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# Testimony

**of Ross Eisenberg**

Vice President

Energy and Resources Policy

National Association of Manufacturers

*before the* Senate Committee on Environment and Public Works  
Subcommittee on Clean Air and Nuclear Safety

on "Oversight Hearing: EPA's Proposed National Ambient Air Quality Standards  
for Ozone"

December 17, 2014



**TESTIMONY OF ROSS EISENBERG**  
**BEFORE THE SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS**  
**SUBCOMMITTEE ON CLEAN AIR AND NUCLEAR SAFETY**

Hearing on:  
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**DECEMBER 17, 2014**

Good morning, Chairman Whitehouse, Ranking Member Sessions and members of the Subcommittee on Clean Air and Nuclear Safety. My name is Ross Eisenberg, and I am 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 at today’s hearing on the Environmental Protection Agency’s (EPA) proposed National Ambient Air Quality Standards (NAAQS) for ground-level ozone.

Manufacturers have demonstrated a commitment to protecting the environment through greater sustainability, increased energy efficiency and reducing emissions. We are building cleaner and more efficient automobiles. Since 1990, highway vehicle emissions of the primary precursors of ozone, nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC), are down are down 48 and 30 percent respectively,<sup>1</sup> while an additional 60 million vehicles

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<sup>1</sup> EPA, National Emissions Inventory (NEI) Air Pollutant Emissions Trends Data, February 2014.

have been added to U.S. roadways over the same time period.<sup>2</sup> We are operating cleaner and more efficient factories: since 1990, manufacturers' NO<sub>x</sub> emissions are down 52 percent and VOC emissions have been reduced by 70 percent,<sup>3</sup> while our value added to the economy has more than doubled.<sup>4</sup> As a country, ozone levels are down nearly 25 percent since 1990<sup>5</sup> and our economy has grown by 43 percent.<sup>6</sup> With the right policies and a balance between environmental ambition and technological feasibility, we can have both a clean environment and a prosperous economy. However, when policymakers push beyond the limits of what is technologically feasible, the critical balance between environmental improvement and economic growth is lost and manufacturers and the economy will suffer.

Increasingly, we are losing that balance. More and more, the EPA is proposing regulations that are beyond the bounds of innovation putting manufacturers and other industries in a position where the only available compliance strategy, unless policies are modified, is closing up shop. When EPA first issued its Boiler MACT regulation,<sup>7</sup> the standards were so unrealistic that that no single boiler could meet all of the rule's requirements.<sup>8</sup> In 2012<sup>9</sup> and then

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<sup>2</sup> U.S. Department of Transportation, Office of the Assistant Secretary for Research and Technology, Bureau of Transportation Statistics, National Transportation Statistics, Table 1-11: Number of U.S. Aircraft, Vehicles, Vessels, and Other Conveyances.

<sup>3</sup> EPA, National Emissions Inventory (NEI) Air Pollutant Emissions Trends Data, February 2014.

<sup>4</sup> U.S. Department of Commerce, Bureau of Economic Analysis, Value Added by Industry.

<sup>5</sup> EPA, Air Quality Trends. <http://www.epa.gov/airtrends/aqtrends.html#comparison>

<sup>6</sup> U.S. Department of Commerce, Bureau of Economic Analysis, Gross Domestic Product by Year.

<sup>7</sup> EPA, Nation Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters, 75 Federal Register 32006 (June 4, 2010) (EPA Docket Number OAR-2002-0058)

<sup>8</sup> See comments filed by the National Association of Manufacturers on August 23, 2010.

<sup>9</sup> EPA, Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA -HQ-OAR-2011-0660; FRL-9654-7, 77 Fed. Reg. 22,392 (April 13, 2012)

again in 2014,<sup>10</sup> the EPA proposed New Source Performance Standards (NSPS) for new coal-fired utilities at levels that were neither being achieved in practice nor which could be achieved by any commercially available technology.<sup>11</sup> Now, the EPA has proposed new ozone standards for which it can only identify 60 percent of the necessary technologies to achieve a 65 parts per billion (ppb) standard, while relying on so called “unknown controls” for 40 percent of its path to compliance.<sup>12</sup> This is not a balanced policy. This is not an achievable rule.

