natural gas, which results in additional emissions of carbon dioxide, nitrogen oxides and carbon monoxide. *EPA has estimated that installation and operating of air pollution controls for the MCM and MON rules would require an overall energy demand increase of 5.83 trillion BTUs; a total capital expenditure of $184 million; yearly operating costs of nearly $91 million; and an increase in NOx, CO, SOx emissions of 987 tons per year.*

ACA and other organizations have flagged this policy and requested that EPA withdraw or rescind it.

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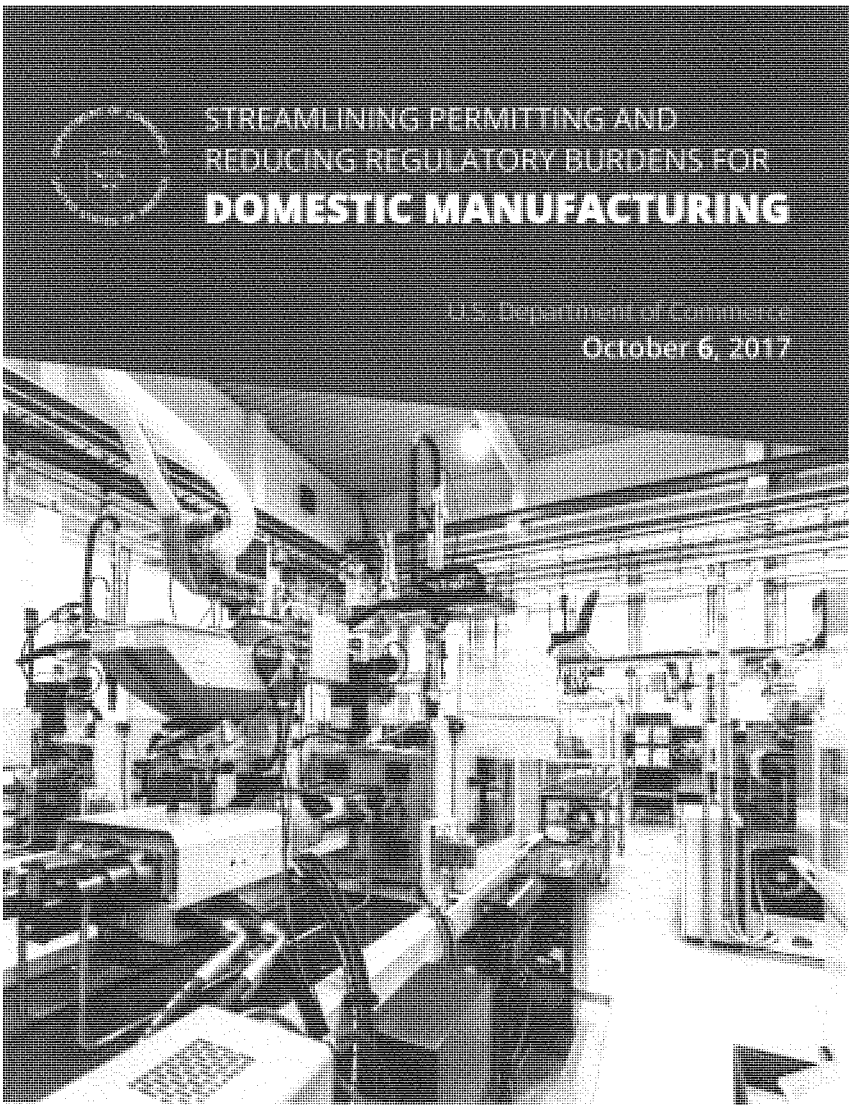
Thank you for the opportunity to share some of the exciting innovations of coatings manufacturers as well as some of our challenges. Please do not hesitate to have your staff contact me should you have any questions or require additional information and these important topics.

Best regards,

Heidi K. McAuliffe, Esq.
Vice President, Government Affairs


STREAMLINING PERMITTING AND
REDUCING REGULATORY BURDENS FOR
DOMESTIC MANUFACTURING
U.S. Department of Commerce
October 6, 2017

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Introduction

Federal regulations impose enormous costs on America's businesses and working families. These costs burden virtually every sector of our economy, although the manufacturing sector is disproportionately hard hit. The direct costs on manufacturing companies were estimated by the National Association of Manufacturers (NAM) to be $138.6 billion as of 2014,[1] though this estimate does not include indirect negative effects on the U.S. economy such as reduced innovation and global competitiveness, lost investment, and significant job losses. Small businesses are also disproportionately burdened by excessive federal regulation.

As a nation, we can and must do better. That is why, on January 24, 2017, President Trump signed a Presidential Memorandum on *Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing*.[2] The Memorandum, which is one part of an Administration-wide regulatory reform agenda,[3] required the Secretary of Commerce, in coordination with other executive departments and agencies, to conduct outreach to stakeholders on the impact of federal regulations and permitting requirements on domestic manufacturing and to submit a report to the President setting forth a plan to streamline federal permitting processes and to reduce the regulatory burdens affecting domestic manufacturing.

For this report, the Department of Commerce sought input from stakeholders through a Request for Information (RFI) published in the Federal Register.[4] The RFI asked industry stakeholders to identify the most burdensome regulations and permitting requirements they face and requested feedback on how regulatory compliance and permitting could be simplified. This report reflects extensive, thoughtful comments received from U.S. manufacturers as well as upstream and downstream industries closely linked to the manufacturing sector.[5] It aggregates and summarizes many of the most important recommendations raised by industry and presents the Department's recommendations for streamlining the federal permitting processes and reducing the regulatory burdens that affect domestic manufacturing.

In response to the RFI, industry expressed clear support for the need to protect the environment, human health, and worker safety, but shared concrete, detailed concerns about how the federal government tries to achieve those objectives. Respondents identified numerous regulatory and permitting problems,

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[1] W. Mark Crain and Nicole V. Crain, "The Cost of Federal Regulation to the U.S. Economy, Manufacturing, and Small Business," A Report for the National Association of Manufacturers, September 2014.
[2] 82 FR 8667 (January 24, 2017).

[3] President Trump has issued several executive orders that provide impetus and direction for regulatory reform efforts. These include EO 13771 on Reducing Regulation and Controlling Regulatory Costs, which directs departments and agencies to identify for elimination at least two regulations for every one new regulation issued; EO 13777, on Enforcing the Regulatory Reform Agenda, which requires agencies to designate a Regulatory Reform Officer (RRO) who is responsible for overseeing regulatory reform initiatives, and to establish a Regulatory Reform Task Force (RRTF); and EO 13683 which directs agencies to review regulations affecting the domestic energy industry and to appropriately reduce undue burdens to the development of domestic energy resources.
[4] 82 FR 12786 (March 7, 2017).

[5] This report focused on regulatory and permitting issues that directly impact the construction, operation or expansion of manufacturing plants. While focused on the manufacturing sector, upstream and downstream industries also submitted comments echoing the concerns of U.S. manufacturers and highlighting unique issues that they face. This report includes that input because regulatory barriers that adjoining industries experience can weaken production and investment in the domestic manufacturing sector.

including: onerous and lengthy permitting processes that increase cost, add uncertainty, and inhibit investment in new and existing manufacturing facilities; inadequately designed rules that are impractical, unrealistic, inflexible, ambiguous, or that show a lack of understanding of how industry operates; unnecessary aspects of rules, or unnecessary stringency, that are not required to achieve environmental or other regulatory objectives; overlap and duplication between permitting processes and agencies; and overly strict or punitive interpretations of guidance, policies or regulations that are often counter to a pro-growth interpretation. The Department identified 20 sets of regulations and permitting reform issues from the respondents as being a top priority for immediate consideration. See the section titled, "Recommendations and Priority Areas for Reform."

Despite numerous regulatory reform initiatives over the years, businesses continue to express concerns about increasing regulatory burdens. The fact that manufacturers continue to raise the same concerns, even after decades of regulatory reform efforts by the federal government, indicates a failure on the federal government's part to fully engage with regulated industries and fully understand the real-world impact of its regulations. There is a vital need for better dialogue and understanding between regulators and industry. In the meantime, the urgency for reform continues to grow. A 2017 NAM study states that most manufacturers perceive their regulatory burden to have increased significantly, such that reducing their current burden is at least as important as reducing the cost of new regulations.[6] We must do both.

Summary of Recommendations

The Department makes three major recommendations based on a thorough review of responses to the RFI.

Agency "Action Plans". Each agency's Regulatory Reform Taskforce (RRTF) should deliver to the President an "Action Plan" in response to all permitting and regulatory issues highlighted in the responses to the RFI, with particular attention to the "Priority Areas for Reform" section located at the end of the report.

Annual Regulatory Reduction Forum. There is no regular process for consultations with industry to identify specific actions the federal government can take to eliminate unduly burdensome regulations and accelerate permitting decisions. Thus, the Department recommends creating an annual, open forum for regulators and industry stakeholders to evaluate progress in reducing regulatory burdens.

Expanding the Model Process in FAST-41. The FAST Act[7] contains various provisions aimed at streamlining the environmental review process, with improved agency coordination through the creation of

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[6] National Association of Manufacturers, "Holding US Back: Regulation of the U.S. Manufacturing Sector," prepared by Pareto Policy Solutions, LLC.

[7] Title 41 of the Fixing America's Surface Transportation Act of 2015 ("Fast-41", codified at 42 U.S.C. § 4370m) streamlines the Federal environmental review and permitting for certain infrastructure projects. FAST-41 created an interagency Federal Permitting Improvement Council (FPISC); established new procedures for interagency consultation and coordination practices; authorized agencies to collect fees to help speed the review and permitting process; and uses the Department of Transportation's "Permitting Dashboard" to track all covered projects.

a Coordinated Project Plan and a Permitting Dashboard. Covered projects will typically enjoy better coordination, transparency of approvals, and expedited permitting. The Department recommends that the Administration use existing authority to extend the use of streamlined permitting procedures in the FAST Act to any project that will result in a significant, immediate economic benefit to the United States. For example, consideration could be extended to funded, qualifying projects in a new "economically significant" category. Consideration should be extended to complex, funded manufacturing projects that are in late stages of development and that can demonstrate significant net direct and indirect benefits to the domestic economy. To be eligible for the current streamlining process, projects in this sector or category would still need to meet the definition of a "covered project" under FAST-41.

FAST-41 provides a model process that could be incorporated into other Federal legislation that governs Federal programs and requirements that apply to manufacturing facilities. To expand further the universe of manufacturing projects that benefit from streamlined regulatory approval processes, the Administration could work with members of Congress to both expand the definition of "covered project" under FAST-41 and to incorporate procedures similar to those found in FAST-41 in other legislation applicable to manufacturing projects.

The Department believes that these three recommendations, if executed promptly and with constant, aggressive leadership, will yield significant results. Set forth below is (i) a summary of issues raised in response to the RFI; (ii) an analysis relating to potential reforms; and (iii) specific recommendations and priority areas for reform.

Issues Raised in Response to the RFI

Regulatory and Permitting Problems — Key Themes

This section discusses priority regulatory and permitting issues that were identified from the RFI responses and related outreach.[8] Respondents did not question the need to protect the environment, human health, or worker safety but they expressed concern about how regulations are employed to achieve those objectives, including:

- Onerous and lengthy permitting processes that increase cost, add uncertainty, and inhibit investment in new and existing manufacturing facilities;
- Inadequately designed rules that are impractical, unrealistic, inflexible, ambiguous or lack understanding of how industry operates;
- Unnecessary aspects of rules, or unnecessary stringency, not required to achieve environmental or other regulatory objectives;
- Overlap and duplication between permitting processes and agencies; and
- Overly strict or punitive interpretations of guidance, policies or regulations that are often counter to a pro-growth interpretation.

Table 1 provides some examples of these issues:

[8] Responses to the RFI are collected under Docket ID DOC-2017-0001, at www.regulations.gov. Department of Commerce officials also attended a listening session organized by the National Association of Manufacturers (NAM) during which trade association representatives highlighted multiple regulatory and permitting issues. NAM, individual companies and trade associations later submitted comments detailing these issues to the public docket. Upon request, Department of Commerce officials also agreed to meet with company or trade association representatives that had submitted comments to the docket.

Table 1. Examples of Key Issues that Were Identified by Respondents		
Category	**Problem**	**Examples from RFI Responses**
Inadequate Rule Design	A regulation is written or implemented with a lack of "on the ground" knowledge about how the regulated industry operates,[9] is economically or technologically infeasible, or is based on unrealistic data or assumptions	National Ambient Air Quality Standards (NAAQS) — unrealistic assumptions on background levels; Crystalline Silica Exposure Standard
	There is a lack of clarity around the requirements needed to comply with the regulation	Clean Water Act (CWA) — Definition of Waters of the United States
	The regulation is inflexible or too prescriptive; overly strict interpretations of policy and guidance	New Source Review (NSR) Permitting Process — inflexibility in allowing for aggregation of emissions within a plant
	Overlap or duplication of rules	New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP) — overlap
	A better regulatory approach exists to achieve the objectives or the approach actually undermines key regulatory objectives	Resource Conservation and Recovery Act (RCRA) — inappropriate classification of certain waste streams as hazardous, which has perverse effect of discouraging recycling of this waste
	The regulation is outdated	Leak Detection and Repair Rules — outdated monitoring technology options
	Regulatory over-reach — goes beyond statute or rulemaking	New Source Performance Standards (NSPS) — enforcement beyond rules
	Complex, onerous, inefficient and lengthy processes, particularly permitting processes	New Source Review (NSR) Permitting Process
	Uncertainty, particularly permitting processes	Section 404 Wetlands Permitting Process (wide variation in duration)

Cumbersome Processes — Particularly Onerous Permitting Processes	Overlap, duplication or poor coordination between agencies, rules or permits	Title V permitting decisions can be a basis for "re-litigating" decisions already made under NSR pre-construction permitting processes
	Inconsistency, among agencies or between federal and state regulatory authorities, in application or enforcement of rules	CAA permits — EPA often intervenes in state decisions

Selection of Priority Specific Regulatory and Permitting Issues

The selection of priority regulatory and permitting issues in this section was based on the following criteria:

- The volume of responses citing a particular issue (see Table 2 below).
- The number of in-depth or broad scope responses that discussed the issue.
- Comments in the responses that highlighted an issue as of particular importance in terms of regulatory burden or estimated costs; for example, NSR/PSD under the Clean Air Act was often singled out as the most significant regulatory and permitting burden, and the ozone NAAQS standard and crystalline silica exposure standard were both highlighted as resulting in very high costs.
- Issues that were discussed in sufficient detail to identify the nature of the burden and point toward potential solutions and actionable recommendations.[10]
- Some issues were included (or considered) because they have been longstanding challenges.

[9] In response* to the following question: "The most challenging regulations to comply with are due to ____, the statement that most commonly represented the experience of manufacturers surveyed by NAM (41.7% of responses) was "regulatory agencies writing a final rule absent an adequate understanding of my business and my compliance challenges." (National Association of Manufacturers, "Holding US Back: Regulation of the U.S. Manufacturing Sector.").

[10] As an example, though there were numerous concerns expressed about recent changes to the Toxic Substances Control Act (TSCA), resulting from the Lautenberg Chemical Safety Act, the responses did not coalesce around a specific set of issues or recommendations.

Table 2. Most Frequently Cited Regulatory & Permitting Issues that Impact Manufacturing			
	Federal agency	**Issue area**	**# Commenters**
1	EPA	Clean Water Act (CWA): Wetlands Permits and Waters of The United States (WOTUS)	42
2	EPA	Clean Air Act (CAA): National Emissions Standards for Hazardous Air Pollutants (NESHAP) and New Source Performance Standards (NSPS)	41
3	EPA	CAA: New Source Review and Prevention of Significant Deterioration Permits (NSR/PSD)	40
4	EPA	CWA: National Pollutant Discharge Elimination System (NPDES) Permits	31
5	EPA	CAA: Greenhouse Gas Requirements	29
6	EPA	CAA: National Ambient Air Quality Standards (NAAQS) (general)	28
7	EPA	Resource Conservation and Recovery Act (RCRA)	18
8	EPA	Risk Management Programs and Reduced Risk and Tech Review	19
9	EPA	Toxic Substances Control Act (TSCA)	18
10	Department of Labor (DOL)	Improve Tracking of Workforce Injuries and Illnesses	14
11	Departments of Interior and Commerce (DOI and DOC)	Endangered Species Act (ESA)	13
12	Securities and Exchange Commission (SEC)	Conflict Minerals Rule (Dodd-Frank)	12
13	EPA and others	National Environmental Policy Act (NEPA)	11

14	EPA	Regional Haze Requirements	10
15	DOL	Crystalline Silica Exposure	10
16	DOL	Overtime Rule	9
17	EPA	Comprehensive Environmental Response, Compensation & Liability Act (CERCLA)	9
18	EPA	Spill Prevention, Controls, and Countermeasures	9
19	Equal Employment Opportunity Commission (EEOC)	EEO-1 Form	7
20	Department of Health and Human Services (HHS)	Food Safety Modernization Act (FSMA)	5

Priority Regulatory and Permitting Issues

This report focuses on regulatory and permitting issues that directly affect the construction, operation or expansion of manufacturing plants. While some of these regulatory issues primarily affect the manufacturing sector, others affect businesses across multiple sectors. Several issues are highlighted due to their indirect impacts on manufacturing, a perceived high level of adverse impact on economic growth, and other factors. The following are priority regulatory and permitting issues identified by respondents to the RFI. Refer to the appendix for a list of respondents that are referenced in this report.

Clean Water Act: Wetland Permits and Waters of the United States (WOTUS) Rule

As part of the Clean Water Act (CWA), the Environmental Protection Agency (EPA) regulates discharges of pollutants into "waters of the United States." In 2015, EPA promulgated the Clean Water Rule[11], which was perceived by many respondents to have expanded the definition of waters of the United States — or at least added ambiguity to its definition — in ways that extend federal authority beyond the traditional limits. Different sources describe the expanded scope in different ways. For example, NAM states that it "extend(s) federal jurisdiction of CWA programs well beyond traditional navigable waters to ephemeral tributaries, flood plains, adjacent features and vaguely defined 'other waters'... For manufacturers, the

[11] 80 Fed. Reg. 37054 (June 29, 2015).

uncertainty of whether a pond, ditch or other low-lying or wet area near their property is now subject to federal CWA permitting requirements, can introduce new upfront costs, project delays and threats of litigation." (146-NAM) The U.S. Chamber of Commerce (CoC) states that it includes "ditches, canals, and even land that is dry most of the year, as long as water runs over that land sometime on its way to interstate waters." Many respondents expressed the view that the definition of "waters of the United States" set in the rule is too broad and that a narrower definition would be appropriate. (6-NFIB, 146-NAM)

The rule was stayed by the 6th Circuit Court of Appeals on October 9, 2015.[12] On February 28, 2017, the President issued Executive Order 13778 directing the EPA and the Army Corps of Engineers (Corps or USACE) to review the WOTUS rule. On March 6, 2017, the Corps and EPA published a notice announcing their intent to review the rule and seek to provide greater clarity concerning the definition of "waters of the United States."[13] On July 27, 2017, the EPA and the USACE published a proposed rulemaking to repeal the 2015 Clean Water Rule and reinstate the regulations in place prior to its issuance.[14] As indicated in the proposed withdrawal, the agencies are implementing EO 13778 in two steps to provide as much certainty as possible as quickly as possible to the regulated community and the public during the development of the ultimate replacement rule. In Step 1, the agencies are taking action to maintain the legal status quo of the rule in the Code of Federal Regulations, by recodifying the regulation that was in place prior to issuance of the 2015 Clean Water Rule. Currently, Step 1 is being implemented under the U.S. Court of Appeals for the Sixth Circuit's stay of the rule. In Step 2, the agencies plan to propose a new definition that would replace the approach in the 2015 Clean Water Rule with one that reflects the principles in EO 13778.

