

**Statement of Robert L. Glicksman
to the House Energy and Commerce Committee's
Subcommittee on Commerce, Manufacturing and Trade and
Subcommittee on Energy and Power**

**Hearing on "EPA's Proposed Ozone Rule: Potential Impacts on Manufacturing"
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Chairman Burgess, Chairman Whitfield, Ranking Member Schakowsky, Ranking Member Rush, and members of the subcommittees, I appreciate the opportunity to testify today on why strong standards to reduce ozone air pollution are both necessary to fulfill the Clean Air Act's congressionally-mandated public health goals and consistent with a strong economy in which manufacturers can prosper and thrive.

My name is Robert L. Glicksman. I am the J.B. & Maurice C. Shapiro Professor of Environmental Law at The George Washington University Law School. I am also a member scholar at the Center for Progressive Reform (CPR). I graduated from the Cornell Law School and have practiced and taught environmental and administrative law for more than 35 years.

My testimony makes four key points:

1. A strong national ozone pollution standard that fulfills the public health goals of the Clean Air act will deliver significant benefits for human health and the environment.
2. Regulations, such as the Environmental Protection Agency's (EPA) pending ozone standard, can and do provide important economic benefits for U.S. businesses, including those in the manufacturing sector.
3. A frequently cited study purporting to find catastrophic economic effects from a strong ozone standard is flawed and fails to provide a reliable accounting of the rule's potential impacts.
4. To the contrary, the available evidence confirms that strong national standards for ozone pollution are not an impediment to economic growth.

I. STRONG NATIONAL OZONE POLLUTION STANDARDS HAVE ALREADY DELIVERED SIGNIFICANT PUBLIC HEALTH AND ENVIRONMENTAL BENEFITS, AND MORE PROTECTIVE STANDARDS WOULD BENEFIT THE PUBLIC EVEN MORE

Clean Air Act regulations to limit dangerous ground-level ozone pollution rank among this country's most successful environmental policies. These rules help prevent around 4,300 premature deaths, 86,000 emergency room visits, and 3.2 million lost school days every year.¹ EPA estimates that by 2020 these rules will deliver even greater benefits, helping prevent as many as 7,000 premature deaths, 120,000 emergency room visits, and 5.4 million lost school days every year. The health benefits of reducing ozone pollution are numerous. For example, The National Research Council concluded that short-term exposure to low levels of ground-level ozone can impair lung function and contribute to heart disease, resulting in increased illnesses, hospitalization, and even death.² Ozone pollution affects people of all ages. Recent studies show that a mother's smog exposure also may reduce the size of her newborn infants.³ One study concluded that exposure of healthy young adults to 0.06 ppm ozone (a lower concentration than the current ozone standard allows) for 6.6 hours causes significant pulmonary function and airway inflammation.⁴ Older people and people living in cities without air conditioning seem to be at particular risk.⁵

Ozone pollution-control rules have also strengthened the U.S. economy by promoting the health of the agriculture and forestry sectors. EPA estimates that in 2010 the rules prevented

¹ U.S. ENVTL. PROTECTION AGENCY, OFF. AIR & RADIATION, THE BENEFITS AND COSTS OF THE CLEAN AIR ACT FROM 1990 TO 2020: SUMMARY REPORT 14 (2011), available at <http://www.epa.gov/cleanairactbenefits/feb11/summaryreport.pdf>.

² COMMITTEE ON ESTIMATING MORTALITY RISK REDUCTION BENEFITS FROM DECREASING TROPOSPHERIC OZONE EXPOSURE, NATIONAL RESEARCH COUNCIL, ESTIMATING MORTALITY RISK REDUCTION AND ECONOMIC BENEFITS FROM CONTROLLING OZONE AIR POLLUTION (2008).

³ See Rich et al., *Differences in Birth Weight Associated with the 2008 Beijing Olympic Air Pollution Reduction: Results from a Natural Experiment*, ENVTL. HEALTH PERSPECTIVES, DOI:10.1289/ehp.140879 (2015).