The NAM opposes the EPA’s proposed revisions to the NAAQS for ozone. This proposal is likely to be the most expensive regulation ever, regardless of the point in the proposed range of 65 to 70 parts per billion (ppb) the Administrator ultimately lands. A substantial portion of the compliance with a new standard will come from controls that are unknown even to the EPA, and if these controls are not invented in time, manufacturers will be forced to consider scrapping existing plants and equipment. Manufacturers operating in newly-designated nonattainment areas could be effectively closed off to any new growth, and even manufacturers in areas in compliance with the new standards will struggle to model attainment and obtain their new permits. No sector will be spared, and the nation’s manufacturing comeback—driven largely by an advantage on energy—could be placed in jeopardy.

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<sup>10</sup> EPA, Standards of Performance for Greenhouse Gas Emissions From New Stationary Sources: Electric Utility Generating Units, Docket ID No. EPA –HQ–OAR–2013–0495; FRL–9839–4, 79 Fed. Reg. 1,430 (January 8, 2014)

<sup>11</sup> See NAM Comments filed May 9, 2014.

<sup>12</sup> EPA, Regulatory Impact Analysis of the Proposed Revision to the National Ambient Air Quality Standards for Ground-Level Ozone, pp. ES-8, ES-9 (November 2014).

The current standard of 75 ppb and dozens of other recent regulations on power plants, manufacturers, vehicles and fuels are already causing manufacturers to make dramatic reductions in ozone over the next several years, reductions that will protect public health. They will also impose significant new costs. Manufacturers support reasonable regulation, but at some point the costs of manufacturing in the United States will make it impossible for manufacturers to stay in business. A strict new ozone NAAQS may be that tipping point.

The Clean Air Act has been successful in improving air quality across the United States over the past four decades. However, incremental improvements in ozone are now coming at exponential cost. A NAAQS process that does not allow the Administrator to consider cost or technical feasibility is no longer productive. As the sun sets on the 113<sup>th</sup> Congress and the members of this Subcommittee focus on priorities for the 114<sup>th</sup> Congress, the NAM urges you to consider ways to improve the ozone NAAQS process so that we can protect public health while also protecting the economy and our nation's manufacturing base.

### **Manufacturers Are Already Making Major Emissions Reductions**

Ground-level ozone is formed through a chemical reaction when NO<sub>x</sub> and VOCs interact with sunlight. Emissions from power plants, industrial facilities, automobiles, gasoline vapors and solvents are all sources of NO<sub>x</sub> and VOCs. Natural sources, such as plant life and fires, also contribute to the formation of ozone; today, given how much ozone levels in the United States have already

been reduced, a significant portion of a given area's ozone concentration is made up of natural background ozone and ozone that has traveled from other states and, increasingly, from overseas.

Under the Clean Air Act, the EPA is instructed to select a primary NAAQS for ground-level ozone that protects the nation's public health within an "adequate margin of safety." In March 2008, the EPA lowered the primary NAAQS for ground-level ozone from 84 ppb to 75 ppb.

EPA groups the sources of man-made ground-level ozone into four main categories: (1) onroad and nonroad mobile sources; (2) industrial processes (including solvents); (3) consumer and commercial products; and (4) the electric power industry. These sectors have taken or will take major steps to reduce NO<sub>x</sub> and VOCs over the past few decades by complying with the following regulations:

#### Mobile Sources

- New emissions standards under title II of the Clean Air Act, 42 U.S.C. 7521–7574, for numerous classes of automobile, truck, bus, motorcycle, earth mover, aircraft, and locomotive engines, and for the fuels used to power these engines;
- New EPA standards for locomotive and for marine diesel engines;
- New standards for Category 3 (C3) engines installed on U.S. ocean-going vessels and to marine diesel fuels produced and distributed in the U.S.;
- New greenhouse gas and fuel efficiency standards from EPA and the National Highway Transportation Safety Administration for new 2014-2018 model year medium and heavy-duty engines and vehicles; and
- New EPA Tier 3 standards for tailpipe and evaporative emissions from passenger cars, light-duty trucks, medium-duty passenger vehicles, and some heavy-duty vehicles.

