

US EPA ARCHIVE DOCUMENT

**Opening Statement of Regina McCarthy
Assistant Administrator for Air and Radiation
U.S. Environmental Protection Agency**

**Hearing on EPA Regulation of Greenhouse Gases
Subcommittee on Energy and Power
Committee on Energy and Commerce
U.S. House of Representatives
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Chairman Whitfield, Ranking Member Rush and other members of the Committee: Thank you for the opportunity to update you on the Environmental Protection Agency's efforts to reduce carbon pollution, which causes climate change and thereby poses a threat to the health and welfare of the American people.

The Supreme Court held in 2007 that carbon dioxide and other greenhouse gases are covered by the Clean Air Act's broad definition of air pollutants. The Court said that EPA must decide whether greenhouse gases endanger public health or welfare, and whether emissions from new motor vehicles contribute to this air pollution. After considering the extensive scientific evidence, EPA issued endangerment and contribution findings in December 2009.¹ Since then, EPA has taken a deliberative and common sense approach to limiting carbon pollution – using Clean Air Act tools to focus on the largest emitters first and to achieve cost-effective reductions.

On June 26, the U.S. Court of Appeals for the D.C. Circuit upheld EPA's endangerment finding, its greenhouse gas emission standards for light duty vehicles and its Tailoring Rule, which, as explained below, establishes a phased approach for applying certain Clean Air Act permitting requirements to stationary sources based on greenhouse gas emissions – focusing on large sources.² The Court confirmed that EPA followed both the science and the law in these actions. In upholding the endangerment finding, the Court stated: "The body of scientific evidence marshaled by EPA in support of the Endangerment Finding is substantial."³ The court also confirmed that the Clean Air Act required EPA to regulate greenhouse gas emissions from cars and light trucks,⁴ and that

¹ In *Massachusetts v. EPA*, 549 U.S. 497 (2007), the court also explained that EPA was required to regulate motor vehicles if we found that their emissions contributed to the endangerment.

² *Coalition for Responsible Regulation, Inc. et al. v. EPA*, No. 09-1322 (CA DC 2012).

³ *Id.* at 28.

⁴ *Id.* at 39-45.

the Act “unambiguously” requires application of relevant stationary source permitting programs to greenhouse gases.⁵ Finally, the court ruled that the litigants in the case are not harmed by EPA’s Tailoring Rule –which establishes a phased approach to stationary source permitting for greenhouse gases –and therefore lack standing to challenge it.⁶

EPA’s actions to address greenhouse gas pollution are not only consistent with the science and the law; they are also good policy. For example, our vehicle greenhouse gas rules, together with the National Highway and Traffic Safety Administration’s (NHTSA) fuel economy standards, will significantly reduce our dependence on oil and save money for consumers and businesses. At President Obama’s direction, EPA and NHTSA have worked together to establish greenhouse gas and fuel economy standards for model year 2012-2016 passenger vehicles, and proposed standards for model years 2017-2025, that will drive production of a new generation of cleaner, more efficient vehicles. Taking these two programs together, along with NHTSA’s 2011 CAFÉ standards, over the life of the 2011-2025 vehicles-, the standards will save an estimated \$1.7 trillion for consumers and businesses and cut America’s oil consumption by 12 billion barrels, while reducing greenhouse gas emissions by 6 billion metric tons. Importantly, many auto manufacturers have publicly expressed their support for the new standards.

Our experience during more than 40 years of Clean Air Act implementation is that pollution reduction and a healthy economy can go hand in hand. “When we put in place new common-sense rules to reduce air pollution,” President Obama said in January, “we create jobs building and installing all sorts of pollution control technology.”⁷ In combination with other policies, adopting limits on carbon pollution can help to promote a gradual transition to a cleaner and more efficient energy future. As President Obama said last year, “The countries that lead the 21st century clean energy economy will be the countries that lead the 21st century global economy.”⁸

⁵ *Id.* at 59; *see generally id.* at 51-73.

⁶ *Id.* at 73-81.

⁷ Remarks by the President to EPA staff, Andrew W. Mellon Auditorium, Washington, D.C., January 10, 2012.