⁴ Kim et al., *Lung Function and Inflammatory Responses in Healthy Young Adults Exposed to 0.06 ppm Ozone for 6.6 Hours*, 183 AM. J RESPIRATORY & CRITICAL CARE MED. 1215 (May 1, 2011).

⁵ See, e.g., Bell et al., *A Meta-Analysis of Time-Series Studies of Ozone and Mortality with Comparison to the National Morbidity, Mortality, and Air Pollution Study*, 16 EPIDEMIOLOGY 436 (2005).

\$5.5 billion worth of crops and forest products being lost to ozone-related damage; by 2020, EPA predicts that they will annually prevent losses of crops and forest products worth \$10.7 billion. The ozone standards also reduce the damage to rubber, textiles, and paints that result from ozone pollution. Because exposure to even low levels of ozone pollution can trigger asthma attacks and aggravate lung diseases such as bronchitis, ozone pollution also results in missed work and school days, impairing the productivity of America's current and future work forces.

But more can and should be done. According to the American Lung Association, nearly half of all Americans—more than 140 million people in all—continue to live in areas with harmful levels of ozone pollution.⁶ A 2011 analysis by the Natural Resources Defense Council found that U.S. communities had issued more than 2,000 Code Orange and Code Red ozone alerts in just the first seven months of that year alone.⁷ The poor and racial minorities are disproportionately harmed since the highest pollution levels are typically found in urban and economically distressed communities. For example, a 2012 study by the Connecticut Department of Public Health found that asthma-related hospitalization rates were roughly twice as high for the state's most urban areas as compared to their neighboring suburbs, which the report in part attributes to disparities in relative air quality.⁸ Rising temperatures brought about by global climate disruption threaten to make matters even worse. In a recent study, the National

⁶ Am. Lung Ass'n, *State of the Air 2014*, <http://www.stateoftheair.org/2014/key-findings/ozone-pollution.html> (last visited Oct. 31, 2014).

⁷ Elizabeth Weise, *Report Details 2,000 Unhealthy Air Alerts in 2011*, USA TODAY, Aug. 11, 2011, available at <http://usatoday30.usatoday.com/weather/news/extremes/story/2011/08/Report-details-2000-unhealthy-air-alerts-in-2011/49920218/1>.

⁸ AVA NEPAUL ET AL., *THE BURDEN OF ASTHMA IN CONNECTICUT: 2012 SURVEILLANCE REPORT 53* (Conn. Dept. Public Health, 2012), available at http://www.ct.gov/dph/lib/dph/hems/asthma/pdf/full_report_with_cover.pdf.

Center for Atmospheric Research projects that climate disruption-related impacts could cause the number of unhealthy ozone pollution level days to increase 70 percent by 2050.⁹

To further protect people and the environment, EPA is working on a rulemaking that would strengthen the ozone National Ambient Air Quality Standard (NAAQS). The Clean Air Act was adopted in 1970 with overwhelming bipartisan support and was signed by President Richard Nixon. It was strengthened in 1990, with the support of President George H.W. Bush. The Act requires EPA to adopt national ambient air quality standards that sets maximum allowable outdoor concentrations of common air pollutants, called criteria pollutants. These pollutants are ones whose emissions cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare and whose presence in the air results from numerous sources. Ground-level ozone is one of those pollutants. The statute requires EPA to set the standards at levels that are sufficient to protect the public health, with an adequate margin of safety, and the public welfare, which includes effects on property and economic values. In other words, the standards represent levels of air pollution that are safe to breathe. And Congress, in adopting the statute, explicitly recognized that air pollution is capable of adversely affecting economic values as well as public health, and mandated that EPA take steps to reduce those effects.