### Industrial Processes

- Maximum achievable control technology (MACT), reasonably available control technology (RACT), and best available control technology (BACT) standards for a wide range of industrial categories, including combustion sources, coating categories, and chemical manufacturing;
- New EPA emission standards and fuel requirements for new stationary engines;
- New EPA regulations for commercial, industrial and solid waste incinerators, which set standards for NO<sub>x</sub> and several air toxics for all commercial incinerators, as required under Section 129 of the Act;
- New air toxics rules for industrial boilers, which will yield co-benefit NO<sub>x</sub> reductions as a result of tune-ups and energy efficiency measures, especially from boilers that burn coal; and
- Several new source performance standards and air toxics standards, including upcoming review and revisions for gas turbines and municipal waste combustors and proposed requirements for the petroleum refining industry.

### Consumer and Commercial Products

- New national VOC emission standards for aerosol coatings;
- Review and revision of existing rules for household and institutional consumer products, architectural and industrial maintenance coatings, and automobile refinish coatings;
- Control techniques recommendations issued in 2008 for four additional categories of consumer and commercial products, such as surface coatings and adhesives used in industrial manufacturing operations; and
- Energy Star, a joint program of the EPA and the U.S. Department of Energy, which encourages energy efficient products and practices.

### Electric Power Sector

- The EPA's Clean Air Interstate Rule (CAIR) and its successor, the Cross-State Air Pollution Rule (CSAPR);

- New Source Performance Standards (NSPS) for electric generating units;
- Prevention of Significant Deterioration (PSD) or Nonattainment New Source Review (NNSR) requirements;
- The Mercury and Air Toxics Standard (MATS) rule; and
- Regional Haze best available retrofit technology (BART) determinations.

Manufacturers' responses to these regulations, combined with market-driven innovation and other dynamics, have reduced and will continue to reduce NO<sub>x</sub> and VOC emissions substantially. In 1990, 25.2 million tons of NO<sub>x</sub> were emitted in the U.S.; by 2013, this total was cut by almost half, down to 12.9 million tons. Factoring in the current ozone standard of 75 ppb, total U.S. NO<sub>x</sub> emissions will be driven down to 9.7 million tons by 2018.

Even in the absence of new ozone regulations, NO<sub>x</sub> emissions will be roughly 25 percent lower in 2018 than they are today, and over 60 percent lower than they were in 1990. Manufacturers are making the air cleaner and will continue to do so, and we are doing it *without* having to revise the ozone standard any further.

### **Tighter Ozone Standard Could Be the Most Expensive Regulation Ever**

When the EPA sought to tighten the ozone standard to a range between 60 and 70 ppb in 2011, its own estimate of the cost of the rule ranged from \$19-25 billion (at 70 ppb) to \$32-44 billion (at 65 ppb) to \$90 billion (at 60 ppb) per year.<sup>13</sup> At these estimates, any of these would have been the most expensive regulation of all time, and would have presented major cost and attainment

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<sup>13</sup> [http://www.epa.gov/glo/pdfs/201107\\_OMBdraft-OzoneRIA.pdf](http://www.epa.gov/glo/pdfs/201107_OMBdraft-OzoneRIA.pdf).

challenges for manufacturers. Moreover, the EPA's analysis was incomplete: it left out costs for California, the nation's largest economy, and it provided little justification for what appeared to be an unrealistically low cost estimate for "unknown controls" needed to comply with the rule. With a 2014 review looming and with environmental and health groups pressing for a range of 55 to 60 ppb, our members asked us to hire experts to determine whether any of these limits were feasible and what the cost would be.

After an exhaustive search, the NAM retained David Harrison, Jr., Ph.D, and Anne E. Smith, Ph.D, of NERA Economic Consulting to model the impacts of a new ozone regulation set at 60 ppb. We asked Dr. Harrison and Dr. Smith to perform two study objectives: (1) estimate the costs and economic impacts of a 60 ppb ozone standard using the best available information from the EPA and other sources; and (2) identify any gaps in existing EPA literature and analysis that would prevent the Agency from accurately assessing the economic impacts of the regulation.

NERA's results were startling. A standard of 60 ppb would be absolutely devastating to manufacturers and to the economy as a whole. Specifically, NERA found that a 60 ppb standard would:

- Reduce gross domestic product (GDP) by about \$3.4 trillion on a present value basis (as of 2014) and by \$270 billion per year on an annualized basis (spread evenly from 2017 to 2040);
- Reduce average annual household consumption—money that would normally be spent on food, clothes or other consumer goods—by about \$1,570 per household per year;
- Result in 2.9 million less job-equivalents per year;

- Cause the retirement of 101 gigawatts (GW) of additional coal-fired capacity, about one-third of the coal fleet; and
- Increase industrial electricity prices by 5.5 percent and industrial natural gas prices by 12 percent.