⁸ Remarks by the President on America’s Energy Security, Georgetown University, Washington, D.C., March 30, 2011.

The need to reduce carbon pollution

Reducing carbon dioxide and other greenhouse gas pollution is not only required by the Clean Air Act – it is critically important to the protection of Americans’ public health and the environment upon which we depend. In May 2010, the National Research Council, the operating arm of the National Academy of Sciences, published an assessment which concluded that “climate change is occurring, is caused largely by human activities, and poses significant risks for – and in many cases is already affecting – a broad range of human and natural systems.”⁹ The NRC stated that this conclusion is based on findings that are “consistent with the conclusions of recent assessments by the U.S. Global Change Research Program, the Intergovernmental Panel on Climate Change’s Fourth Assessment Report, and other assessments of the state of scientific knowledge on climate change.”¹⁰ We note that these are the same assessments that served as the primary scientific underpinning for our 2009 endangerment finding, which was upheld by the D.C. Circuit in its recent decision. In a report issued last year, the NRC emphasized: “Each additional ton of greenhouse gases emitted commits us to further [climate] change and greater risks. In the judgment of the [NRC] Committee on America’s Climate Choices, the environmental, economic, and humanitarian risks of climate change indicate a pressing need for substantial action to limit the magnitude of climate change and to prepare to adapt to its impacts.”¹¹

The risks to public health and the environment from climate change are substantial and far-reaching. Carbon pollution is leading to more frequent and intense heat waves that increase mortality, especially among the poor and elderly.¹² Scientists also expect increasing carbon pollution and resulting climate changes to lead compared to

⁹ National Research Council, *Advancing the Science of Climate Change*, National Academy Press, Washington, D.C., p. 3.

¹⁰ National Research Council, *Advancing the Science of Climate Change*, National Academy Press, Washington, D.C., p. 286.

¹¹ National Research Council (2011) *America’s Climate Choices*, Committee on America’s Climate Choices, Board on Atmospheric Sciences and Climate, Division on Earth and Life Studies, The National Academies Press, Washington, D.C.

¹² USGCRP (2009). *Global Climate Change Impacts in the United States*. Karl, T.R., J.M. Melillo, and T.C. Peterson (eds.). United States Global Change Research Program. Cambridge University Press, New York, NY, USA.

a future without climate change to increased ozone pollution over broad areas of the country, including large population areas with unhealthy ozone levels.¹³ Ground-level ozone can increase the frequency of asthma attacks, cause shortness of breath, aggravate lung diseases such as emphysema and chronic bronchitis, and permanently damage the airways through long-term exposure. Elevated ozone levels are linked to increases in emergency room visits, hospitalizations, and premature death.¹⁴

Scientists warn that carbon pollution and resulting climate change are expected to lead to more intense hurricanes and storms, heavier and more frequent flooding, increased drought, and more severe wildfires – events that can cause deaths, injuries, and billions of dollars of damage to property and the nation's infrastructure. Some of these impacts already have been observed.

There is some evidence that changes in temperature, precipitation patterns and extreme events can enhance the spread of some waterborne and pest-related diseases. For example, warmer temperatures can affect the potential ranges of diseases transmitted by ticks and mosquitoes, such as Lyme disease and West Nile Virus.¹⁵ Increased temperatures and longer growing seasons can also increase production or dispersion of airborne allergens such as ragweed, affecting the prevalence and severity of allergy symptoms.¹⁶

Other damaging and costly effects of carbon pollution and associated climate change noted in the scientific literature include ocean acidification, sea level rise and increased storm surge, harm to agriculture and forests, species extinctions and ecosystem

¹³ CCSP (2008). *Analyses of the effects of global change on human health and welfare and human systems*. A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research. Gamble, J.L. (ed.), K.L. Ebi, F.G. Sussman, T.J. Wilbanks, (Authors). U.S. Environmental Protection Agency, Washington, DC, USA.