Clean Air Act: National Emissions Standards for Hazardous Air Pollutants and New Source Performance Standards

The National Emissions Standards for Hazardous Air Pollutants (NESHAP) of the Clean Air Act (CAA) limits emissions levels for specific pollutants from a variety of specific sources and manufacturing processes. The Air Permitting Forum (APF) provides a summary of how NESHAPs work:

> The CAA Section 112 program covers the regulation of hazardous air pollutants (a defined list) for various source categories. Initially, these NESHAPs were established based on a review of currently employed air pollution control technology applied to existing and new sources (referred to as Maximum Achievable Control Technology, or MACT). Then, after eight years, the statute requires EPA to conduct residual risk and technology reviews. EPA assesses the risk remaining after application of MACT controls and determines if it is acceptable. If not acceptable, further controls must be applied. EPA is also required [every eight years] to evaluate if advances in control

[12] Ohio v. United States Army Corps of Engineers (In re EPA & DOD Final Rule), 803 F.3d 804 (6th Cir. Oct. 9, 2015).

[13] 82 FR 12532 (March 6, 2017).

[14] 82 FR 34899 (July 27, 2017).

> technologies have occurred since the MACT and to determine if their application to the source category is appropriate. (170-APF).

Because the standards may apply to sources that are subject to another set of rules (the New Source Performance Standards (NSPS), discussed below) a number of respondents have suggested there are opportunities to consolidate and rationalize the requirements of these two sets of regulations. In addition, there are also a series of perceived "unnecessary burdens" specifically related to NESHAPs.

A number of respondents expressed concern about the residual risk and technology reviews (RTRs) as leading to unnecessary additional requirements with no (or limited) environmental benefit. For example, NAM provided the following illustrative example for a sandblasting operation:

> For one manufacturer, this means having a dedicated employee climb on the roof of eight different manufacturing plants at the required interval (daily/weekly/monthly/quarterly) to do multiple 15-minute observations on each roof, and perform visual observations of the on-site sandblasting booth at the required interval, only to document that zero visible emissions occurred at every observed location during every monitoring event. Since 2011, this manufacturer has made over 700 visual observations consuming over 1,000 man-hours to comply with this regulation, despite having not once observed a "visible emission" at any of the plants. (146-NAM)

Another example provided was secondary aluminum production, illustrating how regulations that emerged from an RTR led to rules that did not reflect real world operating conditions. This rule required "hooding" for new "round top furnaces," which was impractical because they were incongruent with the charging method for this type of furnace which requires an overhead crane and lifting of the lid. (101-AA)

One set of Maximum Achievable Control Technology (MACT) rulemakings for a particular source category (MACT for industrial and commercial boilers and process heaters) has received particular attention in recent literature, and in the RFI responses. The rulemakings for this source category have occurred over the last 20 years, and are being reviewed based on a 2016 court decision, which is causing the EPA to consider additional "best performing boilers."[15] The length and complexity of the rulemaking process has created uncertainty for manufacturers.[16] In addition, specific requirements were identified by some respondents as burdensome, such as in the case of steel facilities:

> The requirement to test/tune/test each burner of each applicable source is a burdensome exercise. At many steel making facilities there are multiple finishing lines with indirect heating furnaces that are comprised of hundreds of natural gas fired burners each below 5 MMBTU/hour. These units are considered cumulatively under the Boiler MACT and are therefore required to have annual tune-ups per 40 CFR. § 63.7515(d). The annual tune-ups require excessive line outages and man

[15] See, https://www.epa.gov/boilers.

[16] Paul R. Noe, "Smarter Regulation for the American Manufacturing Economy," American Forest and Paper Association, September 14, 2016.

> hours. The annual requirement for testing and tuning of the many small burners can range up to $100,000 for a company with the time, equipment and proper skills to conduct the tuning. For natural gas sources with burner sizes less than a certain threshold, reducing the frequency of these tune-ups to every five years would significantly reduce the cost burden. (92-AISI)

Another MACT-related issue raised by respondents relates to the "once-in-always-in" policy.[17]

The Clean Air Act defines emissions limits for specific types of stationary sources. These New Source Performance Standards (NSPS) are specific to approximately 90 different industries/manufacturing processes. NSPS applies to "new, modified and reconstructed" facilities. As an example, there is a NSPS standard for volatile organic compounds (VOCs) for surface coating processes for large appliances.[18]

For NSPS, the specific regulatory burdens cited often were not the rules themselves, but the potential for overlap and redundancy with related rules, such as National Emissions Standards for Hazardous Air Pollutants (NESHAPS, discussed above). NAM and IECA specifically suggest there are opportunities to rationalize the NSPS and NESHAP requirements, reporting and recordkeeping. (146-NAM, 89-IECA) Both sets of rules limit emissions from specific manufacturing processes, suggesting that there may be opportunities to integrate the two standards. NAM gives a specific example of the opportunity to rationalize 8 different regulations for different coatings processes. (146-NAM)

More frequently mentioned were examples of enforcement reaching beyond explicit NSPS standards. (89-IECA, 92-AISI, 112-SMA) AISI gives the example of the EPA using enforcement actions to limit fugitive emissions of particulate matter in steel making facilities that are not explicitly delineated in the NSPS. (92-AISI)

Clean Air Act: New Source Review and Prevention of Significant Deterioration Permits

The New Source Review (NSR) permitting program under the Clean Air Act was cited in many of the RFI responses as one of the most important opportunities to streamline permitting processes for manufacturers. An NSR "preconstruction" permit is required for new industrial facilities (and other new "major sources") or for "major modifications" of existing facilities.[19] The objectives of the program are to protect air quality by limiting increases in emissions and by ensuring that "advances in pollution control technology occur" as part of industrial expansion. The NSR program has different requirements depending on whether facilities are in "attainment" areas that are meeting National Ambient Air Quality Standards (NAAQS) for six specific "criteria" pollutants, or whether they are in non-attainment areas. Permits that are required to be obtained in

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[17] Under the "once-in-always-in" policy, EPA requires that a major source, subject to the MACT technology standard, remains subject to that standard even if "the facility undertakes pollution prevention or installs control devices to reduce emissions below the major source applicability thresholds." (170-APF). That means a company is subject to a higher standard than is "justified" by their current emissions levels. Perversely, this creates a disincentive for companies to reduce emissions. (170-APF).

[18] New EPA NSPS for industrial surface coating for large appliances.

[19] For more information on NSR permitting, see www.epa.gov/NSR.

attainment areas are known as Prevention of Significant Deterioration (PSD) permits. Table 3 below outlines the broad requirements for NSR and PSD permits:

Table 3. Requirements for New Source Review and Prevention of Significant Deterioration Permits	
New Source Review (Nonattainment Area)	**Prevention of Significant Deterioration (Attainment Area)**
1. Installation of the Lowest Achievable Emission Rate or LAER ("meaning that the plant must install state-of-the-art pollution controls in order to match or exceed the emission rate achieved by the lowest emitting similar facility in the country") (48-AF)	1. Installation of the Best Available Control Technology or BACT (similar to LAER, but sometimes less stringent, and assessed on a case-by-case basis) (48-AF)
2. Emissions offsets (reductions) from other plants in the same area that yield a net air quality benefit for the region	2. An air impact analysis or modeling that demonstrates that the increase in emissions: 1) "will not result in changes in ambient air quality that would cause the area to exceed NAAQS for any pollutant, and 2) even if projected emissions will not violate NAAQS, they will not result in an increase in ambient concentrations of any pollutant that exceeds the allowable PSD 'increments' set by the CAA"
3. Alternative Sites Analysis	3. An additional impacts analysis (which "assesses the impacts of air, ground and water pollution on soils, vegetation, and visibility caused by any increase in emissions of any regulated pollutant" from the source)[20]
4. Opportunities for public comment	4. Opportunities for public comment
Sources: www.epa.gov/nsr, 48-AF, 92-AISI, 136-AFPM, EPA, Webinar Slides: Revisions to the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a GHG Significant Emission Rate (SER): Proposed Rule, September 20, 2016[21]	

[20] For more information on NSR permitting, see www.epa.gov/NSR.

[21] 81 FR 68110 (October 3, 2016).

The NSR/PSD permitting processes are perceived by RFI respondents to be unnecessarily cumbersome and lengthy. The time required to obtain a preconstruction permit, once an application is received, can range from 9 months to as much as 2-3 years. (48-AF, 170-APF) This duration does not include the months (or even years) required to prepare the application, nor does it include potential delays that can lengthen the process or make its timing uncertain, such as the need to revise air quality modeling when a NAAQS standard is changed, or the possibility of an appeal or review by the EPA of a state decision to issue a permit. (170-APF, 10-PCBI, 89-IECA)

Respondents indicated the costs to prepare an application and construct air quality and dispersion models are significant, not to mention the costs of emissions offsets and what is sometimes perceived as "over-investment" in pollution control equipment due to the conservative assumptions built into these models. The result is that manufacturers avoid making investments to modernize facilities, improve processes or increase quality for fear of triggering an NSR/PSD requirement. (146-NAM, 10-PCBI)

A number of recommendations have been put forward to address various issues that arise under NSR/PSD:

- Turnaround Time. One proposal is to enforce reasonable turnaround times. (48-AF) According to a recent paper,[22] under the CAA, "EPA and other permitting agencies are required to either grant or deny an NSR permit within one year of receiving a permit application, but there is no practical way to enforce this deadline." In addition to setting firm deadlines, other suggestions include:
    - Limiting challenges or appeals, including limiting the ability of the EPA to review or reject the decision of a state permitting authority. (89-IECA, 170-APF, 10-PCBI)
    - Allowing some construction activities to commence that do not generate emissions, prior to receiving a permit. (146-NAM)
- Aggregation. There are also a set of rules regarding the "aggregation" of emissions (within a facility, over time within a facility, or across locations) that affect whether the need for a NSR/PSD permit process is triggered. A number of respondents made suggestions or encouraged approaches that allow flexibility for sources to aggregate emissions and thus demonstrate that total emissions are not increasing sufficiently to trigger an NSR/PSD process. (In some cases this would involve clarifying rules or "solidifying" past reforms already proposed.) These recommendations include:
    - Plant-Wide Applicability Limitations (PALs) — EPA could promote and facilitate "Plant-Wide Applicability Limitations (basically emissions limits that apply facility-wide) through a

[22] Art Fraas, John D. Graham, and Jeff Holmstead, "EPA's New Source Review Program: Time for Reform? " Environmental Law Reporter, 1-2017.

permitting process, allowing such a facility to change, modify and upgrade equipment and operations and add new equipment without triggering major modification NSR review, provided the changes do not result in exceeding the established PAL emissions limits." (92-AISI quote, also 170-APF)

- Units that precede or follow the unit being modified should not be considered as part of emissions increases that might trigger NSR. (170-APF, 136-AFPM)

- Clarifying the rules around definition of a project, and whether separate activities can be grouped together into a project for purposes of triggering NSR/PSD. (170-APF, 136-AFPM, 146-NAM)

- Rules that Avoid Triggering NSR. There were also recommendations relating to the rules that trigger NSR, such as:

  - Revisiting and expanding the definition of activities that are defined as "routine maintenance, repair and replacement," which are exempted from NSR/PSD requirements. (92-AISI, 170-APF)

  - Using actual emission increases versus theoretical or maximum "potential to emit" in calculations. (10-PCBI, 136-AFPM)

- Modeling. Numerous respondents identified the need to avoid delays and re-work in the application and air quality modeling process. (Note that a more general discussion of NAAQS and modeling is found in the section below.) Recommendations include:

  - Introducing guidance on modeling at the same time as NAAQS standards are revised, so there is clarity on modeling required as part of an NSR application. (92-AISI, 48-AF)

  - "Grandfathering" NSR applications that were submitted, but not yet approved, prior to a change to NAAQS standards, so companies do not have to revise the applications to conform to the new standards. (92-AISI, 48-AF)

- BACT and LAER determinations. Several respondents offered suggestions about how to improve the process of determining the required pollution control technology, which is perceived to be onerous and susceptible to delays:

  - PSD BACT determination should be based on proven, domestic technology that is in the same "industrial category" as the applicant and was in existence when the application was submitted (92-AISI, 10-PCBI) and should consider alternatives to the "top down" BACT analysis process. (170-APF)

- Emissions Credits or Offsets. Respondents also raised concerns that there can be challenges in obtaining emissions credits in non-attainment areas, and when they are available they can be very expensive. In one example, a relatively small new facility in Houston (emitting more than 100 tpy of Volatile Organic Compounds or NO_2) may need to spend between $32 million and $52 million for emissions offsets. (48-AF) Recommendations by respondents include:

    - Increased flexibility for buying offsets from outside the local areas where a new facility is being established. (48-AF)

    - Emission fees versus credits (which would require a statutory change). (48-AF) A recent paper on EPA's NSR program stated: "We propose a narrow statutory reform that could address these issues while still obtaining most or perhaps even more of the environmental benefits of the current program: allow permit applicants to pay emissions fees in lieu of meeting the current offset requirements, and require the state or local environmental agency to use these fees to pay for or subsidize emissions reductions that the agency believes will do the most good in terms of reducing environmental risks."[23] (48-AF)

The other major permit required by the CAA (beyond NSR/PSD) is the Title V operating permit for major (and some minor) sources, which incorporates all of the federal and state air pollution control requirements in one place. (170-APF). The operating permit must be renewed every 5 years.

Industry respondents suggested that it has become costly to obtain, maintain and renew operating permits. (170-APF) AISI reported "varied timelines for completing the Title V review and approval process, depending on the state regulatory agency and EPA Regional Office, taking up to three years to receive the final permit and costs of several million dollars for each operating permit needed." (92-AISI) And according to the Air Permitting Forum, "the cost of the program today is far more than was ever anticipated...given the enormous costs of the program, it is incumbent on the government to take whatever steps it can to streamline permitting and minimize costs." (170-APF)

Concerns were also raised that even when an NSR/PSD preconstruction permit already has been obtained, the Title V permit process provides another opportunity for NGOs or others to mount a legal challenge "on the same grounds that have already been adjudicated." (170-APF) Moreover, "Title V petitions often sit in a long queue at EPA, and then can end up back in court—duplicating costs for industry to defend its expansive and long-evaluated permits." (170-APF)

A related problem is the concern that the operating permit, which is intended to consolidate various regulatory requirements, is being used (e.g., by states) to add additional requirements or impede flexibility in meeting other requirements imposed by the CAA (e.g., such as using the permit language to limit the options for an appliance surface coating operation in meeting MACT standards for hazardous air pollutants

[23] Art Fraas, John D. Graham, and Jeff Holmstead, "EPA's New Source Review Program: Time for Reform? " Environmental Law Reporter, 1-2017.

(HAPs), which otherwise would be able to meet requirements by changing materials or adopting controls). (170-APF)

In addition to an overall desire to streamline the approval process, specific recommendations include: eliminating the ability of EPA or other stakeholders to "re-litigate" preconstruction NSR/PSD permit decisions during the Title V permitting process (170-APF); extending the term of the permit from 5 to 10 years (170-APF); and citing other requirements in the permit rather than recreating or summarizing those requirements in their entirety in the permit itself. (170-APF)

Historically, the CAA has exempted Start-up, Shutdown and Malfunctions (SSM) periods from the emissions restrictions that apply under normal operating periods. However, in response to recent court decisions, the EPA has reversed course, and proposed new rules (in 2016) to eliminate these exemptions and eliminate the "affirmative defense" provision for emergencies. Numerous industry respondents have urged that the SSM exemptions be restored (89-IECA, 170-APF, 92-AISI):

> "Unless EPA acts quickly, every manufacturing company in the country operating under a Title V air permit could be subjected to unnecessary citizen suits and potential civil penalties as they shut down and start-up their equipment to conduct maintenance activities and other planned and unplanned outages." (89-IECA)

It has also been suggested that other alternative approaches could be explored, such as developing a more "judicially sound affirmative defense concept" or "re-promulgating technology based emissions standards sufficient to cover emissions associated with SSM events." (101-AA)

Clean Water Act: National Pollutant Discharge Elimination System Permits

Section 402 of the CWA — known as a National Pollutant Discharge Elimination System (NPDES) — requires a permit to discharge pollutants from a "point source" into "waters of the United States." "The permit will contain limits on what you can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health."[24] An NPDES Storm-water program also requires a permit for some storm-water discharges, which are not considered point sources. Also under the CWA, a section 404 permit may be required for the discharge of dredge or fill material into "waters of the United States." Section 404 is managed by the EPA and US Army Corps of Engineers.

A primary concern expressed by RFI respondents was the complexity of these permitting processes, and the time required to obtain a permit. According to AISI, "[t]he 404 permitting process is currently one of the most ill-defined processes for a regulated party to understand and thus to predict permit timelines." (92-AISI). Respondents reported that Section 404 permits can take 1-4 years or more to obtain and NPDES permits require 6 months or more. (92-AISI) In reference to wetlands (Section 404) permitting, SMA stated

[24] See www.epa.gov/npdes for more information on the Section 404 permitting process.

that "USACE [US Army Corps of Engineers] permitting processes are slow, antiquated and expensive." (112-SMA) And regarding NPDES, the Aluminum Association's assessment is that the "antiquated permitting timeline embedded in these regulations costs business money and lost opportunities for growth." (101-AA)

Some of this long permitting cycle is driven by the complexity of the law and the permitting process, which requires permits for industrial discharges from point sources, often based on effluent guidelines for specific industrial processes (which are sometimes complicated by Total Maximum Daily Load limits on the amount of "pollutant a waterbody can receive"); a separate permit process for discharges that go into publicly owned treatment works (POTWs), for storm water, and for wetlands; a set of requirements for cooling intake water; and significant operational proscriptions and recordkeeping/reporting. (See www.epa.gov/npdes and 92-AISI; 112-SMA; 136-AFPM; 101-AA)

The recommendations by respondents generally revolve around streamlining the process, eliminating duplicative requirements, making the steps to obtain a permit more defined (with fewer open-ended steps), and shortening the process timeline. (92-AISI, 101-AA, 76-Boeing)

Clean Air Act: Greenhouse Gas Requirements

Greenhouse Gas (GHG) emissions are now regulated under the CAA, using PSD and Title V permitting processes.[25] The objective was to introduce "GHG emissions thresholds that define when permits under these permitting programs were required" for new or modified sources.[26] Litigation has caused a revision of the rules, which is still in progress.[27] The primary result of the decision was that the EPA "may not treat GHGs as an air pollutant for the specific purpose of determining whether a source is required to obtain a PSD or Title V permit."[28] In other words, a "BACT analysis for GHGs" is only required in cases "where another air pollutant triggers a review" and the requirement to obtain a PSD or Title V permit. (136-AFPM) A revised rule has been proposed, and final comments were due in December 2016.