In the 45 years since Congress passed the Clean Air Act, industry has repeatedly argued in the courts that EPA must consider the cost of controlling pollution under the national ambient air quality standards. The courts have consistently and resoundingly rejected that contention, most recently in a unanimous Supreme Court opinion written by Justice Antonin Scalia.¹⁰ The

⁹ *Climate Change Threats to Worsen U.S. Ozone Pollution*, Nat'l Ctr. Atmospheric Res./Univ. Corp. Atmospheric Res. ATMOSNEWS, <https://www2.ucar.edu/atmosnews/news/11540/climate-change-threatens-worsen-us-ozone-pollution> (last visited Oct. 31, 2014).

¹⁰ *Whitman v. American Trucking Ass'ns, Inc.*, 531 U.S. 457 (2001).

Court ruled in that case that the Clean Air Act *prohibits* EPA from considering cost when it adopts the national ambient air quality standards. These rulings do not mean that compliance costs and economic impact are irrelevant to the Clean Air Act's operation. Instead, the courts have recognized that Congress established a regulatory program in which the states take cost into account in designing and implementing plans to achieve the national air quality standards. The statute gives the states broad discretion to adopt strategies for achieving the standards that meet their economic and social needs.

The Clean Air Act requires EPA to review the national ambient air quality standards for every criteria pollutant, including the one for ozone, at least once every five years. In doing so, EPA must solicit the input of an independent scientific review committee called the Clean Air Science Advisory Committee (CASAC), which was formed to advise the EPA on scientific matters related to its clean air regulations. The purpose of this periodic review process is to determine whether current science shows that the existing standards are consistent with achieving the statute's public health and welfare goals. If the scientific evidence shows that a standard is not protective enough to achieve those goals, EPA must amend the standards to make them more protective. Scientists have known for a long time that the current national standard for ozone of 75 parts per billion (ppb), which was set in 2008, is far too weak. CASAC has therefore recommended that the standard should be set as low as 60 ppb. EPA has estimated that restricting ozone pollution to this level would annually prevent up to up to 12,000 premature deaths, 5,300 nonfatal heart attacks, 58,000 cases of aggravated asthma, and 2.5 million missed school and work days.¹¹

¹¹ U.S. ENVTL. PROTECTION AGENCY, FACT SHEET: SUPPLEMENT TO THE REGULATORY IMPACT ANALYSIS FOR OZONE (2010), available at <http://www.epa.gov/glo/pdfs/fs20100106ria.pdf>.

As it works towards completing its pending rulemaking, EPA should reestablish the ozone standard at a maximum concentration of 60 ppb. This standard is necessary to meet the Clean Air Act's requirement that the ozone NAAQS be set at a level "requisite to protect the public health" with "an adequate margin of safety." CASAC unanimously recommended in June 2014 that the agency revise the NAAQS downward to within the range of 60 to 70 ppb. Based on its review of the most up-to-date science on ozone's harmful health effects, CASAC further advised that EPA set the standard toward the lower end of its recommended range, noting that "the recommended lower bound of 60 ppb would certainly offer more public health protection than levels of 70 ppb or 65 ppb and would provide an adequate margin of safety." In August 2014, EPA staff echoed CASAC's recommendations in its final Policy Assessment report, providing further support for a NAAQS set at 60 ppb. EPA should also follow CASAC's advice in setting a separate "secondary" NAAQS necessary for protecting public welfare.

Unfortunately, in November 2014, the EPA announced that it was proposing to revise the ozone standard to within the range of 65 ppb to 70 ppb. This revision is much weaker than what EPA's advisors had called for, and it appears to be inconsistent with the clear statutory language adopted by Congress and interpreted by a unanimous Supreme Court. The proposal did, however, call for comments on revising the standard down to 60 ppb, a level that is more consistent with the best available science and the clear language of the Clean Air Act.