¹⁴ U.S. EPA. Air Quality Criteria for Ozone and Related Photochemical Oxidants (2006 Final). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-05/004aF-cF, 2006. Available: <http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=149923#Download>. U.S. EPA. Integrated Science Assessment of Ozone and Related Photochemical Oxidants (Third External Review Draft). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/076C, 2012. Available: <http://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=242490#Download>.

¹⁵ Confalonieri, U., B. Menne, R. Akhtar, K.L. Ebi, M. Hauengue, R.S. Kovats, B. Revich and A. Woodward (2007). *Human health*. In: *Climate Change 2007: Impacts, Adaptation and Vulnerability*. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change Parry, M.L., O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, (eds.), Cambridge University Press, Cambridge, United Kingdom.

¹⁶ Ibid.

damage.¹⁷ Climate change impacts in certain regions of the world (potentially leading, for example, to food scarcity, conflicts or mass migration) may exacerbate problems that raise humanitarian, trade and national security issues for the United States.¹⁸

Those most vulnerable to climate related health effects – such as children, the elderly, the poor, and future generations – face disproportionate risks.¹⁹

In upholding EPA’s endangerment finding, the U.S. Court of Appeals for the D.C. Circuit found a strong record basis for EPA’s determination: “EPA had before it substantial record evidence that anthropogenic emissions of greenhouse gases ‘very likely’ caused warming of the climate over the last several decades. EPA further had evidence of current and future effects of this warming on public health and welfare. Relying again upon substantial scientific evidence, EPA determined that anthropogenically induced climate change threatens both public health and public welfare.”²⁰

The National Research Council and other scientific bodies have emphasized that it is important to take initial steps to reduce greenhouse gases without delay because, once emitted, greenhouse gases persist in the atmosphere for long time periods. As the NRC explained in a recent report, “The sooner that serious efforts to reduce greenhouse gas emissions proceed, the lower the risks posed by climate change, and the less pressure there will be to make larger, more rapid, and potentially more expensive reductions later.”²¹

¹⁷ An explanation of observed and projected climate change and its associated impacts on health, society, and the environment is included in the EPA’s Endangerment Finding and associated technical support document (TSD). See EPA, “Endangerment and Cause or Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act,” 74 FR 66496, Dec. 15, 2009. Both the Federal Register Notice and the Technical Support Document (TSD) for Endangerment and Cause or Contribute Findings are found in the public docket, Docket No. EPA–OAR–2009–0171 and at <http://epa.gov/climatechange/endangerment.html>.

¹⁸ *Endangerment Finding*, 74 FR 66535.

¹⁹ *Endangerment Finding*, 74 FR 66498.

²⁰ *Coalition for Responsible Regulation, Inc. v. EPA*, No. 09-1322 (CADC 2012), at 30.

²¹ National Research Council (2011) *America’s Climate Choices: Report in Brief*, Committee on America’s Climate Choices, Board on Atmospheric Sciences and Climate, Division on Earth and Life Studies, The National Academies Press, Washington, D.C., p. 2.

Reducing carbon pollution from vehicles

EPA's efforts to reduce greenhouse gas emissions have begun with motor vehicles. Transportation sources are responsible for more than a quarter of U.S. greenhouse gas emissions, and motor vehicles are the sources that were at issue in the Supreme Court's *Massachusetts v. EPA* decision.²² EPA's vehicle rules, in conjunction with NHTSA's, will save consumers money and help reduce our dependence on oil. In addition, EPA's renewable fuel standard program reduces oil consumption, helps strengthen rural economies and has the potential to achieve significant reductions in carbon pollution.

In 2010, EPA and the NHTSA finalized a national program setting standards to cut greenhouse gas emissions and increase fuel economy of cars and light trucks for model years 2012-2016. Consistent with the auto industry's recommendation to extend the national program beyond 2016 to support the industry's ability to do long-range planning,²³ the two agencies developed and, in November 2011, proposed additional standards for model years 2017 through 2025. These programs, based on intensive consultation between the federal agencies, auto makers, the State of California, and other stakeholders, provide substantial benefits that far outweigh their costs.