Nevertheless, for major sources that require Title V and PSD permits for another pollutant, EPA can apply BACT requirements to GHGs above a specific threshold, which has been proposed at 75,000 tons per year (tpy) CO2e Significant Emission Rate (SER). The court decision referred to above also requires a justification for this threshold level. There is concern among a number of RFI respondents that this threshold level of GHG emissions is too low, and that the benefit in terms of a reduction in GHG emissions

[25] The EPA's original Greenhouse Gas Regulations consisted of the "Endangerment Finding" (74 FR 66523 (2009)), the "Triggering Rule" (75 FR 75004 (2010)), the "Tailpipe Rule" (75 FR 25324 (2010)), and the "Tailoring Rule" (75 FR 31514 (2010)).

[26] EPA "Revisions to the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a GHG Significant Emission Rate (SER): Proposed Rule," Webinar, Sept. 20, 2016.

[27] *Utility Air Regulatory Group v. EPA; Coalition for Responsible Regulation v. EPA.*

[28] EPA "Revisions to the Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas (GHG) Permitting Regulations and Establishment of a GHG Significant Emission Rate (SER): Proposed Rule," Webinar, Sept. 20, 2016.

would not justify the additional regulatory burden. (89-IECA, 136-AFPM) Respondents, therefore, recommend the EPA prioritize an expedited and judicious review of SER thresholds for GHGs.

Clean Air Act: National Ambient Air Quality Standards

The EPA establishes National Ambient Air Quality Standards (NAAQS) for six "criteria" air pollutants (carbon monoxide, ozone, lead, nitrogen dioxide, particulate matter, and sulfur dioxide). Regions are designated as "attainment" areas (which meet the NAAQS standards), non-attainment regions, or unclassified. Non-attainment regions are considerably more restricted in allowable emissions, thus limiting the potential for new manufacturing plants and plant expansions. NAAQS standards have been continually ratcheted downward; the 2015 ozone regulation established a standard of 70 parts per billion (ppb), which revised a 2008 standard of 75 ppb that has not yet been fully implemented.[29] (89-IECA, 136-AFPM) At 70 ppb, respondents raised concerns that the level is approaching "background" levels of ozone. (48-AF,146-NAM, 112-SMA) Respondents also raised concerns that the pace at which the standard has been revised has not allowed sufficient time for implementation, and is further complicated by measurement and (again) air quality modeling issues — in particular accounting for ozone transported from international sources. (112-SMA,107-COC) As noted in a recent paper:

> Recent research has found that stratospheric intrusions and long-range transport—particularly in western states—have resulted in daily maximum eight-hour ozone levels of 70 ppb or more. With the ozone NAAQS at or below background, sources will find it impossible to show that they will not "contribute to" a violation of the standard. (48-AF)

Some observers recommended that implementation be delayed.[30]

Because of this increasingly restrictive standard, respondents specifically raised concerns that the current NAAQS standard for ozone is not practicable to implement, will shift numerous areas into a non-attainment designation, and will severely restrict the ability of manufacturing companies to establish new facilities or expand existing facilities in those regions. (136-AFPM, 112-SMA, 89-IECA)

Because of this narrow margin, numerous respondents identified the need for EPA to improve air quality and dispersion models. For example, one respondent stated:

> In conducting an analysis for the PSD program, facilities must use EPA-approved models to demonstrate that a project will not cause a violation of a NAAQS standard. The models' overly conservative algorithms and assumptions, however, can create a modeling result that rarely represents and often significantly overestimates monitored concentrations around the facility.

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[29] A NAM-NERA 2014 report assessed the impact of a more stringent 60ppb standard that was contemplated at the time, and the analysis suggested the economic impact would be enormous: "...the potential emissions control costs would reduce U.S. Gross Domestic Product (GDP) by $270 billion per year on average over the period from 2017 through 2040... The potential labor market impacts represent an average annual loss of 2.9 million job-equivalents." (NERA Economic Consulting, "Assessing Economic Impacts of a Stricter National Ambient Air Quality Standard for Ozone," Prepared for NAM, July 2014). In contrast, the EPA estimated costs of $560M for what appears to be the final rule of 70ppb. (OMB, "2016 Draft Report") .

[30] 146-NAM, Letter to National Economic Council, regarding regulations of concern, Business Roundtable, February 22, 2017.

> Reliance on modeling that over-predicts ambient concentrations can result in additional unwarranted costs by causing facilities to install beyond-BACT pollution control equipment, even though the assumptions used in the models and the predicted concentrations are not representative of real-world conditions. (170-APF)

Some of the specific suggestions to improve the approach involved re-examining assumptions about background concentration levels, the treatment of fugitive emissions, use of actual emissions rather than theoretical or maximum operating rates, employing probabilistic models, and reconsidering inappropriate "ambient air receptor" locations where individuals will not generally be exposed to emissions. (89-IECA, 92-AISI, 170-APF, 112-SMA, 136-AFPM)

Others recommended that changing the timetable for mandatory NAAQS reviews from every five years to every ten years would allow more time to meet the previous standard. (107-COC, 136-AFPM, 10 PA) In addition, the CoC notes that these "five-year deadlines are regularly exceeded by the EPA and inevitably result in 'sue-and-settle' agreements." Five-year review cycles have the potential to result in over regulation and constant changes requiring capital outlays from the private sector. Implementing the respondent's recommendation would require Congress to update the NAAQS review schedule to reflect a 10-year cycle. This update would allow for complete realization of environmental improvements, and would bring greater certainty to regulated operators.

Another frequent recommendation raised by respondents is to re-examine and clarify how to account for international and long-range transport of ozone, and for exceptional events. For example, the EPA has a policy which would allow it to "disregard exceedances of a NAAQS caused by certain types of exceptional events," such as stratospheric intrusions. However, it was suggested that in practice it is difficult to obtain EPA "recognition" of exceptional events in an NSR application. (48-AF) In light of this phenomenon, where meteorological conditions play a role in transporting extra-jurisdictional emissions, EPA should exclude those emissions from regulatory consideration, classifying them as "exceptional events." Respondents recommend that EPA employ all tools available to discount for "background" conditions and allow the maximum degree of flexibility afforded by statute.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) is a set of laws, regulations and policies that govern management and cleanup of solid, liquid, and gaseous hazardous waste.[31] Manufacturers are affected by RCRA because of the generation of waste streams in their factories. An issue identified by several respondents is the inappropriate classification of certain waste streams as hazardous, which impose burdensome additional requirements, and have the effect of discouraging recycling, reuse or reclamation. (146-NAM) For example, AISI has proposed that baghouse dust from electric arc furnaces (EAFs) be delisted as hazardous, which would open up additional recycling or reuse opportunities (without always employing an RCRA-permitted recycling operator). SMA similarly suggested that by-products from EAFs

[31] For more information, see https://www.epa.gov/rcra.

are sometimes classified as hazardous, resulting in more complex and burdensome management requirements, which again undermine the goal of recycling. (112-SMA) In 2015, EPA has added a restrictive criterion for "legitimacy" which results in unnecessary treatment and disposal of material that could be reused or recycled for other purposes.[32] Respondents recommend updating the rule to allow for more beneficial uses of substances where reuse or recycling can be justified by industry. Additionally, another respondent proposed an aggressive approach to delisting waste as "hazardous," where appropriate, which would reduce regulatory burden. (76-Boeing)

On November 28, 2016, the EPA published the Hazardous Waste Generators Improvement Rule.[33] According to 89-IECA it "causes waste generators who violate even one 'Condition for Exemption' from permitting to be treated as [full-fledged] waste treatment, storage, and disposal facilities requiring RCRA permits. Violation of a single minor condition can, therefore, mean that an otherwise exempt facility must obtain a RCRA permit and can be cited for violations of numerous regulations and permit conditions" (136-AFPM) or be subject to more onerous regulations. (89-IECA) It is recommended the rule be revised to allow some leeway on conditions of exemption and associated violations.

Risk Management Programs

Section 112(r) of the Clean Air Act addresses the prevention of accidental releases of hazardous substances. Respondents raised concerns that EPA's recently issued Risk Management Plan (RMP) rule (40 CFR, Part 68, finalized in 2017), which would add unnecessary or unreasonable additional burden for affected facilities.

For example, there is significant concern about duplication and conflicting requirements under the rule with Occupational Safety and Health Administration (OSHA) Process Safety Management standard. (136-AFPM, 43-Mosaic, 133-PIA) In addition, several elements of the new requirements were perceived as unnecessary or inflexible. One such area is the requirement for third party audits in certain circumstances (such as chemical release or instance of non-compliance). (136-AFPM, 109-Valero) One respondent suggested appropriately trained internal staff could perform audits, and also suggested the qualifications for third party auditors outlined in the regulations were too restrictive. (158-CKRC) An additional requirement highlighted was the need for a "resource-intensive inherently safer technology analysis" that according to one respondent "provides little value after a facility is already built" (136-AFPM), and which another respondent said will "increase compliance costs without improving safety." (109-Valero) Finally, several respondents expressed concern about reporting requirements that would release sensitive information that could be used for lawsuits or potentially even terrorist attacks. (146-NAM, 109-Valero, 136-AFPM) Legal action has been taken seeking reconsideration of the rule. (136-AFPM) On March 13, 2017, the EPA convened a proceeding to reconsider RMP Rule.[34] On June 14, 2017, the EPA published a final rule to

[32] 80 Fed. Reg. 1693-1814 (Jan. 13, 2015), revising 40 CFR. Parts 260 & 261.

[33] 81 FR 85732 (November 28, 2016).
[34] 82 Fed. Reg. 13968 (March 16, 2017).

further delay the effective date of the RMP Rule for 20 months until February 19, 2019, to allow adequate time for the reconsideration.[35]

Toxic Substances Control Act

The Toxic Substances Control Act of 1976 (TSCA) provides EPA with authority to require reporting, record-keeping and testing requirements, and to impose restrictions relating to chemical substances and/or mixtures. Certain substances are generally excluded from TSCA, including, among others, food, drugs, cosmetics and pesticides. The types of chemicals regulated by TSCA fall into existing (chemicals on the TSCA Inventory) and new, which is an important distinction as TSCA regulates each category differently. For new chemicals, manufacturers must submit a pre-manufacturing notification to EPA prior to manufacturing or importing new chemicals for commerce. TSCA also specifically addresses the production, importation, use, and disposal of specific chemicals including polychlorinated biphenyls (PCBs), asbestos, radon and lead-based paint. The most common issue with TSCA expressed by the respondents was the restrictions imposed on manufacturing and use of chemicals that have the potential to drastically and unnecessarily impact profit, productivity, competition and jobs. (37-ILMA, 39-IPC, 51-NSSGA, 56-CPA, 101-AA, 115-HSIA, 116-NAFO, 141-ACC, 151-PESA, 155-PMPA) It should be noted, however, that on June 22, 2016, the Frank R. Lautenberg Chemical Safety for the 21st Century Act, which amended TSCA, was signed into law, addressing some of the shortcomings in the original law and adding a mandatory duty to evaluate chemicals and a new risk-based safety standard.

Improve Tracking of Workforce Injuries and Illnesses

In May 2016, the Occupational Safety and Health Administration (OSHA) published its final rule to "Improve Tracking of Workplace Injuries and Illnesses."[36] However, manufacturers are concerned that this rule requires them to submit electronic records of workplace injuries and illnesses, which OSHA is planning to post on a public website. (92-AISI, 146-NAM, 107-COC) RFI respondents have voiced two objections to making the data publicly available: 1) the information may be used by union organizing campaigns, or as the basis of litigation on safety issues; 2) privacy concerns exist, as there may be identifying information included in the reporting that could expose sensitive, proprietary information. (92-AISI, 146-NAM, 107-COC) Also, there are requirements for establishing a reasonable system for workers to report injury or illness, along with provisions that prevent employers from retaliating against whistleblowers or in other ways discouraging injury or illness reporting.

Guidance issued on how to comply with the rules included language that suggested some safety performance incentives and drug testing programs might be construed as in violation of the rule, as they might deter reporting (to improve safety performance measures or to avoid post-accident drug testing).

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[35] 82 Fed. Reg. 27133 (June 14, 2017).
[36] 81 FR 29623 (May 12, 2016).

(107-COC; 92-AISI; 39-IPC) Respondents would like the plan to post safety data online to be reconsidered, and to clarify the guidance so that it does not undermine safety incentive and drug testing programs.

Endangered Species Act

Specific concerns raised relating to the Endangered Species Act (ESA) fall primarily into three categories. First, federal agencies issuing permits must consult with the U.S. Fish and Wildlife Service when construction may affect an endangered or threatened species; this consultation adds considerably to permit time and complexity. (51-NSSGA, 84-Ameren, 114-AGC, 136-AFPM) Second, due to high volume, ESA rules such as the 2016 Critical Habitat Designations, have become "unreasonable." (86-IPAA, 114-AGC, 144-AFPA, 146-NAM, 152-AWC) Finally, concerns were raised that the ESA is being exploited by project opponents as a means of blocking permits. (75-SLMA, 107-COC, 126-API)

Conflict Minerals and Dodd-Frank

Section 1502 of the Dodd-Frank Act[37] mandates that the U.S. Securities and Exchange Commission (SEC) create rules[38] that require public companies that use conflict minerals (tantalum, tin, gold or tungsten) in the manufacture of their products to "undertake 'due diligence' on the source and chain of custody of its conflict minerals and file a Conflict Minerals Report" and publicly disclose this information.[39] The concern is that the mineral may have come from or near the Democratic Republic of the Congo and its use, therefore, is contributing to a humanitarian crisis. A significant issue is that the due diligence requirement is directed back on to suppliers, which are often small to medium sized manufacturers who cannot easily comply with this burden. (53-ACMA, 120-NTMA/PMA, 137-MEMA, 146-NAM) One respondent noted that both the Department of Commerce and the SEC stated they lacked the expertise in this type of back-to-the-mine-of-origin investigation, and given this, asks how small firms can be asked to do these types of investigations. (120-NTMA/PMA)

According to NAM, the "SEC estimates that it will take the average manufacturer 480 hours annually to comply with this regulation."[40] Another association stated, "a large Tier 1 supplier estimated that their expenditures have totaled about $3 million since the annual reporting requirements took effect. These costs include tracking the supply chains and processes of over 7,000 lower tier suppliers, evaluating the minerals tracking efforts of all suppliers, and categorizing the likelihood that a supplier's products contain conflict minerals. Additional costs are incurred because all findings from the company's suppliers must be manually entered into a database and categorized so that the information provided may be utilized by the Tier 1

[37] PL 111-203, Dodd-Frank Wall Street Reform and Consumer Protection Act, July 21, 2010.

[38] 17 CFR 240 and 249b.

[39] SEC Fact Sheet, https://www.sec.gov/cpa/Article/2012-2012-163htm---related-materials.html.

[40] National Association of Manufacturers, "Holding US Back: Regulation of the U.S. Manufacturing Sector," prepared by Pareto Policy Solutions, LLC.

supplier in preparing filings."(137-MEMA) Many respondents suggested that the rule be suspended. (14-Chromaflo, 39-IPC, 53-ACMA, 71-Whirlpool, 107-COC, 120-NTMA/PMA, 137-MEMA; 146-NAM)

A second SEC issue was the CEO pay ratio disclosure provision required by Section 953(b) of the Dodd-Frank Act. This provision calls for public companies to disclose the ratio of employees' median pay to the compensation of a company's chief executive officer. The SEC finalized a rule for this provision in August 2015, and it becomes effective in 2018. NAM notes that this ratio is a "false and overly simplistic" metric of company compensation practices and it is burdensome due to the costs associated with calculating median pay. (146-NAM) The U.S. Chamber echoes those concerns and notes that some municipalities are "enacting a new tax based upon this ratio." (107-COC) NAM asks that the SEC reconsider the rule entirely.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) requires that federal agencies consider significant environmental impacts in their decision-making, and established the President's Council on Environmental Quality (CEQ). Federal law requires permits for many kinds of industrial and commercial activity, and the issuance of such permits often triggers a requirement for NEPA analysis. This process can quickly become extremely lengthy and costly. For example, according to NAM:

> It (the NEPA) is often the largest, costliest, most time-consuming regulatory hurdle that project sponsors, developers, construction managers and engineers face before they can build. Philip Howard's 2015 report, "Two Years, Not Ten Years: Redefining Agency Approvals" explains that public project costs are increased by more [than] $3.7 trillion because of red tape. It is also a common target for abuse, as there are countless ways for federal and state agencies and external actors to throw a wrench in the process and delay completion of the review. The longer the delay, the more likely the developer walks away. Project opponents do not often need a [court] judgment on the merits of NEPA to win; the delay can be enough... A 2014 GAO report made several startling findings with respect to the administration of NEPA. [GAO found that the] Administration had no idea how long a typical NEPA review takes. GAO's best guess was an analysis by the National Association of Environmental Professionals (NAEP), which estimates that the average environmental impact statement (EIS) under NEPA takes 4.6 years, the highest it has ever been. NAEP also estimated that the time to complete an EIS increased by 34.2 days each year from 2000 to 2012. (146-NAM)

Another respondent wrote that, with respect to individual permits under CWA Section 404 for dredge and fill activities, this "process can take 4 years even if a full Environmental Impact Analysis is not required." (43-Mosaic) Other respondents also discussed the increased costs and significant manufacturing and construction delays as a result of NEPA. (10-PCBI, 42-Novelis, 43-Mosaic, 46-ATT, 71-Whirlpool, 83-TM, 86-IPAA, 96-NMA, 101-AA, 114-AGC, 115-HSIA, 125-BP, 136-AFPM, 146-NAM, 159-VI, 172-VI)

Regional Haze Requirements

In 1999, the EPA announced a major effort to improve air quality in national parks and wilderness areas. The Regional Haze Rule (RHR) calls on states, in coordination with the EPA, the National Park Service, U.S. Fish and Wildlife Service, the U.S. Forest Service, and other interested parties, to develop and implement air quality protection plans to reduce the pollution that causes visibility impairment. In 156 national parks and wilderness areas such as the Grand Canyon, Yosemite, the Great Smoky Mountains and Shenandoah National Park.

One of the most significant concerns with the RHR is that the requirement to reach "natural conditions" in visibility (defined as visibility in pre-industrial America) in the National Parks by 2064 may be unreasonable given the global nature of air quality and current operation and needs of our society. (148-TSGTA; see also 69-Domtar, 86-IPAA, 89-IECA, 100-ACA, 101-AA, 102-Renfro, 123-3M, 125-BP, 170-APF) To reach natural conditions, the EPA has been implementing restrictions in NOx emissions and emissions from electric generators, and forcing states to impose high cost, low benefit pollution controls. In doing this concerns were raised that EPA is interfering with implementation of this rule, for which States have the primary role in determining how best to make emissions reductions and define their own 'glide-path' to achieving the goal.