II. REGULATIONS OFTEN PROVIDE IMPORTANT ECONOMIC BENEFITS FOR BUSINESSES, INCLUDING MANUFACTURERS

The economic benefits of regulation for businesses can be significant, but are all too often overlooked. First and foremost, businesses receive a significant productivity dividend when their workers and their workers' families are healthy and safe. Public health and

environmental regulations in particular have been vital in reducing “lost work” days and “restricted activity” days that can undermine a business’s productivity—and by extension its competitiveness and profitability. For example, EPA estimates that its Clean Air Act regulations prevented 13 million lost work days and 84 million restricted activity days in 2010.

Second, regulations can help to create new markets and opportunities for entrepreneurs. Energy efficiency regulations provide a good example. Energy efficiency standards adopted by the federal government and the states, such as the corporate average fuel economy standards established jointly by EPA and the National Highway Traffic Safety Administration or standards for consumer products, are pushing American companies to develop more energy efficient products at lower costs. As a result, these products are now and will continue to be attractive both domestically and in foreign markets for consumers and businesses that desire to save money on their fuel and electricity bills. Significantly, these standards can help to ensure that American businesses are well-positioned to be the world’s leaders in meeting the growing demand for energy efficient products.

Third, regulations can spur businesses to revolutionize their production processes in ways that lead to greater productivity and profitability. For example, in 1978, OSHA issued the Cotton Dust rule to protect workers from harmful exposures to cotton dust, which can cause byssinosis (or “brown lung” disease). Much like silicosis, brown lung disease is a debilitating and potentially fatal disease that significantly impairs lung function. OSHA later found that, as a result of the Cotton Dust rule, the number of byssinosis cases among textile workers in the country declined from approximately 50,000 in the early 1970s to around 700 in the mid-1980s,

a decline of 99 percent.¹² Significantly, though, the investments that companies covered by the rule made in developing new equipment to comply with the rule also served to increase the industry's productivity and profitability. In a 2000 retrospective review of the rule that OSHA conducted pursuant to the Regulatory Flexibility Act, the agency found that in the years before the rule's full implementation, the industry's productivity rate grew at a rate of roughly 2.5 percent. In the years after, however, the productivity growth rate had increased to 3.5 percent.¹³

Fourth, as recent episodes illustrate, when industrial-scale catastrophe results from a failure to regulate adequately, the attendant costs can be devastating for impacted businesses. Think of all the restaurants and cafés in Charleston, West Virginia that had to close their doors for several days or even weeks following the 2014 spill of MCHM into the Elk River. Or think of all the hotels, charter fisherman, and souvenir shop owners that were devastated by the ongoing fallout from the 2010 Gulf Oil spill. Stronger regulations that are necessary for preventing these catastrophes or for minimizing their harmful consequences would thus deliver particularly large benefits to many businesses that might otherwise be caught in harm's way.

III. INDUSTRY STUDIES ON THE PURPORTED IMPACTS OF THE EPA'S PENDING NATIONAL OZONE AIR POLLUTION STANDARD ARE FLAWED AND THEIR RESULTS ARE UNRELIABLE

Over the last several months, the National Association of Manufacturers (NAM) has released a series of reports that purport to calculate the total economic impacts of EPA's proposed national ozone standard. The most recent study from February 2015 claims to look at what these impacts would be if EPA adopts a NAAQS of 65 ppb—the lower end of its proposed range. It concludes that the rule's compliance costs would reduce the US gross domestic product

¹² OCCUPATIONAL SAFETY & HEALTH ADMIN., OFFICE OF PROGRAM EVALUATION, REGULATORY REVIEW OF OSHA'S COTTON DUST STANDARD ii, 28-33 (2000), *available at* https://www.osha.gov/dea/lookback/cottondust_final2000.pdf.

¹³ *Id.* at 22, 35-38.

by about \$140 billion per year between 2017 and 2040 and result in “an average annual loss in employment income equivalent to 1.4 million jobs.” Opponents of more protective air quality standards have cited these eye-catching numbers repeatedly ever since publication of the studies.