In addition, oil and natural gas producers in areas that become in nonattainment under a tighter ozone standard might face new requirements, such as the need to obtain air permits as well as emissions reduction credits, or offsets, for NO<sub>x</sub> and/or VOCs, in order to develop new wells. If such barriers to new well development do emerge, the projected economic impacts of a 60 ppb ozone standard could be even higher:

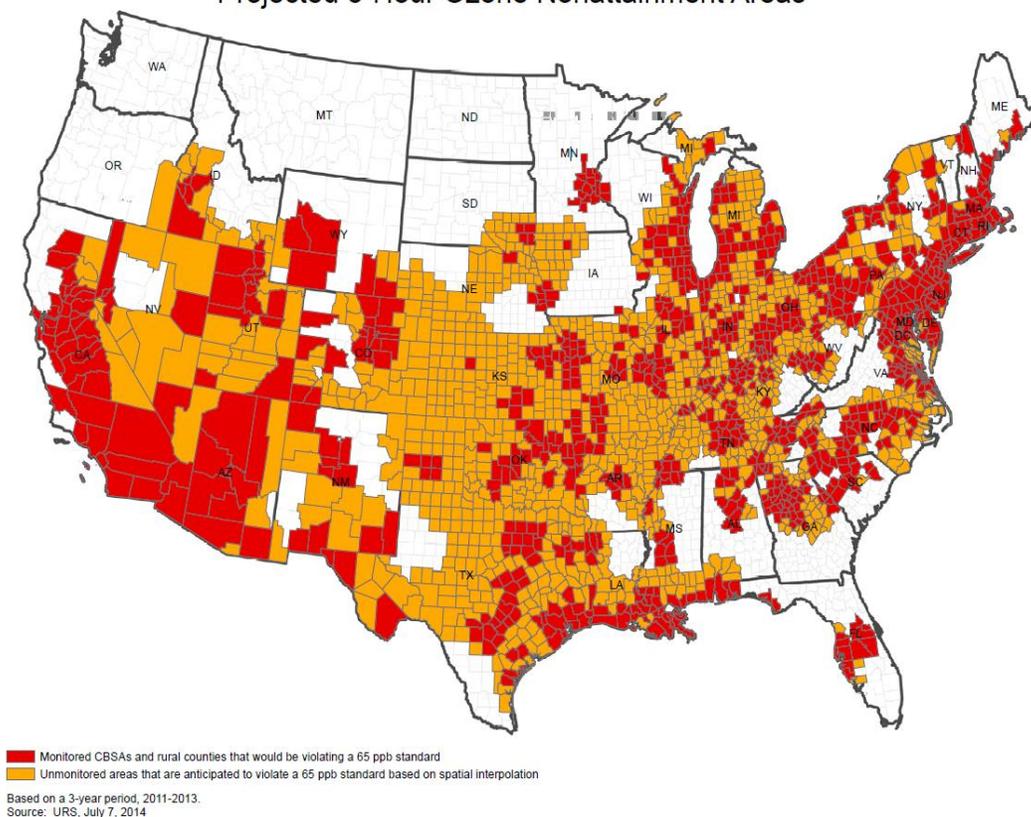
- GDP reduced by nearly \$4.5 trillion across the 2017-2040 study period;
- Average annual household consumption is reduced by \$2,040 per year;
- Industrial electricity prices could increase by 23 percent; and
- Industrial natural gas prices could increase by 52 percent.

For manufacturers, particularly those in energy-intensive sectors, such as iron and steel, cement, aluminum, pulp and paper and chemicals, energy cost increases at these levels would be devastating in their ability to compete internationally.

### **Nonattainment Means No Growth**

A new ozone standard means that, as soon as 2017, many new areas across the United States will be thrust into “nonattainment.”

## Projected 8-Hour Ozone Nonattainment Areas



The map above, which assesses attainment of a 65 ppb standard, looks substantially different than the one the EPA produced when it rolled out the rule in November. The differences are that EPA's map is what the Agency projects attainment to look like in 2025—ten years after the rule is finalized, and eight years after initial attainment designations are made; and only accounts for counties with monitored data. The map above was compiled using current monitored data as well as modeling projections of air quality, and is a more accurate reflection of how the map would look in 2017 when counties are designated nonattainment.