Crystalline Silica Standard

Silica can be found in a number of manufacturing operations, including foundries, glass making, paint manufacturing, porcelain manufacturing, and brick manufacturing. (107-COC) In 2016, an OSHA rule was finalized[41] which cut in half the permissible exposure to crystalline silica (for general industry and maritime) from 100 to 50 micrograms per cubic meter.[42] Compliance is required within 2 years after the effective date (2018).

Industry respondents suggest the standard is simply too stringent and will be difficult, costly or impossible with which to comply. According to NAM the rule requires "extensive and costly engineering controls...exposure monitoring, medical surveillance, work area restrictions, clean rooms and recordkeeping" (146-NAM) Respondents also state that the standard "could force manufacturers to shut their doors" or "could potentially cause several types of manufacturing to leave the United States." (146-NAM, 107-COC) The U.S. Chamber of Commerce indicates that the previous standard was highly effective, reducing deaths from exposure to silica by over 93% since 1968, and this new standard is being challenged in court (to determine if OSHA demonstrated "significant risk," and whether compliance with the rule "is technologically and economically feasible" — a "statutory requirement for an OSHA standard)." (107-COC) Respondents have suggested that the rule should be rescinded or reviewed.[43] (146-NAM, 107-COC)

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[41] 81 FR 162885 (March 25, 2016).

[42] Paul R. Noe, "Smarter Regulation for the American Manufacturing Economy," American Forest and Paper Association, September 14, 2016.

[43] 146-NAM, 107-CoC, NFIB, Problem Regulations, January 24, 2017.

Department of Labor Overtime Rule

The new overtime rule raises the salary level required for exemption from overtime pay of salaried white collar employees from $23,660 to $47,476.[44] A number of respondents suggested that the salary level for this exemption was too high, the rule exceeded statutory authority, and the automatic escalation of this salary threshold over time would be too rapid. (146-NAM, 6-NFIB, 39-IPC, 107-COC, 120-NTMA/PMA) The rule has been preliminarily enjoined by a district court, and the federal government has appealed this decision.[45]

Comprehensive Environmental Response, Compensation, and Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act's (CERCLA) major emphasis is on the cleanup of inactive hazardous waste sites. CERCLA gives the President authority to clean up or ensure the cleanup of these sites through "removal" and/or "remedial" actions, generally referred to as "response" actions, to address threats to human health and environment. CERCLA provides for cost recovery from potentially responsible parties, including current and former owners and operators of the facility, along with parties that arranged for or transported hazardous substances to the facility. Agencies provide oversight when the cleanup is pursuant to an agency order or a federal consent decree. The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) outlines CERCLA's implementing regulations. Agencies follow the procedures and standards detailed in the NCP when remediating these sites.

RFI respondents raise concerns that CERCLA requirements can be extremely expensive and duplicative with other regulations. (84-Ameren, 92-AISI, 96-NMA, 101-AA, 110-Freeport, 111-GAC, 131-NMMA, 159-VI, 160-TCC) As a separate point, one respondent further stated, "under this policy, EPA routinely requires cooperating private parties to pay for duplicative and unnecessary expenses that the Agency incurs—in addition to the substantial expenditures the private parties are already undertaking in order to remediate the site. EPA's duplicative oversight activities not only increase costs, but also impede the pace of remediation by adding layers of unnecessary review. In 2015, EPA billed private parties $106.4 million for agency oversight—a substantial amount of overhead costs and resources that are better spent directly on cleanup activities."[46]

Spill Prevention, Control, and Countermeasures

EPA, within the CWA, requires non-exempt facilities to prepare Spill Prevention, Control and Countermeasure (SPCC) plans to prevent the discharge of oil from non-transportation related onshore and offshore facilities into U.S. navigable waters or adjoining shorelines. The SPCC rule applies to owners or operators of non-transportation related facilities who drill, produce, store, process, refine, transfer,

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[44] For more information, see https://www.dol.gov/whd/overtime/final2016/.

[45] *Nevada v. DOL*, E.D. Tex., No. 4:16-cv-00731, *motion granted* 11/22/15.

[46] U.S. Environmental Protection Agency, Superfund Remedial Annual Accomplishments, "Fiscal Year 2016 Superfund Remedial Program Accomplishments Report."

distribute, use or consume oil or oil products that meet at least one of the capacity thresholds and have the potential to discharge oil to U.S. navigable waters or adjoining shorelines.

One primary concern with SPCC is the overlap with other federal regulations. The most frequently raised overlap mentioned was the duplication of the SPCC with the Stormwater Pollution Prevention Plan (SWPPP). The duplicative effort required by these two regulations adds costs to the manufacturer and delays construction and operations. (37-ILMA, 76-Boeing, 101-AA, 106-AFS, 107-CoC, 114-AGC, 127-PCA) According to one respondent, "construction site operators are required to develop plans for preventing, containing, and cleaning up oil spills under the NPDES and SCPP regulations. If a construction site operator has a SWPPP that addresses oil storage and spill control, containment and cleanup measures, then EPA should allow the jobsite SWPPP to also satisfy the agency's SPCC requirements. Otherwise, this is double regulation — and each plan carries significant costs for the contractor to develop. The list of overlapping requirements includes documentation, management certification, site maps and diagrams, inspection and maintenance, recordkeeping, training, designated employees, notification procedures and response obligations. The U.S. Coast Guard also is involved in spill plans if the project is on/over water, which add further delays."

Equal Employment Opportunity Commission Reporting Requirements

The Equal Employment Opportunity Commission (EEOC) recently revised its EEO-1 reporting requirements so that beginning in 2018 employers must submit more comprehensive and detailed information that will be used to enforce prohibitions against employment discrimination and address discriminatory pay practices. Employers with 100 or more employees (both private industry and federal contractors) will be required to submit data on employees' W-2 earnings and hours worked by ethnicity, race, and sex, sorted into 10 job categories. Responding organizations are concerned with the additional time and resources that they will need to spend on this form and estimate that the number of reported entries will increase from less than 200 data points to over 3,000. (107-COC, 137-MEMA, 119-AGC, 77-CIRT, 66-ARTBA, 37-ILMA) Furthermore, responding organizations do not believe that the expanded data collection will provide useful information needed to enforce discriminatory pay practices. (107-COC, 137-MEMA, 119-AGC, 77-CIRT, 66-ARTBA,37-ILMA) Finally, the additional reporting may put a company at risk of publicly disclosing employees' private information and/or proprietary company information. (146-NAM, 66-ARTBA, 37-ILMA)

Food Safety Modernization Act

Over the last several years, the Food and Drug Administration (FDA), part of the Department of Health and Human Services (HHS), has issued several regulations to implement the Food Safety Modernization Act (FSMA). Some portions of the new regulations are complex, and a misinterpretation could cause potentially negative consequences for a company. One such regulation, Mitigation Strategies to Protect Food Against Intentional Adulteration (IA rule), is aimed at preventing intentional adulteration of food

intended to cause wide-scale harm to public health, including acts of terrorism targeting the food supply.[47] The regulation imposes significant new requirements on manufacturers of human food, including maintaining certain records. FDA should delay the compliance dates for the IA rule until it has revised the regulation to provide for more flexibility and greater focus on risk-based methods of preventing intentional adulteration of the food system. (98-IDFA)

As manufacturing and agricultural processing continually evolves, the FDA should ensure that regulatory requirements are flexible and able to adapt to science and innovation. Many agriculture processing companies sell secondary products (e.g., germ, feed, meal) from facilities which were not designed to handle these ingredients using the same standards for ingredients intended for human consumption. In the new FSMA foundational regulations, "manufacturing/processing" has been broadly defined around different activities conducted on food. The "farm" has a narrower definition. As a result, numerous activities that farms normally use to prepare a food crop for trade as Raw Agricultural Commodities (RAC) can be considered activities that transform the crop into a "processed food." A farm conducting these activities could be considered a manufacturer/processor and would be subject to food facility registration and to new requirements for "good manufacturing practices" and preventive controls. Current regulations will require some manufacturers to update facilities or adjust business practices to comply with good manufacturing requirements. There is a concern that such requirements are unnecessary and will result in lost jobs and lost opportunities for manufacturers. (146-NAM, 122-AHPA)

Additionally, the FSMA requires sellers (farmers and food processors) to obtain from their customers (downstream food processors and distributors) certain "written assurances" on an annual basis. With these written assurances in place, the sellers are provided a certain amount of regulatory relief — relief which in many cases is essential to the continued existence of their business, since according to respondents it is nearly impossible (not just inefficient or uneconomical) for the firm otherwise to comply with the applicable regulations. An analysis by the Grocery Manufacturers Association (GMA) determined that just the provisions in 21 CFR § 117.136 would require individual firms to obtain thousands or even millions of assurances every year. Therefore, the FDA should remove these unnecessary and burdensome provisions from the regulations. (70-GMA)

Commenters raised other concerns about FDA regulations, such as the Nutrition Labelling Standards. To provide consumers with clearer nutritional content information for food, based on updated nutrition research and public health information, the FDA issued a regulation in May 2016[48] that would require changes to the Nutrition Labeling, 21 CFR. §101.9 and Reference Amounts Customarily Consumed Per Eating Occasion (serving size) regulations, 21 CFR. § 101.12. These changes represent the first major update to the Nutrition Facts label in over 20 years and would require a massive overhaul to the food package label and information provided to consumers. FDA provided food manufacturers until July 26, 2018 to make this change even though FDA's own Regulatory Impact Analysis for this change estimated the cost to industry to comply in two years would be $4.6 billion, whereas the cost to comply in four years would be $2.8 billion.

[47] 81 FR 34165 (May 27, 2016).
[48] 81 FR 33741 (May 27, 2016).

In other words, just extending the compliance deadline from two to four years saves $1.8 billion. The challenge of compliance is compounded because FDA has yet to issue final guidance on the types of dietary fiber it considers to meet the new definition, 21 CFR §101.9(c)(6)(i), and information on calculating added sugars for some types of food, 21 CFR § 101.9(c)(6)(iii), which must be listed in the new label format. Additionally, the USDA is mandated by law to issue a regulation requiring the disclosure of the content of genetically modified ingredients in all foods by July 29, 2018, three days after the compliance deadline for the Nutrition Facts updates. FDA should extend the compliance date for this labeling update until May 2021 to ease the regulatory burden. Additional compliance time would allow companies to coordinate labeling updates, provide consumers with clear information to help them make healthy choices and avoid wasteful spending on duplicate relabeling schemes that would be required during the next four years. Additionally, USDA and FDA should work together on timing of compliance with these required changes so that manufacturers will only be required to make one label change. (98-IDFA, 146-NAM, 122-AHPA, 70-GMA, 74-Knouse) Other regulatory redundancies should also be eliminated between FDA, USDA, EPA, and other federal agencies. (53-ACMA, 74-Knouse, 64-TFI, 85-NOPA)

Overview of Regulatory Reform

Over the years, much effort has been spent on regulatory reform by think tanks, industry associations, and government agencies. Yet, for several reasons, the burden for manufacturers continues to grow. Through the process of writing this report it became clear to the Department that at the manufacturing plant level, there are significant opportunities for burden reduction. Respondents provided numerous examples of impractical, unrealistic, or onerous requirements and of processes that make permitting unnecessarily complex and time consuming.

Regulators and manufacturers working together can eliminate unnecessary regulatory burdens. These unnecessary burdens can be eliminated if regulators work with industry to apply commonsense and practicality to regulations and requirements to more closely reflect real world operating conditions. Responses revealed the need to reform the permitting process and existing rules and to reduce the current compliance burden without impacting benefits. Responses to the RFI revealed the need to also reform the process for new rulemakings.

Past Attempts at Regulatory and Permitting Reform

Over the years there have been many regulatory reform efforts. Prior reform efforts have prescribed principles for effective rulemaking, including the use of cost-benefit analysis (CBA), examining alternatives to regulations, and retrospective reviews. Yet the regulatory burden has only grown more onerous.

Factors that have undermined prior reform efforts include: indeterminate and underdeveloped cost-benefit models, methodologies and assumptions; a lack of agency effort to comply fully with all rulemaking requirements; and a lack of power and resources in oversight organizations to compel compliance with these principles.

Agency cost-benefit analyses sometimes lack transparency and make self-serving assumptions regarding important direct and readily quantifiable costs. Moreover, technically challenging and resource-intensive intangible, indirect, and cumulative impacts are often not meaningfully addressed. This includes opportunity costs such as impacts on innovation and productivity, despite the potentially far-reaching benefits.

Regulatory reforms also have required the consideration of alternatives — including market-based incentives (rather than a command and control approach). Despite these efforts, agencies tend to make assumptions that cast the politically preferred alternative in a favorable light. As a result of these factors, the cost-benefit models often fail in certain circumstances to capture the true costs of implementing regulation. For some important federal regulations (e.g., listing a species under the Endangered Species Act), a cost-benefit analysis is not required at all.[49]

Moreover, current application of principles of regulation often results in unnecessary, unreasonable, outdated, and impractical requirements that are of concern to manufacturers. Agencies frequently attempt

[49] Independent regulatory agencies are not required to provide a cost-benefit analysis.

to skirt the federal requirement to "maximize net benefits" prescribed in EO 12866[1] by over-weighting of qualitative benefits to justify quantitative costs. "Real-world" impacts of regulatory burdens are in many cases not adequately addressed. Regulatory agencies too often are not sensitive to concerns from manufacturers about overly cumbersome constraints and costs, a failure of agency culture and leadership.

The Need for Collaboration between Regulators and Manufacturers

Respondents provided a multitude of examples of unnecessary compliance burdens. Our review is not able to evaluate the substance of all the complaints or the soundness of all recommended solutions, but the large number of examples suggests there is a significant opportunity for regulatory reform.

Rather than consider the retrospective review process as a re-confirmation of the validity of a regulation, agencies should adopt the practice of working together with the regulated community — manufacturers, in this case — to understand real world burdens (including unintended ones) and to devise potential alternative, commonsense solutions collaboratively. Given the myriad challenges in creating a good rule, lookbacks with stakeholders could give agencies another opportunity to work toward the goal of avoiding regulations that impose unwarranted burdens.[50]

This suggestion fits with EO 13777[51]: "In performing the evaluation [of existing regulations], each Regulatory Reform Task Force shall seek input and other assistance... from entities significantly affected by Federal regulations..." In addition, former Office of Information and Regulatory Affairs (OIRA) head Cass Sunstein recently wrote: "Because the White House itself lacks the capacity to scrutinize the stock of existing regulations, the Trump administration was smart to call for task forces within each agency to do that — and to require them to engage with the public to see which regulations are really causing trouble."[52]

This is also very much in line with other nations' reform policies in which government works with the regulated community to identify unnecessary burdens. As one former UK government official said, "In the UK, by focusing on how we regulated, rather than just what we regulated, we were able to drive enormous cost reductions without sacrificing protections. By simplifying forms and processes, compliance became much less costly without any underlying regulatory changes or compromising mission."[53] This official also observes that the cultural change required to accomplish this reform should not be underestimated: "Those who work in regulatory policy often focus on designing new regulatory ideas. Typically, they don't systematically look for ways to reduce the costs of regulations that are already on the books."

RFI respondents also call for agencies to review existing regulations with stakeholders.[54] One association suggested that a better relationship with manufacturers may help agencies to reduce regulatory burden

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[50] EO 12866: "Each agency shall tailor its regulations to impose the least burden on society...", September 30, 1993.

[51] EO 13777 (March 1, 2017).

[52] Cass R. Sunstein, "Trump's Safe and Sane 'Regulatory Reform' Idea," *Bloomberg*, March 3, 2017.

[53] Jitinder Kohli, "What President Trump Can Learn From The UK About Reducing Regulations," Forbes, January 27, 2017.

[54] For example, note the following RFI responses: 48-RFF with regard to EPA and NAAQS; 133- PIA with regard to EPA and flexible air permitting; and 53- ACMA with regard to EPA emission modeling (see Docket ID "DOC-2017-0001," at www.regulations.gov).

without sacrificing their missions: "state regulators [in Indiana, Louisiana, Ohio, and Texas are] more knowledgeable about ... steel manufacturing, or more willing to take the time to become knowledgeable... Armed with superior knowledge, state personnel often understand the impracticability or inapplicability of certain controls or requirements, and are more often open to allowing alternate compliance options that reach the same goal through the use of less burdensome means." (112-SMA)

Examples from RFI responses of commonsense suggestions for reform (that might surface during a collaborative lookback) include the following (organized by category):

Lack of Knowledge about How Industry Operates

- "EPA's Risk Management Program rule and other regulations require manufacturers to interact with Local Emergency Planning Committees (LEPCs). [But] there are no LEPCs in many areas. Of the 100 counties in North Carolina, for example, only 40 have functioning LEPCs." (53-ACMA)

- [Regarding OSHA's Hazardous Air Contaminants Standards; for employers seeking to meet through an engineering calculation or evaluation they conduct] "Powered ventilation is generally the most effective and widely used technology to limit exposures to hazardous airborne substances in composites manufacturing workplaces. PPE [personal protective equipment] is also employed when the nature of the work limits the ability of employers to achieve safe exposure levels via ventilation alone. However, several industry employers have been cited by OSHA for using PPE when they have not "proven" that engineering control would not be sufficiently effective...." (53-ACMA)

- "FDA regulatory provisions implementing the Food Safety Modernization Act (FSMA) require sellers (farmers and food processors) to obtain from their customers (downstream food processors and distributors) certain "written assurances" [re food safety hazards] on an annual basis... An analysis by the Grocery Manufacturers Association determined that just the provisions in [one of several specific regulations] would require individual firms to obtain thousands or even millions of assurances every year...." (122-AHPA)

- [Regarding Non-Complying Lots -- 40 CFR. § 770.20(f), which requires fabricators that received notification from a producer of panels that failed an emissions test, to inform customers that their finished products contained these panels.] "First, by the time the fabricator receives the panel producer's notification, the panels almost certainly no longer exist as panels. Instead, the fabricator will almost certainly have cut up the affected panels it received into component parts, incorporated those component parts into finished goods, and shipped those finished goods. Second, the affected panels are untraceable once they are incorporated into finished goods. A fabricator does not track which panels go into which finished goods... Third, in the fabrication process the panels are covered with veneers or other coatings. This means that it is no longer feasible to test the panels accurately for compliance with the emissions limits. Fourth, the fabricator's notification is very likely to be completely unnecessary, because by the time the customer receives its

notification, the affected panels will probably have aged to the point that they now meet the emissions limits." (67-AHFA)

- [Regarding CWA §316(b)- Cooling Water Intake Structures (CWIS) -- Entrainment "Best Technology Available" (BTA) for facilities withdrawing less than 125 MGD] "Facilities withdrawing less than 125 MGD are not required to submit entrainment information however the permitting authority is still required to make a determination about the BTA to minimize entrainment... Permitting authorities generally lack the technical expertise in such areas, so it requires the permittees to provide the permitting authority with adequate technical information to support the BTA determination. A 52-week entrainment study can range from $140,000 to $410,000." (147-US Steel)

- "([Regarding] Toxic Substances Control Act (TSCA) regulation... Chemical Data Reporting (CDR) regulations require exceptionally detailed monitoring, recording, and reporting of the chemical make-up of our members' steel and steel coatings, raw materials...) It is overly burdensome to the steel industry to report on the general safety of a product that has been widely produced for several centuries and whose chemical makeup is well known and that poses little risk from exposure." (92-AISI)

- "EPA should ensure remediation cleanup standards are reasonably achievable... for example cleanup standards may be set below background concentrations that can never be achieved at a cleanup site until sources in the wider area are controlled...." (76-Boeing)

- "FDA has formally acknowledged under various circumstances that reliance on batch records is an accurate and practical method for assuring that finished food products meet required compositional specifications for ingredients that are chemically complex or for which no validated test method exists... [But] during inspections of firms under 21 CFR Part 111, FDA often pushes firms to implement expensive chemical testing for such ingredients (which would cost at least hundreds and potentially thousands of dollars per batch of product) — or to prove that no such chemical test method exists (an exercise that is expensive and pointless, since it's impossible to prove a negative and it is very rare for valid test methods to exist for chemically complex food ingredients, especially in a chemically complex matrix)." (122-AHPA)

Inconsistent Enforcement

- "Differential enforcement of a regulatory requirement across geographies (i.e., inspectors interpreting a regulation differently in two different manufacturing locations) is so troubling to compliance officials."[55]

[55] National Association of Manufacturers, "Holding US Back: Regulation of the U.S. Manufacturing Sector," prepared by Pareto Policy Solutions, LLC.