The report suffers from several key flaws, and its results are so unreliable that they detract from rather than promote a meaningful understanding of the proposed ozone rule’s potential impacts. As a threshold matter, the study fails to consider the rule’s public health and environmental benefits. Any policy decision will look bad if only its costs are considered in this kind of one-sided analysis. Ultimately, it is impossible to discern the real value of a policy without considering both costs and benefits in some manner. The failure to provide an assessment of the benefits of a new ozone standard makes the NAS studies inherently incomplete and their results fundamentally misleading.

The NAM study’s methodology also contains several flaws, leading it to significantly overestimate the rule’s potential costs and “job loss” impacts. The vast majority of the study’s cost estimates comes from the faulty approach that the authors employed to estimate the cost of ozone emissions reductions through “non-existing” control methods and technologies. Like EPA, the study starts from the observation that existing technologies are insufficient to achieve a tighter ozone standard. By definition, the costs of developing and implementing new methods and technologies are unknown, so they must be predicted. The NAM’s study took a highly unusual approach to making this prediction: It assumed that the environmental programs that would produce these reductions would look exactly like a non-environmental program known as “Cash for Clunkers.”

The “Cash for Clunkers” program was not designed to reduce ozone pollution; rather it was part of Congress’s 2009 economic stimulus program. But, because it had the effect of

replacing polluting old cars with cleaner new ones it also had the ancillary benefit of reducing ozone and other air pollutants. Few would disagree that, as a pollution control strategy, an approach like the “Cash for Clunkers” program is highly inefficient; the cost-per-ton of pollution reduction is extremely high, particularly compared to other pollution control strategies. That’s why no one ever really thought of it as a pollution control strategy—that is, until NAM published its ozone costs study.

Using “Cash for Clunkers” as its model, the NAM study concludes that the per-ton cost of ozone reduction through “non-existing” technologies would be about \$500,000. By applying this per-ton cost to most of the emissions reductions that would be needed to meet an ozone NAAQS of 65 ppb, the NAM study produced huge total cost estimates.

In reality, of course, meeting a tighter ozone standard would be much cheaper. That is why some observers have characterized the NAM study’s approach to developing this prediction as both “unrealistic,” leading to grossly overstated cost estimates. Laurie Johnson at the Natural Resources Defense Council was able to put the results of NAM’s study in perspective by noting that the EPA’s 2011 Cross-State Air Pollution Rule was estimated to generate reductions of NO_x—an ozone precursor—for as little as \$500 per ton. This per-ton reduction cost is 1,000 times less than the NAM’s per-ton cost estimate.¹⁴ States and sources obviously will seek to comply with obligations stemming from a more protective ozone standard by choosing the least-cost available method of controlling ozone precursors, not the most expensive.

Trying to predict the costs of “non-existing” pollution control methods and technologies is notoriously difficult. One overarching trend, though, is that predicted estimates, especially but

¹⁴ Laurie Johnson, *National Association of Manufacturers: Thin Air*, SWITCHBOARD, Sept. 16, 2014, http://switchboard.nrdc.org/blogs/ljohnson/national_association_of_manufa.html (last visited June 13, 2015).

not exclusively those provided by regulated entities, tend to be overstated.¹⁵ With a dynamic economy, regulated businesses are often able to find cheaper ways to meet new requirements than seemed possible at the time regulatory standards were being considered. Indeed, this result is consistent with well-functioning free markets. Industries adapt to new challenges, including those posed by needed health-protective regulations, and new technologies develop and become more cost-effective as they spread to more and more firms. EPA's NAAQS process seeks to take advantage of the economy's dynamic features, by affording enormous flexibility to the state agencies that implement the actual pollution requirements needed for meeting NAAQS. States are able to take advantage of their unique local circumstances to find the cheapest ways to meet tougher air pollution standards, and the Clean Air Act provides states with lead time before regulatory deadlines kick in, which allows for technological innovation as well as opportunities for adaptation within and across affected industries.