By 2025, the proposal calls for vehicle manufacturers to meet a CO₂ standard projected to be equivalent to 54.5 miles per gallon on an average fleet-wide basis, if the standard were met through fuel economy improvements alone. The agencies identified wide-ranging opportunities for reducing greenhouse gas emissions and improving fuel economy, and the proposals allow for long-term planning by manufacturers and suppliers to continue development and deployment of fuel-saving and emissions-reducing technologies. The program provides compliance flexibility to manufacturers through a credit banking and trading system to reduce the overall cost of the program, and to provide incentives for market penetration of the most advanced vehicle technologies.

²² EPA, (April 2012) Inventory of U.S. Greenhouse Gas Emission and Sinks: 1990-2010 (transportation sources accounted for 27 percent in 2010).

²³ Dave McCurdy, President and CEO, Automobile Alliance, April 1, 2010 press release. Also, included in November, 2009 comments on the 2012-2016 rule by several auto manufacturers.

As mentioned earlier, these model year 2012-2025 standards will result in substantial oil savings and greenhouse gas reductions. The standards will reduce demand for oil by 2.2 million barrels/day by 2025. Consumers, on average, will see fuel cost savings of \$8,000 for a 2025 vehicle (compared to the average 2010 vehicle).

EPA's heavy-duty vehicle standards provide similar types of benefits. In August 2011, EPA and NHTSA issued the first ever greenhouse gas and fuel efficiency standards for trucks and buses. These standards will jointly reduce fuel use and greenhouse gas emissions from medium- and heavy-duty vehicles, which range in size from the largest pickup trucks and vans to semi trucks. EPA and NHTSA developed the program for model years 2014 to 2018 with support from industry, the State of California and environmental stakeholders.

The agencies estimate that the joint heavy-duty truck standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of 2014-2018 vehicles, providing \$49 billion in net program benefits. Owners of model year 2018 trucks will enjoy net savings of \$73,000 over the lifetime of a tractor-trailer, \$6,100 over the life of a heavy-duty pickup, and \$5,500 over the life of a vocational truck. Using technologies commercially available today, EPA estimated that many vehicles will see a payback period of less than one year; others will see payback periods of up to two years. A second phase of regulations is anticipated for model years beyond 2018.

The renewable fuel standard (RFS) program, established by Congress, helps keep money spent on fuel in the United States while reducing greenhouse gas emissions. On March 26, 2010, EPA completed regulations to implement the RFS program mandated by the Energy Independence and Security Act of 2007. This program requires increasing use of renewable fuels over time, including advanced biofuels with significantly lower lifecycle greenhouse gas emissions than conventional fossil fuels. We estimate the RFS program, if fully implemented in 2022, would displace about 13.6 billion gallons of petroleum-based gasoline and diesel fuel, representing about 7 percent of expected annual gasoline and diesel consumption in 2022. We also estimate that the fully implemented program would decrease oil import expenditures by \$41.5 billion dollars, result in

additional energy security benefits of \$2.6 billion, and reduce greenhouse gas emissions by 138 million metric tons of CO₂ equivalent per year.

Providing transparent public information on carbon pollution emissions

In 2008, Congress directed EPA to establish a mandatory reporting system for greenhouse gas emissions. In accordance with this directive, EPA in October 2009 promulgated the Greenhouse Gas Reporting Rule. An estimated 85-90 percent of the total U.S. greenhouse gas emissions from approximately 10,000 facilities are covered by this rule. The rule applies to direct greenhouse gas emitters, fossil fuel suppliers, industrial gas suppliers, and facilities that inject CO₂ underground for sequestration. This rule provides the public for the first time with access to source-by-source data on greenhouse gas emissions in these key sectors. To make these data more accessible and transparent, EPA has also created an online Greenhouse Gas Publication Tool, which allows users to review information quickly and easily by filtering emissions data in a variety of ways, including by facility, industry, location, or gas. These data can be used to identify sources of greenhouse gas emissions, to help businesses to track emissions and find cost-saving efficiencies, to inform policy, and to provide information to the finance and investment communities.,

In January of this year, EPA released the first greenhouse gas data received under the program. The 2010 data include greenhouse gas emissions reports from more than 6,700 entities in 29 categories, providing information on carbon dioxide, methane, nitrous oxide and several types of fluorinated industrial gases. An additional 12 categories begin reporting for the 2011 emissions year.