- "Inconsistent Federal implementation of the RCRA Corrective Action process from region to region and site to site... causes... increased cost and lost opportunities due to unpredictable or longer time periods for addressing impacts to the environment." (147-US Steel)

Antiquated Rules

- "The current Leak Detection and Repair (LDAR) rules require point-by-point monitoring for leaks (Method 21) for every LDAR component (valves, pumps, compressor seals, pressure relief devices, etc.). This is very time consuming and inefficient. Infrared cameras (IR camera) are now voluntarily used in manufacturing to detect leaks much more quickly and efficiently. The use of these IR cameras should be a technology option to replace the current antiquated LDAR rules." (89-IECA)

Technology Requirement is Too Expensive or Unproven (Unrealistic Assumptions or Cost is Too High)

- "FDA regulation 21 CFR 111, Current Good Manufacturing Practice (cGMP) in Manufacturing, Packaging, Labeling, or Holding Operations for Dietary Supplements, includes Section 111.605 (a) and (b) ... requires that all electronic records comply with 21 CFR 11, a burdensome and complex requirement to validate computer systems that was developed for drug manufacturers. The software and hardware validation requirements are costly, difficult to maintain, and fail to provide added security... Small and midsize dietary supplement manufacturers that lack the resources to validate computer systems are burdened with maintaining hard copies and using hand-written records, which is a costly, inefficient, and unnecessary clerical obligation...." (63-CRN)

- "The PSD BACT evaluation process, spelled out through EPA guidance, should not include unproven technologies employed in other countries that have not been demonstrated as commercially feasible or effective at controlling emission in the U.S. Requiring domestic facilities to conduct technology reviews and costly feasibility analyses of technologies utilized in countries that do not have the same rigorous air pollution control and permitting requirements, places unreasonable permitting demands and delays on the already lengthy U.S. permitting process." (92-AISI)

Complex, Onerous Processes, e.g., Unnecessary Recordkeeping

- "In past years we dedicated the majority of our environmental resources to emission reduction equipment that has dramatically reduced our impact on the environment. In more recent years, the majority of our environmental resources have been dedicated to monitoring and record keeping. Reducing the frequency of monitoring, and reducing the amount of recordkeeping and reporting would be very beneficial. We believe that we can adequately demonstrate ongoing and continuous compliance with reduced levels of monitoring and recordkeeping." (112-SMA)

- "For permitting projects... USEPA and States ask for endless pieces of information that are not necessary to issue a permit or approve a submittal; and are beyond what is required by statute and the implementing regulations. Frequently, the agencies indicate the information is needed to address questions or concerns from third parties—'we need this information because somebody may ask about it or because it would be nice to know.'" (147-US Steel)

- "Review and streamline data requirements to ensure that only data that is required for a permit decision is required to be submitted." (79-Northrup Grumman)

- "Record Keeping Mandate on EPA Air Permitted Standby Engines: 40 CFR Part 51 (Subpart A) ... Standby engines rarely operate but companies, by law, are required to report emissions data... in 2016, a company reported total emissions from emergency engines (generators and fire pumps) as follows. [Table shows emissions sum= 0.005716 tons per year) The company estimates that it takes $500 (5 times $100 per engine) per year to monitor, report, and do maintenance as EPA instructs them to do. Given the costs and given the emission volume, it cost about $90,000 per ton of emissions." (89-IECA)

Review of Existing Regulations

Reducing the existing regulatory burden is perceived by some respondents to be more critical than reforming the process of creating new regulations.[56] Retrospective reviews of existing regulations have been required since the Carter administration, but like reforms for rulemaking processes, retrospective reviews often do not receive appropriate emphasis.

The need for retrospective review is straightforward. Although public engagement is critical before rules are written, retrospective reviews give agencies and the regulated community an opportunity to assess a regulation's actual impact — costs and benefits — using real numbers and experiences. "Lookbacks" would allow agencies to examine unintended costs as well as identify (and ameliorate) unnecessarily burdensome compliance requirements.

There are many reasons why meaningful retrospective reviews are rare. The overriding reason is probably the same as for new rules (above): there are "insufficient incentives"[57] to overcome the strain on resources required to conduct these reviews. Some sources suggest that agencies are biased and that "External funds must be provided to give disinterested researchers an incentive to conduct unbiased and independent studies."[58]

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[56] National Association of Manufacturers, "Holding US Back: Regulation of the U.S. Manufacturing Sector," prepared by Pareto Policy Solutions, LLC and NERA Economic Consulting, "Macroeconomic Impacts of Federal Regulation of the Manufacturing Sector." Prepared for the Manufacturers Alliance for Productivity and Innovation (MAPI), August 21, 2012.

[57] Winston Harrington, "Grading Estimates of the Benefits and Costs of Federal Regulations: A Review of Reviews," Resources for the Future (RFF) Discussion Paper, September 2006.

[58] Ibid.

Several models were suggested such as creating another non-partisan entity like the Congressional Budget Office (CBO) which avoids making policy recommendations and focuses on unbiased analysis; and, in this case, the new entity would identify regulations that are in need of reform or elimination.[59] Regulatory Reform Task Forces (RRTFs) have been formed (via EO 13777) within each agency and they can help play this role if members are given sufficient autonomy and capacity to focus primarily on regulatory reform activities. Because of the limited resources historically made available for reviewing existing regulations, and the tendency for agencies to be biased in favor of their respective regulatory authorities, constant attention and oversight of their efforts will be required in order to make sufficient progress.

President Trump's Executive Order 13771 also provides the forum and structure for an ongoing retrospective review by requiring agencies to implement a "2 for 1" (also known as "one-in, two-out," or Cut-Go) mandate that requires the elimination of regulations or costs of existing regulations to offset the burdens of a new regulation. Countries such as the United Kingdom, Canada, the Netherlands, and Australia have implemented a version of this program.[60] In Senate testimony, Senator Mark Warner claimed that the United Kingdom went from being the epitome of regulatory oppression to surpassing the United States in international competitiveness in part because of its ongoing PAYGO-type policies.[61]

Reforming the Permitting Process

According to respondents, "permitting requirements are numerous and quite onerous." (112-SMA) Permitting — particularly related to the Clean Air Act and Clean Water Acts — was the most frequently cited concern, and often identified as a top priority regulatory burden. The Clean Air Act New Source Review (NSR) program was described by many as the most significant permitting challenge and impediment to construction of new manufacturing plants and modernization of existing facilities.

Beyond the reforms to specific regulations and permitting processes called for in this report, there are two overarching problems that must be addressed throughout federal permitting. The first is overlap, duplication and lack of coordination among agencies, permitting processes, and reporting requirements. The second is uncertainty in the permitting processes.

Overlap, Duplication and Coordination

Many RFI respondents raised concerns that EPA "second-guesses" state decisions. (170-APF) "Even in cases where a state issues CAA permits under an EPA-approved [state implementation plan], there are instances when decisions made by the permitting authority are re- evaluated and revisited by EPA, duplicating the efforts of the agencies and adding uncertainty for the permittee." (126-API)

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[59] Philip A. Wallach, "An Opportune Moment for Regulatory Reform", Brookings, April 2014.

[60] All 4 nations focus on cutting costs not number of regulations; Australia, Canada, and the Netherlands focus on red-tape or administrative costs; the United Kingdom's definition is broader but focuses heavily on red-tape.

[61] How Best to Advance the Public Interest: Hearing before the Committee on Homeland Security and Governmental Affairs, U.S. Senate, 112th Congress, (2011)

In addition, there were examples cited of "overlapping jurisdiction of federal agencies and programs" (146-NAM) such as:

- "Aspects of RCRA and CAA permits" (158-CKRC)
- "NSR and Title V permits can have significant overlap..." (109-Valero)
- "EPA and the U.S. Army Corps of Engineers: Water and wetlands." (146-NAM)
- "EPA's Integrated Risk Information System, EPA's risk evaluation programs under the Toxic Substances Control Act, the CDC's Agency for Toxic Substances and Disease Registry Toxicological Profiles program, and NIH's National Toxicology Program Office of Report on Carcinogens have largely redundant missions." (53-ACMA)

In some cases, multiple regulations or agencies require the same information: "Companies are often required to separately report the same information to multiple regulatory offices and programs, including at the federal, state and local level. For example, data on air emissions are typically reported as part of permit compliance reports, to state air emission inventories, and to EPA's Toxic Release Inventory program." (152-AWC)

A related issue is the lack of coordination of the review process when more than one agency is involved: "US Army Corps of Engineers has authority for Section 404 permitting. However, in order to get the permit, review and consultation is required for multiple other federal agencies... all raising issues about maintaining sufficient bird and fish habitat." (126-API)

Overlap, Duplication and Coordination — Potential Solutions. Many respondents suggested that federal agencies (primarily EPA) should defer to states in order to: "...reduce, if not eliminate, federal second-guessing. Substitute individual permit oversight with federal programmatic overview of state adherence to permitting requirements. States should be evaluated on how their program is performing, not micromanaged on each and every permit decision." (170-APF)

In other cases, where multiple agencies must be involved, many respondents suggested something similar to FAST-41 type provisions:

- "Designate Lead Agency to coordinate responsibilities among multiple agencies involved in project reviews."
- "Provide for concurrent reviews by agencies, rather than sequential reviews."[62] (107-COC)

[62] The Water Resources Reform and Development Act of 2014 is another FAST-41 type model for permitting reform according to 109-Valero: "...overhauled the Corps' planning process by creating a strict three-year deadline and $3 million federal cost limit for feasibility studies. It required different levels of Corps review to occur concurrently and eliminated duplicative requirements, such as multiple cost-estimates and a reconnaissance study. [Also] designated the Corps to be the lead agency coordinating reviews for civil works projects...."

Respondents also offered the following best practice examples:

- "Ohio EPA piloted a program in which it took normally sequential steps in permit processing and executed them in parallel, significantly reducing overall permit processing time." (170-APF)
- "Indiana Department of Environmental Management's air program processes construction permit applications and associated Title V permit modification for projects concurrently...." (147-US Steel)
- "The California Unified Program Agency (CUPA) consolidates hazardous waste and hazardous materials requirements of multiple programs into a single regulatory entity. The result is simplified permitting, reduced regulatory complexities and reduced management burden." (79-Northrup Grumman)

One association suggested a "reporting portal" to be created by EPA with state and local regulators to "allow manufacturers to report information needed by regulatory programs only once." (152-AWC)

Several RFI respondents suggested that a specific coordinator is needed, such as a federal office responsible for permit coordination (106-AFS), or an EPA ombudsman: "This supervisory body could [provide] the regulated community with a means for coordination across various environmental media (water, air, etc.) and across various agencies (e.g., EPA, Army Corps of Engineers, Fish & Wildlife), perhaps even including state and local agencies or authorities." (76-Boeing)

Uncertainty Related to Permit Processes

Permitting challenges are exacerbated by uncertainty, as addressed in many of the RFI respondents complaints. Uncertainty comes from inter-related issues driven by complexity such as "case-by-case" or "one-off" reviews, which often "reinvent the wheel." There is also a general lack of consistency, which then contributes to uncertain timelines, which itself is exacerbated by the threat of delay driven by public protest/litigation. This complex situation is then made more uncertain by lack of transparency/poor communication. While uncertainty is also a problem in non-permitting regulations (discussed above), it appears to be a significant and systemic problem in environment-related permitting: "Environmental permitting has many sources of uncertainty, including ... timing, procedures, the roles of various agencies in multi-agency review projects, and the data that the permitting authorities use and rely upon in making permitting decisions. Often, this variability is based on the views and expectations of a particular regional office or specific employee or office within EPA. Other times, the requirements can apply Agency-wide yet still create uncertainty. EPA, for example, is inconsistent in its data demands and the procedures by which it approves projects...." (112-SMA)

Environmental permitting is so complex that respondents described having to hire several consultants and lawyers to help "navigate" the "elaborate mazes" that permit regulations have become. (170-APF) Moreover, this appears to be true of "even simple modifications" to regulations. (112-SMA) One association wrote, "Obtaining a permit for just one CAA program alone (the NSR program) can require the permittee to

review nearly 700 posted guidance documents...." (170-APF) For manufacturing firms, the uncertainty of the permitting duration, which can take years, may be the greatest challenge. "The lack of certainty as to when the permit will be issued... create(s) significant burden, compliance difficulty, and business uncertainty...." (126-API) Permitting delays are partly driven by complexity and lack of coordination as discussed above. But some respondents blamed agency staff for contributing to the problem, claiming staff can "sit on an application until their allotted time is almost up before looking at it regardless of how minor or simple the task." (114-AGC) On the other hand, other respondents claimed that delays are sometimes due to insufficient staffing resources at permitting agencies. (79-Northrup Grumman; 126-API; 123-3M)

Delays are not only driven by the agency or agencies. Lawsuits or "not-in-my-backyard activism" (107-COC) are a significant permitting issue: "Even where a permit remains valid pending resolution of the litigation, significant uncertainty can be introduced into the process of building or expanding a facility and it can take years to resolve all issues." (136-AFPM) While this is not under the control of regulatory agencies, it does increase the uncertainty for manufacturers in making investment decisions.

Lastly, according to respondents, EPA's lack of straightforward communication adds to manufacturers' burden: "EPA does not provide clarity on its procedures and information requirements. These transparency problems are significantly compounded when EPA changes its requirements through Agency-generated guidance without notice to the applicants or the ability to comment on, or ask questions about, the guidance." (112-SMA) As one example, an association explained that a Congressional requirement that EPA publish all state implementation plans (SIPs) was put in place "because it was virtually impossible to determine which regulations were currently approved as part of the SIP. This lack of transparency serves to delay projects simply because discerning what regulations apply presents its own challenge."[63]

Uncertainty — Potential Solutions. FAST-41 is often praised as a step in the right direction for permitting reform. Established under Title 41 of the Fixing America's Surface Transportation (FAST) Act (42 U.S.C. § 4370m), FAST-41 was designed to improve the timeliness, predictability, and transparency of the federal environmental review and authorization process for "covered" infrastructure projects.[64]

FAST-41 created a new Federal Permitting Improvement Steering Council (FPISC), with representation from Deputy Secretary-level members and led by a presidentially-appointed Executive Director. It also created agency Chief Environmental Review and Permitting Officers (CERPOs). Covered projects voluntarily gain access to improved authorization and environmental review processes such as early consultation, coordinated projects plans, project timetables, public Dashboard tracking,[65] and dispute resolution procedures.

[63] CAA Section 110(h)(1), requires *"EPA to assemble and publish all"* SIPs; but EPA is not complying. (170-APF).

[64] For more information, see https://www.permits.performance.gov/about/fast-41.
[65] For more information, see https://www.permits.performance.gov/projects.

Covered projects are defined as any activity in the United States that requires authorization or environmental review by a federal agency involving:

- Construction of infrastructure in a designated sector
- That is subject to NEPA, and
    - Does not qualify for an abbreviated review process and is likely to cost more than $200M; or
    - Is of a size/complexity likely to benefit from enhanced oversight/coordination in the opinion of the Council, including:
        - Projects likely to require an Environmental Impact Statement
        - Projects likely to require reviews from more than two federal agencies.

Infrastructure includes (with some exemptions): manufacturing projects as well as renewable energy production, conventional energy productions, electricity transmission, surface transportation, aviation, ports and waterways, water resource projects, broadband, pipelines, aviation, and any other sector determined by a majority vote of the FPISC.

The initiative is new, with the inventory of existing covered projects just added to the Dashboard in September 2016. For that reason, one commenter recommended "revisit[ing] lessons learned from FAST 41 (sic) permit streamlining later when the FAST 41 program is more mature." (128-Pugh) At the same time, the U.S. Chamber of Commerce directly asked that "the administration's permit streamlining efforts are consistent with FAST-41 activities already being administered by the Office of Management and Budget." (107-COC). NAM noted the potential value of implementing in concert Executive Order 13766, "Expediting Environmental Reviews and Approvals for High Priority Infrastructure Projects," and FAST-41. (146-NAM)

Although manufacturing is a covered sector under FAST-41, given the short history of FAST-41 and the strict definition of covered projects, the manufacturing community has yet to share in its benefits. Several of FAST-41's key provisions (107-COC) would be extremely beneficial if they were to be applied to manufacturing industry permitting:

- "Establish a permitting timetable, including intermediate and final completion dates";
- "Require that agencies involve themselves in the [permitting review] process early and comment early, avoiding eleventh-hour objections that can restart the entire review timetable"; and
- "Reduce the statute of limitations to challenge a project review from six years to two years."

RFI respondents echoed these types of recommendations. Florida offers a best practice model, illustrating that an efficient permitting process is possible: "The SNAP (Simplified Nimble Accelerated Permitting) process, used by state and municipal agencies in central Florida engages in streamlined, efficient and rapid construction permitting... transform[ing] an onerous and time consuming process into a reasonably straightforward and user friendly permit acquisition process." (79-Northrup Grumman).