Further undermining the study's findings of high costs is the fact that the vast majority of the country is already on target to meet at least a 70-ppb NAAQS by 2025 by simply implementing pollution control measures that are already on the books or that are under development. As John Walke of the Natural Resources Defense Council points out, if that is the case, then this suggests that the NAM study has likely overestimated the need for "non-existing"

¹⁵ Thomas O. McGarity & Ruth Ruttenberg, *Counting the Cost of Health, Safety, and Environmental Regulation*, 80 TEX. L. REV. 1997, 2011, 2044-50 (2002). Several retrospective studies have found that *ex ante* cost predictions were overestimated. See, e.g., Winston Harrington, Richard D. Morgenstern, & Peter Nelson, *On the Accuracy of Regulatory Cost Estimates* 6 (Resources for the Future, Discussion Paper 99-18, 1999) (citing PUTNAM, HAYES, & BARTLETT, INC., COMPARISON OF ESTIMATED AND ACTUAL POLLUTION CONTROL CAPITAL EXPENDITURES FOR SELECTED INDUSTRIES (Report prepared for the Office of Planning & Evaluation, U.S. Env'tl. Protection Agency, 1980)), available at <http://www.rff.org/documents/RFF-DP-99-18.pdf>.

pollution control methods and technologies to meet the new ozone NAAQS.¹⁶ This, too, would lead the study to greatly exaggerate the rule's likely costs.

Another questionable premise of the NAM study is its assumption that the ozone standard will force one-third of coal-fired electricity generating units to shut down, to be replaced by costly new power plants. Putting aside the questionable nature of the predicted scope of power plant retirements, the fate of coal-fired generating units must be put in perspective. It is inaccurate to attribute all of the replacement of coal-fired electricity production to federal environmental regulation. A primary driver of this trend is the low price of natural gas.

Another major flaw with the NAM ozone study is the methodology it uses to estimate the rule's so-called negative employments. Critically, the study does not necessarily find that a tighter ozone NAAQS would result in significant job losses. Rather, the study finds that a more protective ozone standard would result in slight income reductions for U.S. workers. Spread out across the more than 100 million people employed in the United States, the study thus finds that the ozone rule would produce a huge total loss in income. It then attempts to equate this lost income with job losses, by dividing the total income loss by the average wage among U.S. workers. This is why the study's results are stated as lost "employment income equivalent." In reality, it is unclear what impact a more protective ozone standard would have on jobs and individual wages.

IV. THE AVAILABLE EVIDENCE CONFIRMS THAT STRONG OZONE STANDARDS AND A STRONG ECONOMY GO HAND IN HAND

Regulatory opponents contend that environmental, health, safety, and other regulations slow economic growth and contribute to job losses. But, as with any type of spending,

¹⁶ John Walke, *Industry Opponents of Safer Air Knows It's Coming; They Just Want to Deny You That Right*, SWITCHBOARD, Apr. 28, 2015, http://switchboard.nrdc.org/blogs/jwalke/the_national_association_of_ma.html (last visited June 13, 2015).

regulatory compliance generates economic activity. While it is often difficult to measure whether on balance job gains from this spending offset any job losses, existing studies do not support the conclusion that regulation retards job growth. Instead, the studies find either no overall impact or, in some cases, an actual increase in employment.¹⁷ This finding should not be surprising. After all, money spent on regulation contributes to the economy, because firms must buy equipment and labor services in order to comply with regulation.