The data show that for reporting year 2010 power plants were the largest stationary source of direct U.S. greenhouse gas emissions with 2,324 million metric tons of carbon dioxide equivalent (CO₂e), followed by refineries with 183 million metric tons of CO₂e. One hundred facilities each reported emissions over 7 million metric tons of CO₂e -- including ninety-six power plants, two iron and steel mills, and two refineries.

Ensuring best technology for big new emitters

In keeping with the Clean Air Act's requirements, States and EPA on January 2, 2011, initiated Clean Air Act permitting of carbon dioxide and other greenhouse gas pollution from the largest new and modified stationary sources of these emissions. More than a year later, the first "Best Available Control Technology" (BACT) determinations for large stationary source greenhouse gas emissions have been successfully completed, and permits limiting greenhouse gas emissions have been issued for a variety of facilities across the country under the Clean Air Act's Prevention of Significant Deterioration (PSD) program.

The Clean Air Act requires owners and operators of large stationary sources of air pollution, prior to building or modifying such a facility, to obtain construction permits. This permitting requirement is triggered when a facility emits specified levels of pollutants subject to regulation under the Act. Once greenhouse gases became regulated pollutants under the Act, emissions of these pollutants can trigger the requirements of the PSD program for preconstruction permits and best available control technology for greenhouse gas emissions, determined on a source-by-source basis. Greenhouse gas emissions also now trigger Title V requirements for certain new and existing sources to obtain operating permits that include and assure compliance with applicable Clean Air Act requirements.

These permitting programs required under the Clean Air Act are proven tools for protecting air quality. But the Act's thresholds for determining when emissions of pollutants make a new or modified source subject to these permitting programs – 100 or 250 tons per year depending on the source category and permit program – were based on traditional pollutants and were not designed to be applied to greenhouse gases. EPA's greenhouse gas Tailoring Rule, issued in May 2010, uses a common-sense, phased approach to implementation of these permitting requirements, focusing on the largest polluters. As noted above, this rule was fully upheld by the D.C. Circuit in its recent decision, which found that the rule alleviated alleged harms to industry and state challengers and that the latter accordingly lacked standing to challenge the rule.²⁴

²⁴ *Coalition for Responsible Regulation, Inc. v. EPA*, No. 09-1322 (CADCA 2012), at . 73-81.

Under Step 1 of the Tailoring Rule, the greenhouse gas permitting program applied only to so-called “anyway” sources – new or modified facilities that triggered permitting for emissions of other pollutants and also have an increase in greenhouse gas emissions of 75,000 tons per year (tpy) of CO₂-equivalent (CO₂e). Under Step 2, which went into effect in July 2011, the program began to cover large new or modified facilities that would trigger permitting solely due to their greenhouse gas emissions. In this phase, PSD permitting requirements cover construction of new sources with greenhouse gas emissions of at least 100,000 tpy CO₂e. At existing facilities with existing greenhouse gas emissions of at least 100,000 tpy CO₂e, modifications that increase greenhouse gas emissions by at least 75,000 tpy CO₂e also are subject to PSD permitting requirements. Similarly, facilities that emit at least 100,000 tpy CO₂e are subject to the requirement for a Title V operating permit that includes and assures compliance with applicable Clean Air Act requirements.

The PSD permitting process for greenhouse gases is the same process used for many years for other regulated pollutants. In general, PSD permitting is conducted by the states, but depending on the proposed facility’s location, the permitting authority with jurisdiction may be the state, a local permitting agency, or EPA. State and local authorities have longstanding experience working together with owners and operators of industrial facilities. EPA has been working closely with permitting authorities to ensure that the transition to greenhouse gas permitting runs seamlessly.