A frequently discussed provision of FAST-41 — the "searchable, online 'dashboard' to track the status of projects during the environmental review and permitting process" (107-COC) — addresses transparency. In addition, a respondent cited a similar best practice in this area by a federal agency: "The FCC has most of its experimental license application process available on-line. It is easy to see that an application is in the system, and any comments or requests are also visible. The history of most experimental licenses is available, going back several years." (79-Northrup Grumman)

To address over-complexity respondents suggested various types of permitting standardization as well as best practice examples:

- "Replace uncertain case-by-case permit review programs with standardized regulatory decisions that are periodically updated through rulemaking after public notice and comment." (112-SMA)
- "Develop pre-approved specifications for permits to simplify and shorten the permit process." (79-Northup Grumman)
- Offer "general permits that companies can opt into for standard pieces of equipment...." (170-APF)
- "U.S. EPA should promote and directly facilitate issuance of innovative air quality permits by state/regional permitting authorities, especially permits that "advance- approve" changes at manufacturing facilities." (123-3M)
- Streamlined permitting for "minor" projects are offered by the Pennsylvania Department of Environmental Protection (online self-registration forms using templates) and the State of Texas (permit-by-rule program). (158-CKRC)

In addition, one respondent suggested that "Federal agencies should implement Lean [Six Sigma] practices to streamline permitting" and noted that EPA regional offices are attempting to do this. The respondent goes on to say Lean practices can help agencies reduce uncertainty and inefficiency and shorten schedules and points to the Arizona Department of Environmental Quality as having had success with Lean efforts. (76-Boeing)

In addition to reducing the time limit for challenging a permit from 6 years to 2 years as described above, there were a few other recommendations as to how to improve the processes by which permitting decisions and projects can be opposed. One association related a case where a firm settled a lawsuit brought by an environmental group even though the regulatory agency had found that the facility had done nothing wrong. The association suggested: "The applicable provisions of the major environmental statutes must be revised

to introduce reasonable but tough thresholds to control the right of third parties to unreasonably intervene resulting in delays and expenses to industry. The thresholds must be based on local agency negligence, fraudulent/unlawful behavior or inappropriate influence." (89-IECA)

Also, because of the potential of a lengthy permitting process, lack of "grandfather" protection can be exploited by objectors and is a recommended reform: "Without [grandfather] protection, project opponents will have an incentive to delay the permitting process as long as possible in the hope that the area will be designated NA [nonattainment] before a final permit can be issued. A more consistent grandfathering approach would ensure that companies do not spend years trying to obtain a PSD permit, only to reach the end of the process and find they now need to get an NA NSR permit (with offsets that may not be available) rather than a PSD permit." (48-AF)

New Rules: Improving the Rulemaking Process

The Office of Information and Regulatory Affairs (OIRA) review of agency rules should be reaffirmed in a number of ways.

- Cost benefit analysis methods should be refined, and made more rigorous and enforced by OIRA, with a view toward continual improvement, including development of new methods and more thorough evidence bases.
- Cumulative costs should be rigorously weighed where appropriate.
- Regulations should not impede innovation.
- There should be meaningful public engagement prior to issuing significant proposed rules.
- Regulations should be more sensitive to the impact on small business.
- Regulations should only be enacted and enforced when there are adequate resources available for review, implementation and oversight.

Recommendations and Priority Areas for Reform

Through submitted comments, industry expressed clear support for the need to protect the environment, human health, and worker safety, but shared concrete, detailed concerns with how the federal government has set out to achieve those objectives through regulation, guidance documents, and other means. They identified numerous regulatory and permitting problems that include:

- Onerous and lengthy permitting processes that increase cost, add uncertainty, and inhibit investment in and expansion of manufacturing facilities;
- Inadequately designed rules that are impractical, unrealistic, inflexible, ambiguous or lack understanding of how industry operates;
- Unnecessary aspects of rules, or unnecessary stringency, that are not required to achieve environmental or other regulatory objectives;
- Overlap and duplication between permitting processes and agencies; and
- Overly strict or punitive interpretations of guidance, policies or regulations that are often counter to a pro-growth interpretation.

The Department identified twenty sets of regulations and permitting reform issues from the respondents as being a top priority for immediate consideration. Consistent with previous studies on the costs of federal regulations, comments on Environmental Protection Agency (EPA) rules dominated the responses from industry, and constitute the bulk of the Department's recommended Priority Areas for Reform.

Priority Areas for Reform
Clean Air Act

1. New Source Review (NSR) or Prevention of Significant Deterioration (PSD) permits:

    a. Enforce the one-year turnaround time on NSR/PSD permit applications.[66]

    b. Reduce statute of limitations on challenges or appeals to one year.[67]

    c. Allow non-emitting construction activities to commence prior to receiving a permit.[68]

    d. Consider options to revise the definition of Routine Maintenance, Repair & Replacement (RMRR) to provide more flexibility.[69]

    e. Promote and facilitate use of flexible permitting mechanisms associated with PSD and Title V including, but not limited to, plant-wide applicability limits (PALs) and alternative operating scenarios. As part of this, consider any regulatory or other changes (e.g., guidance) that could facilitate more widespread use of these flexible permitting tools.[70]

    f. Develop opportunities to streamline NSR applicability determinations and/or to reduce the number of facilities and projects that may be subject to NSR through evaluating and pursuing regulatory and guidance options for addressing aggregation, project netting, debottlenecking, and the methodology by which pre and post construction emissions are calculated.[71]

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[66] EPA will coordinate with state and local air agencies, as well as EPA regional offices, to develop best practices, guidance, or regulatory revisions necessary to ensure that NSR permits are issued consistent with the 12-month timeline described in the CAA.

[67] EPA is pursuing regulatory action intended to streamline the Title V process. Congressional action would be required to reduce statute of limitations.

[68] EPA would need to review existing regulations and guidance and identify situations for which it would be appropriate to provide additional clarity and/or opportunities to begin construction without an NSR/PSD permit.

[69] Legislation would be required for a change to the statutory definition. Respondents recommended considering potential regulatory actions to provide clarification and flexibility.

[70] EPA could conduct outreach to educate sources and permitting agencies on the benefits of flexible permitting tools and also consider minor changes to PAL provisions to provide more incentives for sources to use PALs. The EPA intends to highlight and encourage use of flexible air permitting options.

[71] EPA should review existing regulations and guidance to identify opportunities to address these issues and provide more flexibility through regulatory actions. Litigation is pending over EPA's 2009 aggregation and project netting rule; this litigation is pending resolution of EPA's reconsideration process.

g. Issue guidance on modeling concurrent with promulgation of revised National Ambient Air Quality Standards (NAAQS), to ensure timely clarification on modeling required as part of a NSR application.[72]

h. Consider opportunities to "grandfather" NSR applications following revision of a NAAQS.[73]

i. Consider opportunities to emphasize key aspects of the Best Available Control Technology (BACT) analysis including, but not limited to, expectations regarding technology determinations.[74]

j. Consider opportunities to expand the purchasing offsets outside of the local areas as well as other offset related revisions which would provide increased flexibility and burden reduction.

2. Title V Operating Permits (incorporates all of the federal and state air pollution control requirements): Extend the term of the permit from 5 to 10 years.[75]

3. National Emissions Standards for Hazardous Air Pollutants (NESHAP):

   a. EPA should increase efforts to reduce costs and avoid duplicative requirements in conducting reviews of NESHAP standards.

   b. EPA should take steps to ensure that any new requirements considered under Residual Risk and Technology Reviews (RTRs) would not be redundant or unreasonably costly.[76]

4. Consider options to provide relief for facilities through affirmative defenses or other avenues to account for unforeseeable and uncontrollable emissions during periods of startup, shutdown, and malfunction (SSM). The EPA previously adopted an interpretation which exempted SSM periods from the emissions restrictions that apply under normal operating periods.[77]

5. National Ambient Air Quality Standards (NAAQS):

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[72] EPA has committed to timely issuance of guidance.

[73] Existing regulations provide some opportunities for "grandfathering" NSR applications.

[74] EPA would need to evaluate what could be provided to streamline BACT determinations.

[75] The EPA is completing the petitions rulemaking that will revise part 70 to clarify and streamline the process by which EPA receives and reviews Title V petitions, thereby increasing transparency and efficiency for regulated entities and environmental agencies. This action will address how EPA intends to review Title V petitions in an effort to reduce opportunities to raise NSR issues in the context of Title V.

[76] Under its existing authorities EPA is taking action to harmonize NESHAP and NSPS obligations.

[77] Pending litigation in Walter Coke, Inc., et al. v. EPA, No. 15-1166 (D.C. Cir.) (challenge to SSM SIP) and in American Municipal Power v. EPA (Sup. Ct.). Whether such exemptions and affirmative defenses can be allowed under the CAA is central to the litigation.

a. EPA should develop options that consider "real-world measurements" instead of "probabilistic models" for the PSD program.[78]

b. Extend NAAQS reviews from 5 to 10 years.[79]

c. Ozone: Delay implementation of the 70 parts per billion (ppb) standard or retain the earlier 75 ppb standard. Observers stated the 70 ppb level is approaching "background" levels of ozone in certain areas.[80] The pace at which the standard is being tightened seems hurried; implementation is further complicated by measurement and air quality modeling issues, in particular accounting for ozone transported from international sources.

6. Consistent with its authorities under section 111 of the CAA, EPA should consider adding exemptions for research and development (R&D) related activities or otherwise streamline requirements for R&D activities for New Source Performance Standards.[81]

7. EPA should issue a Unified Coating Rule (UCR) that facilities could choose to meet (replacing the eight overlapping NSPS and NESHAP regulations that apply to coatings).[82]

Clean Water Act

8. Waters of the United States Rule: Reconsider the rule to define more narrowly "waters of the US" to exclude ephemeral tributaries. EPA and the U.S. Army Corps of Engineers (USACE) are reviewing the existing Clean Water Rule and its definitions of "navigable waters" as directed by Executive Order 13778. // On July 27, 2017, the EPA and the USACE published a proposed rulemaking to repeal the 2015 Clean Water Rule and reinstate the regulations in place prior to its issuance.[83] As indicated in the proposed withdrawal, the agencies are implementing EO 13778 in two steps to provide as much certainty as possible as quickly as possible to the regulated community and the public during the development of the ultimate replacement rule. In Step 1, the agencies are taking action to maintain the legal status quo of the rule in the Code of Federal

[78] The EPA is concerned that this approach would result in a directive that would impose greater costs on regulated facilities. This issue is similar to many raised in the NSR/PSD suggestion.

[79] Altering the NAAQS timeframe would require congressional action. EPA should consider opportunities to ensure that any forthcoming reviews are not redundant and are completed expeditiously.

[80] On-going litigation: Murray Energy Corporation et al. v. EPA, No. 15-1385 (and consolidated cases), (D.C. Cir.) (challenge to the 2015 ozone NAAQS).

[81] See 40 CFR sections 60.40(c) and (d); 60.292(d); and 60.332(h). EPA is evaluating its authority to exempt R&D related activities under section 111. The EPA has routinely considered adding exemptions for R&D related activities and has added specific R&D exemptions in the past.

[82] There is ongoing litigation regarding several NESHAP. EPA cannot provide specifics. EPA has court ordered deadlines to complete risk and technology reviews for several NESHAP that apply to certain coatings. EPA should consider options with an UCR to provide flexibility that encourages facilities to meet the rule by using pollution prevention approaches.

[83] 82 FR 34899 (July 27, 2017)

Regulations, by recodifying the regulation that was in place prior to issuance of the 2015 Clean Water Rule. Currently, Step 1 is being implemented under the U.S. Court of Appeals for the Sixth Circuit's stay of the rule. In Step 2, the agencies plan to propose a new definition that would replace the approach in the 2015 Clean Water rule with one that reflects the principles in EO 13778.

9. Section 404[84] and National Pollutant Discharge Elimination System (NPDES) permits: Provide permit applicants with clear descriptions of required steps and additional tools to assist them in completing the permitting process.[85]

Other

10. Resource Conservation and Recovery Act (RCRA): Inappropriate classifications of waste streams as "hazardous" prevent or discourage recycling, reuse or reclamation. Aggressively review lists of hazardous waste to consider delisting certain compounds/materials/liquids that could easily be reused or recycled, but for this classification.[86]

11. Revise the Crystalline Silica Standard. A 2016 Department of Labor (DOL) Occupational Safety and Health Administration (OSHA) rule was finalized which cut in half the permissible exposure to crystalline silica (for general industry and maritime) from 100 to 50 micrograms per cubic meter. Recommendation is to keep allowed level at 100 micrograms per cubic meter.[87] // DOL announced on April 6, 2017 that it would delay enforcement of the respirable crystalline silica standard for construction until September 23, 2017, to conduct additional outreach and provide educational materials and guidance for employers.

12. Revise the OSHA rule to Improve Tracking of Workplace Injuries and Illnesses by removing requirement to disclose records of workplace injuries and illnesses and to alleviate the duplicative nature of work-related injury information collection. Clarify in guidance that this rule should not undermine safety incentives and drug testing programs.[88] // DOL has proposed delaying until December 1, 2017 the initial reporting of data on workplace injuries and illnesses (Form 300A) in order to give the administration an opportunity to review the new electronic reporting requirements. The proposed five-month delay would be effective on the date of publication of a final rule in the

[84] Section 404 Permits are under the purview of the US Army Corps of Engineers.

[85] EPA and USACE should explore opportunities to truncate the permitting processes and elevate any barriers, such as needed regulatory changes, to senior leadership for consideration.

[86] In 2015 EPA published a comprehensive revision to its rules governing the recycling, reuse and reclamation of hazardous secondary materials, where these materials would otherwise become listed or characteristic hazardous wastes if discarded rather than recycled.

[87] Pending litigation. Could be modified or repealed by agency notice-and-comment rulemaking, but must remain consistent with underlying statutory provisions in the Occupational and Safety and Health Act, 29 U.S.C. § 655(b)(5).

[88] Could be modified through further notice-and-comment rulemaking (underlying statutory requirement that companies maintain certain injury records). This issue is pending litigation.

Federal Register. Furthermore, DOL has announced its intention to issue a proposal to reconsider, revise, or remove other provisions of the Improve Tracking of Workplace Injuries and Illnesses final rule, 81 FR 29624 (May 12, 2016).

13. Revise Section 1502 of Dodd-Frank Act. Remove the Securities and Exchange Commission (SEC) requirement on manufacturers to "undertake 'due diligence' on the source and chain of custody of its conflict minerals and file a Conflict Minerals Report" and to disclose publicly this information.[89] // On April 28, 2017, the SEC suspended enforcement of the rule until ongoing litigation [Nat'l Ass'n of Mfgrs v. SEC, No. 13-5252 (D.C. Cir. Apr. 14, 2014)] has concluded.

14. Rescind Section 953(b) of Dodd Frank Act which requires CEO pay ratio disclosure.[90] // On February 6, 2017, the SEC opened a 45-day comment period on unexpected challenges for compliance with the rule. Acting Chairman Michael Piwowar directed staff to reconsider the implementation of the rule based on any comments submitted and to determine as promptly as possible whether additional guidance or relief may be appropriate.

15. Do not implement Equal Employment Opportunity Commission's (EEOC) expanded requirements for hours and earnings data on EEO-1 forms. // On August 29, 2017, OMB issued a memo to the EEOC announcing a review and immediate stay of the effectiveness of those aspect of the EEO-1 form that were revised on September 29, 2016.[91]

16. Delay compliance dates for the Intentional Adulteration rule required by the Food Safety Modernization Act (FSMA). The Department of Health and Human Services, Food and Drug Administration (HHS, FDA) should rescind requirements to obtain written assurances from downstream customers on an annual basis, or alternatively consider revision of requirement to reduce frequency and burden.[92]

17. Extend compliance deadline on nutrition labeling standards from 2018/2019 to 2021. This will allow further time for the FDA to further clarify rules[93] and definitions regarding "dietary fiber" and "added sugar" required by the new label format. // On June 13, 2017, the FDA announced that the

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[89] This would require a statutory change.

[90] This would require a statutory change.

[91] See https://www.reginfo.gov/public/jsp/Utilities/Review_and_Stay_Memo_for_EEOC.pdf.

[92] The current compliance dates are 3,4 or 5 years after the date of publication of the rule (May 27, 2016), depending on the size of the business. Administrative action would be required to effect a delay in the compliance dates for the Intentional Adulteration rule. Although FSMA required that FDA promulgate a final rule to protect food against intentional adulteration within 18 months of enactment of FSMA, the statute does not appear to specify compliance dates. Delaying compliance would require publishing a final rule; rescinding or revising the written assurance provisions would require rulemaking.

[93] The rule was promulgated pursuant to section 403(q) of the Federal Food, Drug, and Cosmetic Act, which requires certain nutrients to be included in nutrition labeling and authorizes the Health and Human Services Secretary to require other nutrients to be included if the Secretary determines that the information will assist consumers in maintaining healthy dietary practices.

compliance dates for the Nutrition Facts Label Final Rules will be extended. The FDA has not specified the length of the extension, but will announce new compliance dates in a future Federal Register Notices. FDA explained that additional time would provide manufacturers covered by the rule with necessary guidance from FDA, and would help them be able to complete and print updated nutrition facts panels for their products before they are expected to be in compliance.

Recommendations

The Department makes three broad recommendations.

Agency "Action Plans." Each agency's Regulatory Reform Taskforce (RRTF) should deliver to the President no later than December 31, 2017, an "Action Plan" to address the regulatory burden and permitting reform issues highlighted in the responses to the RFI. The relevant agencies should review all comments received in response to the Department's RFI, and particularly address the issues detailed in the section on "Priority Areas for Reform." RRTFs should prioritize a response to these particular items and should include in their action plan a description of specific actions that could be taken to lessen the burden created by the regulations mentioned in the RFI comments. In the first year, agency leadership should update the President regularly on the status of their efforts regarding these tasks. While the "Priority Areas for Reform" list is by no means comprehensive, it represents a targeted first step to quickly address the problem of over regulation.

Annual Regulatory Reduction Forum. The Department recommends creating an annual, open forum for regulators and industry stakeholders to evaluate progress in reducing regulatory burdens. There is a long-standing need for consultations with industry to identify specific actions the federal government can take to reduce unduly burdensome regulations and accelerate permitting decisions. Industry has repeatedly expressed its appreciation of the Trump Administration's regulatory reform effort and the trust it has in the Department of Commerce to listen and bring the voice of business to this effort. Because of this, the Department of Commerce recommends that it, along with other regulatory agencies, continually evaluate progress and re-attack the problem areas. Similar to Kentucky's "Red Tape Reduction Initiative," federal agencies should collect, review, and act on recommendations from industry. Input from these annual "check-ins" will guide the continuing burden reduction efforts of RRTFs and ensure regulators are moving in the right direction while allowing for policy changes as needed.

Expand the Model Process of FAST-41. The Department recommends further implementation of the streamlined permitting process created by "FAST-41."[94] The FAST Act contains various provisions aimed at streamlining the environmental review process, with improved agency coordination through creation of a Coordinated Project Plan and a Permitting Dashboard which serves as a centralized information page for pending projects, as well as opportunities to better coordinate with state environmental documentation.

[94] Title 41 of the Fixing America's Surface Transportation Act of 2015 ("Fast-41", codified at 42 U.S.C. § 4370m) streamlines the Federal environmental review and permitting for certain infrastructure projects. FAST-41 created an interagency Federal Permitting Improvement Steering Council (FPISC); established new procedures for interagency consultation and coordination practices; authorized agencies to collect fees to help speed the review and permitting process; and uses the Department of Transportation's "Permitting Dashboard" to track all covered projects.