Most of the evidence concerning the impact of regulation on employment comes from studies of environmental regulation. Table 1 summarizes the findings of the key studies:

Source	Segment of Economy Affected by Environmental Regulation	Net Impact on Employment
Bezdek, et.al. (2008) ¹⁸	Entire economy	<ul style="list-style-type: none"> • Increase
Morgenstern, et.al. (2000) ¹⁹	Four polluting industries	<ul style="list-style-type: none"> • Increase in petroleum and plastics • No statistically significant impact in pulp and paper and steel
Berman & Bui(2001) ²⁰	Los Angeles area (Clean Air Act)	<ul style="list-style-type: none"> • No evidence of decrease • Probable slight increase
Goodstein (1999) ²¹	Entire economy	<ul style="list-style-type: none"> • 7 of 9 available studies found increase • 1 study found decrease • 1 study found mixed results

Table 1: Impact of Environmental Regulation on Employment

¹⁷ See Isaac Shapiro & John Irons, *Regulation, Employment & and the Economy: Fears of Job Loss Are Overblown* (Env'tl. Pol'y Inst., Briefing Paper No. 305, 2011) (summarizing the evidence), available at http://epi.3cdn.net/961032cb78e895dfd5_k6m6bh42p.pdf; Frank Ackerman & Rachel Massey, *Prospering with Precaution: Employment, Economics, and the Precautionary Principle* (Global Dev. & Env't Inst., Working Paper, 2002) (same), available at <http://www.healthytomorrow.org/attachments/prosper.pdf>.

¹⁸ Roger H. Bezdek, Robert M. Wendling, & Paula Di Perna, *Environmental Protection, the Economy, and Jobs: National and Regional Analyses*, 86 J. ENVTL. MGMT. 63 (2008).

¹⁹ Richard D. Morgenstern, William A. Pizer, & Jhih-Shyang Shih, *Jobs versus the Environment: An Industry-level Perspective* (Resources for the Future, Discussion Paper 99-01-REV, 2000), available at http://www.globalurban.org/Jobs_vs_the_Environment.pdf.

²⁰ Eli Berman & Linda T.M. Bui, *Environmental Regulation and Labor Demand: Evidence from the South Coast Air Basin*, 79 J. PUB. ECON. 265 (2001).

²¹ EBAN GOODSTEIN, THE TRADE-OFF MYTH: FACT AND FICTION ABOUT JOBS AND THE ENVIRONMENT (1999).

In addition to these studies, the Environmental Policy Institute (EPI) found that Department of Labor data suggest that few jobs are lost because of regulation.²² The Bureau of Labor Statistics has developed an “extended mass layoff” data series, which examines the reasons why companies lay off 50 or more workers for more than 30 days. Since 2007, about 1.5 million workers per year have lost their jobs in such layoffs. Significantly, the data series is based on employer-supplied information. According to this information, an average of only 0.3 percent of workers lost their jobs because of government regulations or intervention during the years 2007-2009. This result is similar to data concerning layoffs prior to 2007.²³ As the EPI notes, it is “striking” how few of these layoffs employers attribute to government regulations/intervention.²⁴ (By comparison, the same data find that extreme weather events have caused more extended mass layoffs.²⁵) Moreover, the small number of workers who lost their jobs because of government regulation “pales in comparison to any accounting of the jobs lost in this period due to the regulatory failures that contributed to the economy’s financial crisis.”²⁶

Another alleged impact of regulation is that it drives companies to transfer manufacturing overseas in order to remain competitive in international markets, which causes job losses at home. Economists have attempted to confirm that businesses flee to “pollution havens” to avoid domestic environmental regulation, but it is difficult to isolate this reason for moving manufacturing overseas from other factors, such as the availability of natural resources, new

²² Shapiro & Irons, *supra* note 17, at 20.

²³ *Id.*; see GOODSTEIN, *supra* note 21 at 35-37 (summarizing data from 1970-90 and finding similarly small numbers of workers being laid off because of environmental regulations).

²⁴ Shapiro & Irons, *supra* note 17, at 20.

²⁵ *Regulations Do Not Hinder U.S. Job Market, Paper Finds*, OMB WATCH, <http://www.ombwatch.org/node/11615> (last visited June 1, 2011).