Why does this matter? Because nonattainment is a significant barrier to growth. Nonattainment is a significant deterrent to manufacturers to build or expand in an area, because the permits are so difficult to obtain versus an attainment area. Companies building or expanding facilities in nonattainment areas are required to install specific technologies regardless of cost, and projects cannot move forward unless ozone is reduced from other sources. These “offsets” are neither cheap nor easy to obtain. Currently, offset prices in the Houston-Galveston-Brazoria Non-Attainment area are close to \$175,000 per ton of NO<sub>x</sub> and \$275,000 per ton of VOC. Offset prices in southern California nonattainment areas are approaching \$125,000 per ton of NO<sub>x</sub>. Rural areas, which could become new nonattainment areas under a tighter standard, may lack offsets altogether, making the offset requirement a total barrier to new projects.

Even manufacturers not looking to expand will be subject to restrictive new regulations in nonattainment areas. For instance, in the Houston non-attainment area, existing facilities are subject to additional controls under the Highly Reactive VOC (HRVOC) rule, and combustion units, such as boilers and ethylene crackers, must install SCRs and low-NO<sub>x</sub> burners. In the most severe cases, states with nonattainment areas could lose federal highway and transit funding.

### **Why Would New Ozone Regulations Be So Expensive?**

Thankfully, the EPA did not propose a standard of 60 ppb. Instead, the Administrator has proposed a narrower range, between 65 and 70 ppb.

Nevertheless, the NAM/NERA report is instructive not only because of the top-line economic numbers but also because of NERA's careful investigation into why this regulation is so expensive.

Attaining a tighter ozone standard will require large reductions in NO<sub>x</sub> and VOC emissions from power plants, manufacturing facilities and mobile sources, such as cars, trucks and off-road vehicles. These reductions come at a high cost per ton because significant investments have already been made to reduce emissions, leaving few low-cost control options as the ozone standard tightens.

EPA has identified a suite of "known controls" for power plants, manufacturers, commercial and residential consumers, and onroad and off-road vehicles. These technologies are all expensive. However, application of all existing known controls will still fall short of attainment of an ozone standard set at 60, 65 or even 70 ppb. The remaining reductions will have to be met with what EPA calls "unknown controls." These are exactly as they appear: EPA cannot identify what the controls are.

In 2011, the EPA identified only one-third of the controls needed to reduce the 3.9 million tons of NO<sub>x</sub> to achieve a 60 ppb ozone standard. When EPA modeled the cost of these unknown controls, it drew a cost curve with little evidence behind it, but still wound up at a cost per ton 19 times higher for unknown controls than for known controls. NERA's model assumed the same costs per ton as EPA for known controls, but differed sharply on the cost of unknown controls. NERA concluded that removal of the 2.6 million tons of NO<sub>x</sub> covered by "unknown controls" would necessarily require some power plants,

manufacturing facilities and vehicles, along with other industrial, commercial, agricultural and even residential equipment, to have to be shut down or scrapped. The reductions needed to attain 60 ppb were so aggressive that few industries or sectors were spared.

NERA performed an evidence-based approach to draw its cost curve for unknown controls. NERA used information on the cost per ton to reduce NO<sub>x</sub> from existing literature—specifically, studies done on the retirement of coal-fired power plants and an analysis done by Dr. Christopher Knittel of Massachusetts Institute of Technology on the “cash for clunkers” automobile program<sup>14</sup>—and developed a more informed curve of the potential costs of unknown controls.

Unfortunately, the EPA’s latest proposed ozone rule suffers from many of the same cost and feasibility challenges identified by NERA in the 2011 proposal. Manufacturers will again need to rely on unknown controls—as much as 40 percent of the NO<sub>x</sub> reductions under a standard of 65 ppb—yet EPA has somehow assumed that these unknown controls will be *less* expensive per ton than some of the known controls. In addition, the EPA modeled only attainment in 2025, but nonattainment designations will be made as early as 2017, meaning EPA’s cost projections do not take into account any of the costs for areas that go from nonattainment to attainment between 2017 and 2025. The EPA only projected costs for areas with emissions monitors, which excludes roughly 76 percent of U.S. counties. EPA assumes costs will be lower due to NO<sub>x</sub> reductions

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<sup>14</sup> Knittel, Christopher. 2009. “The Implied Cost of Carbon Dioxide under the Cash for Clunkers Program.” Center for the Study of Energy Markets, UC Berkeley. *Article available at <http://www.ucei.berkeley.edu/PDF/csemwp189.pdf>; spreadsheet available at <http://web.mit.edu/knittel/www/papers/CfC.xls>.*

from the Clean Power Plan, a rule that has not gone final and may not in its current form. And, as in 2011, the EPA excluded California from its base economic analysis.