As of June 10 of this year, several dozen large industrial sources of greenhouse gases – such as cement plants, power plants, refineries and steel mills – had received permits for greenhouse gases under these programs. For these sources, best available control technology for greenhouse gases is selected based on analysis of available technologies considering cost, just as it is for the other air pollutants emitted by these facilities. In most cases, the best available control technology selected for greenhouse gases is energy efficiency, which lowers emissions of greenhouse gases and other pollutants while reducing fuel consumption, saving facilities money. For example, new gas-fired power plants have selected turbines with the highest thermal efficiency.²⁵

²⁵ For example, the Pioneer Valley Energy Center is a 431 MW combined cycle power plant located in Westfield, MA. The GHG Best Available Control Technology (BACT) selected for this facility was the

In February 2012, EPA proposed Step 3 of the Tailoring Rule. In Step 3, EPA has proposed to maintain the Step 2 thresholds for greenhouse gas permitting requirements based on a finding that the Tailoring Rule's criteria for further lowering applicable emission thresholds for permitting requirements have not been met at this time. In addition, EPA has proposed to increase the availability of mechanisms to streamline permitting for greenhouse gas emission sources. For example, the proposed rule would revise the new source permit program to enable sources to use Plant-wide Applicability Limits (PALs) for greenhouse gases more broadly, in a manner that is more consistent with the way that this mechanism is used for conventional pollutants. As long as a plant stays within the plant-wide emissions limit, the new source review process is not triggered for further changes at the facility.

Proposing carbon pollution standards for power plants

On March 27, 2012, EPA proposed a Carbon Pollution Standard for New Power Plants.²⁶ Power plants represent the single largest source of industrial greenhouse gas emissions in the United States and account for approximately 40 percent of all U.S. anthropogenic CO₂ emissions.²⁷ EPA's proposed new source performance standard would, for the first time, set uniform national limits on the amount of carbon pollution new power plants can emit.

EPA's proposed standards apply to fossil-fuel-fired boilers, integrated gasification combined cycle (IGCC) units and stationary combined cycle turbine units that generate electricity for sale and are larger than 25 megawatts (MW). The proposed standards would require covered units to achieve an emission rate of 1000 pounds of CO₂ per

most energy efficient turbines commercially available for this size facility. (<http://www.epa.gov/region1/communities/pdf/PioneerValley/FactSheet.pdf>). Also, the Lower Colorado River Authority Thomas C. Ferguson Power Plant in Llano County, Texas applied for a permit to modernize and expand its plant. Energy efficient natural gas-fired combined cycle turbines were selected as GHG BACT along with other plant-wide energy efficiency measures that reduced the power consumed by the plant and increased the amount of power available for sale. (http://www.epa.gov/earth1r6/6pd/air/pd-r/ghg/lcra_sob.pdf)

²⁶ Standards of Performance for Greenhouse Gas Emissions for New Stationary Sources: Electric Utility Generating Units, 77 Fed. Reg. 22392 (April 13, 2012).

²⁷ Or 32.4% of all anthropogenic GHG emissions; from information in Table 2-1 from 'Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2009,' U.S. Environmental Protection Agency, EPA 430-R-11-005, April 2011.

megawatt hour. This standard could be met by current natural gas combined cycle units without controls, or by units fueled by coal or petroleum coke that implement carbon capture and sequestration (CCS). EPA has proposed an alternative compliance pathway, whereby units implementing CCS could comply by meeting the standard on average over the course of a 30-year period. A company could build a coal-fired plant and add CCS later, or a company that installs and operates CCS from the outset would have the flexibility to emit more CO₂ in the early years as it optimizes the controls over time.

The proposal does not apply to existing power plants or to “transitional” units, which include power plant units that already have Clean Air Act permits and that start construction within 12 months of the proposal. The transitional category also includes units that are part of a Department of Energy demonstration project for CCS and are in the process of renewing such permits, and that begin construction within 12 months of this proposal. In addition, the proposal does not apply to modifications of existing plants, or plants outside of the 48 contiguous states.

The nation’s electricity comes from diverse and largely domestic energy sources, including coal, nuclear, and, increasingly, natural gas and renewable energy sources. The proposed standard would not change this fact. The proposal reflects the ongoing trend in the power sector to build cleaner plants that take advantage of modern, technologies and fuels produced in the United States, and would ensure that current progress continues toward a cleaner, safer and more modern power sector. It provides a pathway forward for a range of important domestic resources, including coal with technologies that reduce carbon emissions.