²⁶ Shapiro & Irons, *supra* note 17, at 20.

markets, and the supply and cost of local employees. The studies summarized in Table 2 indicate what economists have found:

Source	Environmental Regulation and Competitiveness
Jaffee, et.al (1995) ²⁷	Relatively little evidence of negative impact
Brunnermeier & Levinson (2004) ²⁸	Studies find some negative impacts
Pasurka (2008) ²⁹	Studies split concerning negative impact
Hanna (2010) ³⁰	Small negative impact

Table 2: Impact of Environmental Regulation on Competitiveness of Domestic Firms

The evidence about outsourcing due to regulation is mixed at best, and it does not suggest that regulation causes a large shift of manufacturing jobs to overseas firms.³¹ Moreover, the compliance costs to regulated companies cannot be viewed in isolation. Firms in the United States, for example, spend about the same amount of money on environmental regulation as do the countries of the Organization for Economic Cooperation and Development (OECD).³² While the cost of regulation may be less in China or India, few Americans would want to live with the appalling air and water pollution present in those two countries. Finally, regulation can increase competitiveness, rather than decrease it. There is considerable evidence that as firms innovate in response to regulatory requirements, they become stronger international competitors because of innovation.³³

²⁷ Adam B. Jaffe et al., *Environmental Regulation and the Competitiveness of U.S. Manufacturing: What Does the Evidence Tell Us?*, 33 J. ECON. LITERATURE 157 (1995).

²⁸ Smita B. Brunnermeier & Arik Levinson, *Examining the Evidence on Environmental Regulations and Industry Location*, 13 J. ENV'T. & DEV. 6 (2004).

²⁹ Carl Pasurka, *Perspectives on Pollution Abatement and Competitiveness: Theory, Data, and Analyses*, 2 REV. ENVTL. ECON. & POL'Y 194 (2008).

³⁰ Rema Hanna, *U.S. Environmental Regulation and FDI: Evidence from a Panel of U.S.-Based Multinational Firms*, 2 AM. ECON. J.: APPLIED ECON. 158 (2010) (finding regulation has caused 5.3 percent increase in foreign assets).

³¹ Shapiro & Irons, *supra* note 17, at 19.

³² *Id.*; Pasurka, *supra* note 29, at 207 (finding the difference between the U.S. and other OECD countries in terms of spending on environmental protection “largely disappeared by the 1990s”).

³³ See, e.g., Michael Porter, Hans Landsberg Memorial Lecture (Jan. 19, 2011), at 11-12 (noting many examples of where, despite very strict standards and regulations in a particular country in a particular field, the country was competitive in that field), available at <http://www.rff.org/Events/Documents/110119.pdf>.

These broader results are consistent with evidence on the economic impacts of strong national ozone air pollution standards. For example, opponents of strong ozone protections claim that areas of the country that are determined to be out of compliance with the applicable ozone standard—known as “nonattainment areas”—are incapable of sustaining economic growth. They claim that the costly measures these areas must undertake to meet the standards effectively prevent businesses from engaging in many kinds of economic activities. As John Walke at the Natural Resources Defense Council points out, though, seven of the ten fastest growing state economies have ozone nonattainment areas within their borders.³⁴ Clearly, the existence of these areas did not serve as insurmountable obstacle to continued economic achievement.

The long-term trends also confirm the finding that combatting air pollution is consistent with a strong economy. As John Walke and others have observed, EPA’s ozone standards have succeeded in reducing the country’s ozone pollution levels by 70 percent since 1970. During that time, the U.S. economy has grown by over 240 percent.³⁵

Thank you. I’d be pleased to answer any questions you might have.

³⁴ John Walke, *Industry Lobbyists' Latest Whoppers Fighting Safe Air For Americans*, SWITCHBOARD, June 5, 2015, http://switchboard.nrdc.org/blogs/jwalke/industry_lobbyists_latest_whop.html (last visited June 13, 2015).

³⁵ *Id.*