When NERA identified and corrected these modeling deficiencies in its study of a 60 ppb standard, the annual cost of the rule more than doubled, from an estimated present value of \$900 billion from 2017-2014 (EPA) to \$2.2 trillion over the same time period (NERA). Given that many of these modeling deficiencies are present in the current proposal, it is reasonable to assume that the EPA has underestimated the regulation's cost.

### **Implementation of the Current Standard Has Barely Begun**

Even though the current standard was finalized in 2008, the EPA stopped implementing it from 2010-2012 while it pondered an out-of-cycle rulemaking to make it more stringent. EPA did not restart implementation until early 2012, six months after the White House rejected EPA's more stringent ozone standard.

EPA's delay put state implementation of the 2008 ozone standard well behind the normal schedule. States did not find out which of their counties would be designated nonattainment under the 2008 standard until April 2012. The implementing regulations from the 2008 standard are still logged at the Office of Management and Budget, and have not been released to states so that they can submit their State Implementation Plans (SIPs).

States are committing time and money to meet the 2008 ozone standard. Yet EPA now wants to move the goal posts in the middle of the game, straining

the limited state resources for implementation and not giving states a chance to meet the current NAAQS.

### **EPA's Proposed Standard is Approaching Background Ozone Levels**

The chemistry and formation of ozone is complex. Ozone is formed at ground-level due to chemical interactions involving solar radiation and VOCs, NO<sub>x</sub>, methane (CH<sub>4</sub>) and carbon monoxide (CO). Precursor emissions leading to ozone formation result from man-made sources like power plants, factories and cars, but also natural sources like forest fires and plant life. Additionally, ozone from the stratosphere that protects us from ultraviolet rays can migrate to ground-level.<sup>15</sup> Ozone can be transported hundreds or even thousands of miles by wind across both state and national borders. As EPA notes in its proposed rule, “some locations in the U.S. can be substantially influenced by sources that may not be suited to domestic control measures. In particular, certain high-elevation sites in the western U.S. are impacted by a combination of non-local sources like international transport, stratospheric O<sub>3</sub>, and O<sub>3</sub> originating from wildfire emissions.”<sup>16</sup> EPA also notes that analysis suggests that in some parts of the country and at certain times, background concentrations of ozone approach or even exceed the current 75 ppb standard.<sup>17</sup> EPA's proposal is so stringent that the Grand Canyon would fail the proposed 70 ppb standard, and Yellowstone National Park would fail the proposed 65 ppb standard. The National Oceanic and Atmospheric Administration (NOAA) released a study showing that Las

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<sup>15</sup> EPA Proposed Rule, National Ambient Air Quality Standards for Ozone, Pre-Publication, p. 32 (2014).

<sup>16</sup> EPA Proposed Rule, p. 33 (2014).

<sup>17</sup> EPA Proposed Rule, p. 33 (2014).

Vegas would exceed EPA's proposed range of ozone NAAQS almost entirely due to background ozone.

Further, the relationship between precursor emissions, which ultimately are the target of regulation from NAAQS policies, and ozone formation are nonlinear. As EPA notes in the proposed rule, "In some areas, such as urban centers where NO<sub>x</sub> emissions typically are high, NO<sub>x</sub> leads to the net destruction of O<sub>3</sub>, making O<sub>3</sub> levels lower in the immediate vicinity."<sup>18</sup> The inverse has also been demonstrated, as NO<sub>x</sub> emissions are reduced in some areas, ozone levels actually increase.

## **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. 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. There must be a balance.

The EPA's proposed new ozone NAAQS fails to achieve this balance. This proposal is likely to be the most expensive regulation ever, and comes at a time when manufacturers are busy complying with dozens of other new regulations that will drive major reductions in ozone. At some point the constant threat of billions of dollars of capital expenditures driven by new regulations will shut down our nation's job creators. Manufacturers are on the verge of a major comeback—they just need some balance from Washington.

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<sup>18</sup> EPA Proposed Rule, p. 33 (2014)