The Federal Permitting Improvement Steering Council should consider including projects in an "economically significant" category. Those projects resulting in significant, immediate economic benefit to the United States should be considered for inclusion under this new category. Consideration should be extended to complex funded manufacturing projects that can demonstrate direct and indirect benefits to the domestic economy of significant value. To be eligible for the current streamlining process, projects in this sector or category would still need to meet the definition of covered project under FAST-41.

FAST-41 provides a model process that could be incorporated into other Federal legislation that governs Federal programs and requirements that apply to manufacturing facilities. To expand further the universe of manufacturing projects that benefit from streamlined regulatory approval processes, the Administration could work with members of Congress to both expand the definition of "covered project" under FAST-41 and to incorporate procedures similar to those found in FAST-41 in other legislation applicable to manufacturing projects. Expansion of the definition of covered projects to include those which result in immediate economic benefit to the United States would help to further goals of expanding the domestic economy and lessening permitting burdens for manufacturers seeking domestic expansion of their operations.

Conclusion

The domestic manufacturing sector and our broader economy are in desperate need of regulatory reforms in order to jump- start economic growth and create jobs, innovation and prosperity for all Americans. During the process of gathering information related to this report it has become apparent that we must make significant progress in improving the way government regulates the manufacturing sector. While environmental protections are of critical importance, many regulations are being enforced in a way that is limiting the growth of our economy and our global economic leadership, while in some cases regulations are providing no meaningful environmental or public health benefits. We believe prudent actions are advisable in order to return balance to regulatory procedures.

The Department believes that the recommendations contained in this report will provide a foundational base from which government can begin to approach this monumental task. These recommendations are consistent with all ongoing regulatory reform efforts, including those outlined in Executive Orders 13777[95] and 13766.[96] Working through their RRTFs, agencies must continue to shape more focused strategies for re-forming rules, guidance and policy to address the numerous challenges cited throughout this report. We hope that through highlighting these challenges it will become easier for regulatory agencies to clearly see contentious areas and work with the regulated community to resolve them in ways that unlock our economy's potential and advance the goal of job creation. Agencies must be willing to work with those subject to their rules, guidance and policy to find methods to implement existing statutes in ways that are less cumbersome and restrictive.

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[95] EO 13777 (March 1, 2017).

[96] EO 13766 (January 24, 2017).

The Department looks forward to partnering with other federal agencies to continue this endeavor in the future. We are optimistic that with continued emphasis the federal government can make progress towards these goals.

Appendix

Abbreviations Used in References to RFI Responses		
RFI #	**Abbreviation**	**Respondent**
6	NFIB	Nat'l Federation of Independent Business
10	PCBI	Pennsylvania Chamber of Business and Industry
14	Chromaflo	Chromaflo Technologies
37	ILMA	Independent Lubricant Manufacturers Association
39	IPC	Association Connecting Electronics Industries
42	Novelis	Novelis
43	Mosaic	Mosaic Fertilizer
46	ATT	AT&T Services
48	AF	NSR Program paper: Art Frass, John Graham, Jeff Holmstead
51	NSSGA	National Stone, Sand and Gravel Association
53	ACMA	American Composites Manufacturers Association
56	CPA	Composite Panel Association
63	CRN	Council for Responsible Nutrition
64	TFI	The Fertilizer Institute
66	ARTBA	American Road and Transportation Builders Association
67	AHFA	Am. Home Furnishings Alliance, Kitchen Cabinet Intl. Assoc., Intl Wood Prods Assocs., Rec. Vehicle Ind. Assoc., Natl Retail Federation, Retail Industry Leaders Assoc.
69	Domtar	Domtar - Nekoosa Mill
70	GMA	Grocery Manufacturers Association
71	Whirlpool	Whirlpool
74	Knouse	Knouse Foods Cooperative Inc.
75	SLMA	Southeastern Lumber Manufacturers Association
76	Boeing	Boeing
77	CIRT	Construction Industry Roundtable
79	Northrup Grumman	Northrop Grumman Corporation
83	TM	Twin Metals

RFI #	Abbreviation	Respondent
84	Ameren	Ameren Corp
85	NOPA	National Oilseed Processors Association
86	IPAA	Independent Petroleum Association of America
89	IECA	Industrial Energy Consumers of America
92	AISI	American Iron and Steel Institute
96	NMA	National Mining Association
98	IDFA	International Dairy Foods Association
100	ACA	American Coatings Association
101	AA	Aluminum Association
102	Renfro	Renfro
106	AFS	American Foundry Society
107	COC	US Chamber of Commerce
109	Valero	Valero Companies
110	Freeport	Freeport-McMoRan
111	GAC	Graphic Arts Coalition
112	SMA	Steel Manufacturers Association; Specialty Steel Industry of North America
114	AGC	Associated General Contractors of America
115	HSIA	Halogenated Solvents Industry Alliance
116	HAFO	National Alliance of Forest Owners
119	AGC	Associated General Contractors of America
120	NTMA/PMA	National Tooling and Machining Association; Precision Metalforming Association
122	AHPA	American Herbal Products Association
123	3M	3M
125	BP	BP America
126	API	American Petroleum Institute
127	PCA	Portland Cement Association
128	Pugh	Theresa Pugh Consulting

RFI #	Abbreviation	Respondent
131	NMMA	National Marine Manufacturers Association
133	PIA	Plastics Industry Association
136	AFPM	American Fuel & Petrochemical Manufacturers
137	MEMA	Motor & Equipment Manufacturers Association
141	ACC	American Chemistry Council - Chemical Products and Technology Division
144	AFPA	American Forest & Paper Association
146	NAM	National Association of Manufacturers
147	US Steel	United States Steel Corporation
148	TSGTA	Tri-State Generation and Transmission Association
151	PESA	Petroleum Equipment and Services Association
152	AWC	American Wood Council
155	PMPA	Precision Machined Products Association
158	CKRC	Cement Kiln Recycling Coalition
159	VI	The Vinyl Institute
160	TCC	Troy Chemical Corporation
170	APF	Air Permitting Forum
172	VI	The Vinyl Institute

Note: The number associated with the respondents are the RFI ID# and can be used to access the responses, see Docket ID "DOC-2017-0001" at www.regulations.gov.

A complete list of respondents can be found at: https://www.commerce.gov/reducingburden

U.S. Environmental Protection Agency

Final Report on Review of Agency Actions that Potentially Burden the Safe, Efficient Development of Domestic Energy Resources Under Executive Order 13783

October 25, 2017

Environmental Protection Agency
Final Report on Review of Agency Actions that Potentially Burden the Safe, Efficient Development of Domestic Energy Resources Under Executive Order 13783

Executive Summary

On March 28, 2017, President Trump signed Executive Order 13783, Promoting Energy Independence and Economic Growth. The Executive Order establishes a national policy to promote the clean and safe development of domestic energy resources while avoiding unnecessary regulatory burdens. It directs federal agencies to "review all existing regulations, orders, guidance documents, policies, and any other similar agency actions (collectively, "agency actions") that potentially burden the development or use of domestically produced energy resources[.]"[1] The Executive Order also orders the U.S. Environmental Protection Agency (EPA) to review specific rules. As part of E.O. 13783, agencies are to develop a report detailing this review that includes recommendations for reducing unnecessary regulatory burdens.

Through implementation of environmental statutes such as the Clean Air Act and Clean Water Act, EPA promulgates regulations that may affect domestic energy use and resources. Under Administrator E. Scott Pruitt's leadership, EPA is working to fulfill its critical mission while ensuring regulations are consistent with underlying laws and policies. Implementation of E.O. 13783 and other presidential directives related to regulatory reform plays an important role in this effort.

In order to identify priority areas and specific regulations for potential repeal, replacement, or modification pursuant to E.O. 13783, EPA has coordinated its review with other Administration initiatives, such as the Presidential Memorandum on Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing,[2] and E.O. 13777 on Enforcing the Regulatory Reform Agenda.[3] Notably, Administrator Pruitt established a Regulatory Reform Task Force (RRTF) pursuant to E.O. 13777, which has also served to lead implementation of the Section 2 review required under E.O. 13783.[4]

EPA issued a request for public comments to inform the RRTF on April 11, 2017.[5] As a result of this outreach, EPA received over 460,000 public comments, including a record-breaking number of 63,346 individual responses. Additionally, EPA program offices conducted nearly a dozen public

[1] 82 Fed. Reg. 16093 (Mar. 28, 2017).
[2] 82 Fed. Reg. 8667 (Jan. 30, 2017).
[3] 82 Fed. Reg. 12285 (Mar. 1, 2017).
[4] Memorandum from E. Scott Pruitt, Adm'r, U.S. Envtl Protection Agency, to Acting Deputy Adm'r, U.S. Envtl Protection Agency (Apr. 19, 2017) available at https://epa.gov/laws-regulations/epa-implementation-executive-order-13783-promoting-energy-independence-and-economic
[5] EPA-HQ-OA-2017-0190 available at https://www.regulations.gov/document?D=EPA-HQ-OA-2017-0190-0001.

meetings in April and May to hear directly from stakeholders on EPA regulations and opportunities for reform.[6]

Many of the public comments centered on specific rulemakings and/or specific provisions of rulemakings that may unduly burden domestic energy production and use. Through this robust public feedback, the RRTF identified recurrent themes regarding EPA's energy-related regulations. These general themes included a need for streamlining complex permitting programs, restoring EPA's co-regulatory relationship with the states, increasing transparency pertaining to the economic impact of agency actions, and enhancing EPA's understanding of the entities it regulates.

In an effort to meet the requirements of E.O. 13783, EPA identified four key initiatives that it believes will further the goal of reducing unnecessary burdens on the development and use of domestic energy resources. These initiatives include: (1) comprehensive New Source Review reform, (2) National Ambient Air Quality Standards (NAAQS) reform, (3) robust evaluations of the employment effects of EPA regulations, and (4) a sector-based outreach program. Furthermore, the appendix of this report includes summaries of actions that EPA has already taken on rules identified for review, either specifically or generally, in E.O. 13783. Together, these efforts will help advance the Administrator's vision for EPA while fulfilling the President's goal of promoting domestic energy production and use.

I. New Source Review Reform

The Clean Air Act (CAA) establishes a number of permitting programs designed to reduce air pollution, primarily through the use of pollution control technology. New Source Review (NSR) is a preconstruction permitting program intended to ensure that new and modified stationary sources of air pollution do not significantly degrade air quality. NSR permits are legal documents that establish site-specific requirements that facility owners/operators must observe. The permit specifies what construction is allowed, what emission limits must be met, and often how the emissions source may be operated. There are three types of NSR permits: (1) Prevention of Significant Deterioration (PSD) permits (CAA Title I, Part C), which are required for new major sources or a major source making a major modification in an area that is in attainment with NAAQS air-quality standards; (2) Nonattainment NSR (NNSR) permits (CAA Title I, Part D), which are required for new major sources or major sources making a major modification in a nonattainment area; and (3) Minor source permits (CAA § 110(a)(2)(C)).

The potential costs, complexity, and delays that may arise from the NSR permitting process can slow the construction of domestic energy exploration, production, or transmission facilities that must undergo review. In some circumstances, the NSR process discourages the construction of new

[6] *See* https://www.epa.gov/laws-regulations/regulatory-reform#Public.

facilities or modifications of existing ones that could result in greater environmental improvements. Such reactions to the NSR process slows the growth of domestic energy resources and raise energy costs, among other impacts.

Numerous public comments in response to the request for comments on E.O. 13777, and the Presidential Memorandum on Streamlining Permitting, raised concerns with the NSR program's impact on domestic energy resources. Commenters noted that the NSR permitting process is unduly lengthy and complex. Commenters further stated that the NSR application and construction costs are exceedingly high, to the point of discouraging industry from modernizing facilities for fear of triggering NSR obligations.

Several commenters suggested that EPA should defer to state decisions on the applicability of NSR requirements and other source-specific permitting decisions. Commenters also raised concerns about the availability and cost of emissions offsets in nonattainment areas, and about whether costs will increase as various NAAQS are revised.

Commenters recommended reforms to allow the purchase of offsets from outside a nonattainment area, and inter-pollutant trading. Commenters also urged EPA to better promote and facilitate use of Plant-wide Applicability Limitations, which generally can allow domestic energy production facilities to modify equipment and operations without concerns of triggering NSR requirements. Finally, recommendations included reviewing the debottlenecking rule and re-proposing it to address NSR requirements for modifying sources.

The above comments represent just some of the issues raised in public comments related to NSR. Accordingly, EPA believes opportunities exist to simplify the NSR application and permit process; to review ways to reduce the length of the permitting process; to review burdens created by the current emissions offsets structure; to improve relationships with the states; and to review the "once in, always in" policy to clarify the means by which a facility currently classified as a major source can become an area source.

To address these important areas and achieve meaningful NSR reform, Administrator Pruitt intends to convene an NSR Reform Task Force, details of which will be announced in a forthcoming agency memorandum.

II. National Ambient Air Quality Standards (NAAQS) Reform

Pursuant to the CAA, EPA sets NAAQS for six criteria pollutants: ozone, nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), and lead. In setting the NAAQS, EPA establishes primary standards to protect public health and secondary

standards to protect public welfare. EPA must review and, if appropriate, revise each NAAQS every five years.

After EPA sets a new NAAQS or revises an existing standard for each criteria air pollutant, the CAA requires EPA to determine if areas meet the new standard. Based on monitoring data or modeling, states and tribes submit recommendations to EPA on whether an area meets NAAQS for a criteria pollutant. After reviewing the recommendations and the available information, EPA "designates" an area as attainment or nonattainment (or unclassifiable) for the standard. States develop State Implementation Plans (SIPs) demonstrating that the state has the basic required elements of an air quality program (so-called "infrastructure SIPs" or "i-SIPs") and identifying emissions control requirements the state will rely upon to attain and/or maintain the primary and secondary NAAQS ("attainment" and "maintenance" SIPs).

NAAQS requirements, and revision of the NAAQS standards, have the potential to impact all facilities that emit a NAAQS pollutant or its precursor substances, including those facilities that generate energy from, oil, and natural gas. These facilities can be impacted whether they are in attainment areas or nonattainment areas. As a result, facilities face burdens including higher costs, greater uncertainties in making future plans, and a potential facility closure that not only impacts employment, but also affects communities that rely on the facility.

In response to EPA's request for comments on E.O. 13777, commenters raised concerns with the stringency of some NAAQS, as well as the short review time between revisions. Each new or revised NAAQS requires a host of rules, guidance, and technical support documents for use by state, local, and tribal regulators, as well as industry. The increased frequency of NAAQS revisions results in overlapping requirements that must be implemented in short time spans. Planned and permitted facilities are subject to significant uncertainty, making it difficult to anticipate future air quality improvement requirements and restricting economic growth. Frequent NAAQS revisions may further require that states modify their SIPs before previous standards can be fully implemented, and can also result in permitting delays for new facilities as new air quality assessments are conducted.

Other comments focused on NAAQS implementation issues. Commenters requested that EPA develop implementation guidance that corresponds with NAAQS rulemaking in a timely manner. They recommended that implementation guidance and the various other regulatory and analytic tools be available and final at the time the new or revised NAAQS are promulgated, and not years later, as has repeatedly occurred in recent years. Moreover, uncertainty and delays in guidance and implementation requirements may needlessly obstruct energy expansion and modernization of existing facilities.

Concerns were further expressed regarding the unnecessary burden arising from the development and revision of SIPs, and the chronic backlog of federal SIP approvals. At the end of fiscal year 2016,

EPA had a backlog of 322 SIPs.[7] Commenters noted that many state SIP submittals remain without EPA action for years, and that the process for developing, submitting and approving SIPs is inefficient and outdated. Commenters also noted that EPA will second-guess state permitting decisions, affecting state control of the process and introducing delays and financial risks for companies seeking permits. Comments further recommended EPA defer to state authorities for source-specific decisions and, therefore, readjust its focus to overarching guidance and policy.

Commenters additionally questioned specific NAAQS – particularly the 2015 ozone standard – which approach background concentrations in some regions. Other commenters articulated concerns regarding monitoring and modeling issues, international and long-range ozone transport, stratospheric ozone intrusions, and exceptional events.

EPA received recommendations to revise the exceptional events rule and associated guidance to allow for greater state flexibility in flagging and excluding exceptional events in the data set used to determine compliance with NAAQS. Exceptional events are unusual or naturally occurring actions that can affect air quality, but are not reasonably controllable using techniques that may be implemented to attain and maintain NAAQS. Exceptional events include wildfires, stratospheric ozone intrusions, and volcanic and seismic activities.

To review the issues related to the ozone NAAQS, the Administrator formed the Ozone Cooperative Compliance Task Force. Among its priorities, the Task Force is reviewing administrative options to enable states to enter into cooperative agreements with EPA to provide regulatory relief and meaningfully improve ozone air quality. Moreover, EPA plans to work to streamline SIP approvals through a nationally consistent process that includes setting performance targets, and better monitoring progress on SIP reviews. EPA further plans to work to eliminate the SIP backlog.

III. Employment Evaluations

Regulatory costs impose tremendous burdens on American businesses, employees, and consumers – particularly within the energy sector. In its *2015 Report to Congress on the Benefits and Costs of Federal Regulations and Agency Compliance with the Unfunded Mandates Reform Act*, the Office of Management and Budget estimated that the total annual cost of EPA regulations from October 1, 2004 through September 30, 2014 stood between $37.6 and $45.4 billion (2010$).[8] These costs may impact business development and expansion, as well as capital investment and employment patterns.

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[7] *Fiscal Year 2018 Justification of Appropriation Estimates for the Committee on Appropriations*, U.S. ENVTL PROTECTION AGENCY, EPA-190-K-17-002 (May 2017) available at https://www.epa.gov/sites/production/files/2017-06/documents/fy18-cj-14-program-performance.pdf

[8] OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, *2015 Report to Congress on the Benefits and Costs of Federal Regulations and Agency Compliance with the Unfunded Mandates Reform Act* (2015), available at https://obamawhitehouse.archives.gov/sites/default/files/omb/inforeg/2015_cb/2015-cost-benefit-report.pdf.

In the CAA,[9] the Clean Water Act,[10] the Toxic Substance and Control Act,[11] Solid Waste Disposal Act,[12] and the Comprehensive Environmental Response, Compensation, and Liability Act,[13] Congress expressed its intent that EPA conduct continuing evaluations of potential losses or shifts of employment that may result from implementation of these statutes.[14] However, the Agency historically has not conducted these assessments. EPA acknowledges the importance of considering the cumulative effects of its regulations on the American public. Accordingly, EPA intends to conduct these evaluations consistent with the statutes.

IV. Smart Sectors

To accomplish the goals of E.O. 13783, EPA acknowledges that it must work to develop better relationships with the regulated community to close information gaps through informal means. Engaging these stakeholders in a collaborative manner to understand technological advancements or to coordinate on regulatory developments could reduce conflicts that complicate the rulemaking process.

Accordingly, EPA recently announced its *Smart Sectors* program to re-examine how it engages with industry to reduce unnecessary regulatory burdens, improve regulatory forecasting and predictability, and improve the ability of both EPA and industry to conduct long-term regulatory planning while also improving the environment and public health.[15] EPA initially identified thirteen sectors to work with, including ones directly related to oil and gas, utilities, mining, power generation, and the automotive industry.

The *Smart Sectors* program designates staff-level points of contact who are highly knowledgeable about specific industries. These individuals will act as liaisons among industry trade associations and companies, EPA program and regional offices, state and local governments, and other stakeholder groups. The sector liaisons will focus their attention on three main areas: building relationships and improving customer service to sectors; developing additional expertise in each industry's operations and environmental performance; and informing the planning of future policy, regulations, and Agency processes.

EPA anticipates that participating industries will benefit from coordinated, cooperative, and constructive problem-solving with government. The Agency will invite participating industries to

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[9] 42 U.S.C.§7621.
[10] 33 U.S.C. §1367.
[11] 15 U.S.C. §2622.
[12] 42 U.S.C. §7001(e).
[13] 42 U.S.C. §9610.
[14] 42 U.S.C. §7621(a); 33 USC §1367(e); 42 U.S.C. §700142 U.S.C. §9610(e).
[15] *See* https://www.epa.gov/smartsectors.

engage in active dialogue and offer their own innovative ideas to reduce environmental impacts. Beginning in January 2018, EPA plans to release monthly updates on its *Smart Sectors* website with data and other information.

Conclusion

Multiple ways exist for EPA to protect the environment and public health while supporting the President's policy to promote economic growth and energy independence. The four key initiatives identified herein will advance the goal of reducing unnecessary regulatory burdens on the development and use of domestic energy resources in accordance with E.O. 13783. These initiatives also illustrate meaningful progress towards fulfilling Administrator Pruitt's efforts to satisfy EPA's core mission through increased transparency, public participation, and cooperative federalism.

APPENDIX

This appendix includes summaries of the actions that EPA has taken on (1) rules that were identified specifically for review in E.O. 13783; and (2) other energy-related rules identified for review by EPA pursuant to E.O. 13783.

I. Rules Identified Specifically in E.O. 13783

A. Clean Power Plan and Related Rules

E.O. 13783 Section 4 addresses the Clean Power Plan and related rules that affect the electric utility sector, particularly utilities' fossil fuel-fired power plants – i.e., primarily coal and natural gas. EPA initiated a review of the two identified final rules and withdrew a proposed rule.

1. Carbon Emission Guidelines for Existing Stationary Sources (Clean Power Plan)

On October 23, 2015, EPA issued a final rule, "Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units" (Clean Power Plan or CPP).[16] This rule established the first-ever standards for states to follow in developing plans to reduce greenhouse gas (GHG) emissions from existing fossil fuel-fired electric generating units (EGUs). Affected domestic energy resources include oil, natural gas, and coal.

On February 9, 2016, the U.S. Supreme Court issued an unprecedented stay of the CPP implementation pending judicial review.[17] Following a full briefing on the merits, oral argument was held before the D.C. Circuit, sitting *en banc*, on September 27, 2016. The case is currently pending in the D.C. Circuit.

Pursuant to E.O. 13783, on March 28, 2017, Administrator Pruitt signed a notice to review this final rule.[18] On March 28, 2017, the Department of Justice requested that the D.C. Circuit hold in abeyance the litigation regarding the CPP. On April 28, 2017, the D.C. Circuit ordered the litigation regarding the CPP be held in abeyance for 60 days.[19] On May 15, 2017, the Department of Justice submitted a supplemental brief to the Court urging the Court to continue to hold the cases in abeyance while EPA conducts its review of the CPP.[20] On June 6, 2017, EPA submitted a CPP proposal to OMB.[21] On August 8, 2017, the D.C. Circuit ordered litigation be held in abeyance for an additional

[16] 80 Fed. Reg. 64661 (Oct. 23, 2015).
[17] *West Virginia v. EPA*, U.S., No. 15A773 (Feb. 9, 2016).
[18] 82 Fed. Reg. 16329 (Apr. 4, 2017).
[19] *West Virginia v. EPA*, D.C. Cir. *en banc*, No. 1673071 (Apr. 28, 2017).
[20] *West Virginia v. EPA*, D.C. Cir. *en banc*, No, 1675243 (May 15, 2017).
[21] https://www.reginfo.gov/

60 days.[22] On October 10, 2017, Administrator Pruitt signed a Notice of Proposed Rulemaking proposing to repeal the CPP.[23] The public comment period closes on December 15, 2017. On October 10, 2017, EPA also submitted an advanced notice of proposed rulemaking, State Guidelines for Greenhouse Gas Emissions from Existing Electric Utility Generating Units, to OMB.[24]

2. Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources

On October 23, 2015, EPA issued a final rule, "Standards of Performance for Greenhouse Gas Emissions from New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units."[25] This rule established standards for emissions of carbon dioxide (CO_2) for newly constructed, modified, and reconstructed affected fossil fuel-fired EGUs. Affected domestic energy resources include oil, natural gas, and coal.

Pursuant to E.O. 13783, on March 28, 2017, Administrator Pruitt signed a notice to review the final rule.[26] On March 28, 2017, the Department of Justice requested that the D.C. Circuit hold in abeyance the litigation regarding the rule, including the scheduled April 17, 2017, oral arguments.[27] On March 30, 2017, the D.C. Circuit granted the request to hold the litigation in abeyance.[28]

3. Federal Plan/Model Trading/Framework Rule

On October 23, 2015, in connection with the CPP, EPA published a proposed rule, "Federal Plan Requirements for Greenhouse Gas Emissions From Electric Utility Generating Units Constructed on or Before January 8, 2014; Model Trading Rules; Amendments to Framework Regulations; Proposed Rule."[29] This rule proposed (1) a Federal plan to implement the CPP emission guidelines, (2) model trading rules to aid implementation of the guidelines, and (3) amendments to the existing framework regulations implementing CAA §111(d). Affected domestic energy resources include oil, natural gas, and coal.

Pursuant to E.O. 13783, on March 28, 2017, Administrator Pruitt signed a notice withdrawing these proposed rules.[30] The notice also included the withdrawal of the proposed design details of the Clean Energy Incentive Program (CEIP) under the CPP.[31]

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[22] *West Virginia v. EPA*, D.C. Cir. *en banc*, No. 1687838 (Aug. 8, 2017).
[23] 80 Fed. Reg. 48035 (Oct. 16, 2017).
[24] https://www.reginfo.gov/
[25] 80 Fed. Reg. 64509 (Oct. 23, 2015).
[26] 82 Fed. Reg. 16330 (Apr. 4, 2017).
[27] *North Dakota v. EPA*, D.C. Cir., No. 1668276 (Mar. 28, 2017).
[28] *North Dakota v. EPA*, D.C. Cir., No. 1668612 (Mar. 30, 2017).
[29] 80 Fed. Reg. 64966 (Oct. 23, 2015).
[30] 82 Fed. Reg. 16141 (April 3, 2017).
[31] 81 Fed. Reg. 42940 (June 30, 2016).

B. Methane Emissions Standards for Oil and Natural Gas Sector

On June 3, 2016, EPA issued a final rule, "Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources."[32] This rule included amendments to the existing standards for the oil and natural gas source category (subpart OOOO) and set first-time standards for both GHGs (specifically methane) and volatile organic compounds (VOC) (subpart OOOOa).

Pursuant to E.O. 13783, on March 28, 2017, Administrator Pruitt signed a notice to review the final rule.[33] On April 7, 2017, the Department of Justice requested that the D.C. Circuit hold in abeyance the litigation regarding the oil and gas methane rule, including the scheduled oral arguments.[34] On May 18, 2017, the D.C. Circuit granted the request to hold the litigation in abeyance until EPA has completed its review and reconsideration of the 2016 rule.[35]

On April 18, 2017, Administrator Pruitt signed a letter that announced EPA's intent to convene a proceeding for reconsideration of the following objections relative to the fugitive emissions requirements: (1) the applicability of the fugitive emissions requirements to low production well sites, and (2) the process and criteria for requesting and receiving approval for the use of an alternative means of emission limitations (AMEL) for purposes of compliance with the fugitive emissions requirements in the 2016 rule.[36] On May 26, 2017, Administrator Pruitt signed a notice of reconsideration related to (1) the requirements for certification of closed vent system by a professional engineer, and (2) the well site pneumatic pump standards, and a partial stay of the rule requirements pending reconsideration.[37]

On June 12, 2017, Administrator Pruitt signed a proposed rulemaking for a three-month stay[38] and a separate notice proposing a two-year stay.[39] EPA currently has supplemental notices to these proposals under OMB interagency review.[40, 41]

II. Other Energy-Related Rules Identified by EPA

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[32] 81 Fed. Reg. 35824 (June 3, 2016).
[33] 82 Fed. Reg. 16331 (Apr. 4, 2017).
[34] *API v. EPA*, No. 13-1108 (and consolidated cases), D.C. Cir., No. 1670157 (Apr. 7, 2017).
[35] *API v. EPA*, No. 13-1108 (and consolidated cases), D.C. Cir., No. 1675813 (May 18, 2017).
[36] EPA Administrator E. Scott Pruitt, letter to API et al. (Apr. 18, 2017).
[37] 82 Fed. Reg. 25734 (June 5, 2017). Note that the D.C. Circuit vacated the 90 day stay on July 3, 2017. The court also emphasized that nothing in its opinion limits EPA's authority to reconsider the oil and gas standards and to proceed with its June 16, 2017 proposed two-year stays of certain requirements in the rule.
[38] 82 Fed. Reg. 27641 (June 16, 2017).
[39] 82 Fed. Reg. 27645 (June 16, 2017).
[40] https://www.reginfo.gov/
[41] https://www.reginfo.gov/

As noted previously, the Administration has initiated several regulatory reform efforts, allowing EPA to leverage the ideas and information collected from those efforts to support and focus its activities to alleviate unnecessary burdens on the domestic energy sector. Public input has been received in response to both the Department of Commerce's request for information (RFI) regarding the Presidential Memorandum Streamlining Permitting and Reducing Regulatory Burdens for Domestic Manufacturing,[42] and EPA's request for comment pursuant to E.O. 13777 in order to identify regulations that may be appropriate for repeal, replacement, or modification. EPA has screened each docket for comments with substantive, specific suggestions to remove regulatory burdens on the development or use of domestic energy resources. As part of this effort, the RRTF has identified the following additional energy-related actions EPA has taken:

A. Oil and Gas Information Collection Request

On November 10, 2016, EPA sent an information collection request (ICR) to more than 15,000 owners and operators in the oil and gas industry, requiring them to provide information on equipment inventories and methane emissions. This ICR conducted pursuant to CAA §114 was to assist the Agency in developing emissions standards for existing oil and gas facilities pursuant to CAA §111(d).[43]

On March 2, 2017, Administrator Pruitt withdrew the ICR.[44] The withdrawal will allow EPA to assess the need for the information that the Agency was collecting through these requests, and reduce burdens on businesses while the Agency assesses such need. EPA estimated the burden of the information collection to be 284,751 hours, costing $42,453,050. Due to some facilities submitting responses to the ICR prior to the withdrawal, EPA estimated that the withdrawal saved approximately $37 million in reporting burden. Affected domestic energy resources include oil and natural gas.

B. Mid-Term Evaluation for Light-Duty Vehicle Greenhouse Gas Emissions Standards

In 2012, EPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) set GHG emissions and Corporate Average Fuel Economy (CAFE) standards for model year (MY) 2017 and beyond for light-duty vehicles.[45] The 2012 joint rulemaking included a regulatory requirement for EPA to conduct a Mid-Term Evaluation (MTE) of the GHG standards established for MY 2022-2025 to assess whether the standards were appropriate no later

[42] The RFI resulted in 170 comments. Most EPA-relevant comments focused on air permitting programs (e.g. NSR, Title V, SSM, etc.).
[43] EPA ICR No. 2548.01.
[44] 82 Fed. Reg. 12817 (Mar. 7, 2017).
[45] 77 Fed. Reg. 62624 (Oct. 15, 2012).

than April 1, 2018. On January 12, 2017, EPA issued, "Final Determination on the Appropriateness of the Model Year 2022-2025 Light-duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation."[46] This action determined that the GHG emission standards for MY 2022-2025 light-duty vehicles were appropriate.

On March 15, 2017, Administrator Pruitt and Department of Transportation Secretary Elaine Chao announced that they intended to reconsider the final determination in order to allow for additional consultation and coordination, to ensure that the record is based on the best available data, and consistent with the schedule prescribed by the 2012 regulation. A formal notice of reconsideration was published in the Federal Register on March 22, 2017.[47] On August 21, 2017, EPA and DOT issued a request for public comment on its reconsideration of the Final Determination and invited stakeholders to provide any relevant comments, data, and information to inform the reconsideration.[48]

In accordance with the schedule set forth in EPA's regulations, the Agency intends to make a new Final Determination regarding the appropriateness of the MY 2022-2025 Light-duty Vehicle GHG Emissions Standards no later than April 1, 2018.

C. Steam Electric Effluent Limitations Guidelines

On November 3, 2015, EPA issued a final rule "Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category."[49] This rule contained limitations and standards on various wastestreams at steam electric power plants: fly ash transport water, bottom ash transport water, flue gas mercury control wastewater, flue gas desulfurization (FGD) wastewater, gasification wastewater, and combustion residual leachate. This action affects domestic coal resources.

EPA received seven petitions for review of the 2015 Steam Electric ELG rule. On December 8, 2015, the United States Judicial Panel on Multi-District Litigation issued an order consolidating all of the petitions in the U.S. Court of Appeals for the Fifth Circuit.[50]

On April 11, 2017, the Administrator sent a letter to each state governor notifying them of the Agency's intent to consider postponing compliance dates as well as petitions for reconsideration of the final rule.[51] On April 12, 2017, the Administrator announced EPA's decision to reconsider the

[46] 81 Fed. Reg. 87927 (Jan. 12, 2017).
[47] 82 Fed. Reg. 14671 (Mar. 22, 2017).
[48] 82 Fed. Reg. 39551 (Aug. 21, 2017).
[49] 80 Fed. Reg. 67838 (Nov. 3, 2015).
[50] *Southwestern Electric Power Co., et al. v. EPA*, 5th Citr. (Dec. 8, 2015).
[51] EPA Administrator E. Scott Pruitt, letter to Virginia Governor Terry McAuliffe (Apr. 11, 2017).

final rule and, using authority under the Administrative Procedure Act §705, to postpone compliance dates that have not yet passed pending judicial review.[52] On September 18, 2017, EPA issued a final rule postponing compliance deadlines relating to FGD wastewater and bottom ash transport water from November 1, 2018, to November 1, 2020, while the Agency reconsiders those wastestreams in the 2015 rule.[53]

D. Coal Combustion Residuals

On April 17, 2015, EPA issued a final rule, "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule."[54] This rule establishes minimum national criteria under subtitle D of the Resource Conservation and Recovery Act (RCRA) for Coal Combustion Residuals (CCR) landfills and surface impoundments at active coal-fired power plants. This action affects domestic coal resources.

Subsequent to the promulgation of the 2015 CCR rule, various environmental and industry groups submitted to the D.C. Circuit seven separate petitions for review, which have been consolidated into a single action. On June 14, 2016, the D.C. Circuit remanded with vacatur to EPA specific provisions of the rule for further consideration.[55] EPA is planning to issue a proposal to address those rule provisions by the end of 2017.[56]

On December 16, 2016, the President signed the Water Infrastructure Improvements for the Nation (WIIN) Act,[57] which included language giving state agencies the authority to implement and enforce coal ash regulations under the 2015 CCR Final rule through EPA-approved state permit programs. The WIIN Act also gives EPA the authority to regulate coal ash in states that choose not to implement state permitting programs and in states whose permitting programs are determined to be inadequate by EPA. EPA has direct implementing authority in Indian country.

On April 28, 2017, Administrator E. Scott Pruitt sent letters informing states that EPA was working on guidance for implementing state permitting programs under WIIN that allow flexibility in individual permits to manage the safe disposal of CCR. On August 15, 2017, EPA issued Interim Final Guidance for State CCR Permit Programs.[58] On September 14, 2017, EPA announced its intent

[52] 82 Fed. Reg. 19005 (Apr. 25, 2017).
[53] 82 Fed. Reg. 43494 (Sept. 18, 2017).
[54] 80 Fed. Reg. 21302 (Apr. 17, 2015).
[55] *Utility Solid Waste Activities Group v. EPA*, D.C. Cir. (June 14, 2016).
[56] https://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201704&RIN=2050-AG88.
[57] P.L. 114-322.
[58] 82 Fed. Reg. 38685 (Aug. 15, 2017).

to reconsider several substantive provisions of the rule, as part of its rulemaking pursuant to the D.C. Circuit remand.[59]

E. Waters of the United States

On June 29, 2015, EPA issued a final rule, "Clean Water Rule: Definition of 'Waters of the United States'" (WOTUS).[60] The WOTUS rule is a definitional rule that affects the scope of the "waters of the United States;" it does not establish any regulatory requirements or directly mandate actions on its own. However, by changing the definition of the "waters of the United States," the rule changes the waters where other regulatory requirements that affect regulated entities come into play (i.e., the locations where regulated entities would be required to obtain certain types of permits). As a result, this action would have had wide-ranging effects on domestic energy production and use, including the permitting of oil, gas, coal, and renewable development sites, and the transmission and distribution of electricity.

Due to concerns about the potential for regulatory uncertainty, as well as the scope and legal authority of the 2015 WOTUS rule, 31 states and a number of other parties sought judicial review in multiple actions. On October 9, 2015, the U.S. Court of Appeals for the Sixth Circuit stayed the 2015 WOTUS rule nationwide pending further action of the court.[61]

On February 28, 2017, President Trump signed E.O. 13778 – Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the "Waters of the United States" Rule, which directed EPA and the U.S. Army Corp of Engineers to review the 2015 WOTUS rule.[62]

On June 27, 2017, EPA and the Army Corps signed a proposed rulemaking to repeal the 2015 WOTUS rule.[63] As indicated in the proposed withdrawal, the agencies are implementing E.O. 13778 in two steps to provide as much certainty as possible as quickly as possible to the regulated community and the public during the development of the ultimate replacement rule. In Step 1, the agencies are taking action to establish the legal status quo in the Code of Federal Regulations, by re-codifying the regulation that was in place prior to issuance of the 2015 rule. In Step 2, the agencies plan to propose a new definition that would replace the approach in the 2015 rule.

EPA has initiated programmatic staff workgroups to recodify the regulation that was in place prior to the 2015 WOTUS rule and consider a new definition that would replace the approach in the

[59] EPA Press Release, "EPA to Reconsider Certain Coal Ash Rule Provisions" (Sept. 14, 2017).
[60] 80 Fed. Reg. 37054 (June 29, 2015).
[61] *Ohio v. U.S. Army Corps of Eng'rs.*, 6th Cir. (Oct. 9, 2015).
[62] 82 Fed. Reg. 12497 (Mar. 3, 2017).
[63] 82 Fed. Reg. 34899 (July 27, 2017) (NPRM).

WOTUS rule with one that reflects the principles that Justice Scalia outlines in the *Rapanos* plurality opinion.