Cutting emissions, energy waste and energy bills through voluntary programs

Complementing our regulatory efforts to reduce greenhouse gas emissions are EPA’s climate protection partnership programs, such as the ENERGY STAR programs and our domestic methane emission-reduction programs. These partnerships have implemented practical, proven, and cost-effective solutions for reducing greenhouse gas emissions. However, certain market barriers, such as lack of adequate consumer information, persist and continue to limit the widespread investment in and adoption of

energy efficiency, clean energy supply options, and other emissions reducing practices and technologies. EPA's partnership programs work to overcome these barriers – in the residential, commercial, and industrial sectors – by developing tools, offering technical assistance and public recognition, and sharing best practices.

Today, the ENERGY STAR label can be found on more than 65 different product categories with more than 5 billion sold over the past 20 years. To date, more than 1.3 million new homes and over 17,000 buildings across all 50 states have earned EPA's ENERGY STAR certification. Over 700 corporations, which operate thousands of U.S. manufacturing facilities, also participate in ENERGY STAR to build successful energy management programs. To illustrate, EPA's work with the cement industry has helped these manufacturers to improve energy performance. The energy efficiency of U.S. cement plants improved by 13 percent, equivalent to 61 trillion Btu in energy savings over a ten-year period.²⁸

EPA's climate protection partnership programs have achieved strong results over the past two decades. Cumulatively, consumers and businesses have reduced more than 5,400 million metric tons CO₂e of greenhouse gas emissions and enjoyed net savings of more than \$314 billion over the lifetime of their investments with the help of these programs. In 2010, alone, the most recent year for which data are available, consumers and businesses have reduced more than 345 million metric tons CO₂e of greenhouse gas emissions – equivalent to the annual emissions from 81 million vehicles – with net savings of about \$21 billion. More than 23,000 public and private partners across the country have joined our programs, investing about \$102 billion in energy-efficient, climate-friendly technologies during 2010.

Finally, EPA's SmartWay program for the freight transport sector has nearly 3,000 industry partners who commit to reduce fuel consumption and greenhouse gases in the existing fleet of trucks and supply chain operations by deploying strategies such as idling reduction devices, aerodynamic improvements, operational changes and tires

²⁸ Based on the improvement of the industry's performance between 1997 and 2008. See Boyd, Gale and Gang Zhang, "Measuring Improvement in the Energy Performance of the U.S. Cement Industry." Working Paper EE 11-05. Duke Environmental Economics Working Paper Series organized by the Nicholas Institute for Environmental Policy Solutions. May 2011.
<<http://nicholasinstitute.duke.edu/environmentaleconomics/measuring-improvement-cement-industry>>

designed to reduce fuel consumption. SmartWay partners have saved 55 million barrels of oil and 23.6 million metric tons of CO₂ from 2004 through 2010.

The Clean Air Act

EPA's recent actions to address greenhouse gas emissions under the Clean Air Act reflect tools and approaches that, for decades, have achieved dramatic successes in reducing pollution while supporting economic growth. For more than 40 years, the Clean Air Act has fostered steady progress in reducing the threats posed by pollution and allowing us all to breathe easier. In 2010 alone, programs implemented pursuant to the Clean Air Act Amendments of 1990 are estimated to have reduced premature mortality risks equivalent to saving over 160,000 lives; spared Americans more than 100,000 hospital visits; and prevented millions of cases of respiratory problems, including bronchitis and asthma attacks.²⁹ They also enhanced productivity by preventing 13 million lost workdays; and kept kids healthy and in school, avoiding 3.2 million lost school days due to respiratory illness and other diseases caused or exacerbated by air pollution.³⁰

However, few of the emission control standards that gave us these huge gains in public health were uncontroversial at the time they were developed and promulgated. Most major rules have been adopted amidst claims that that they would be bad for the economy and bad for employment. In contrast to doomsday predictions, history has shown, again and again, that we can clean up pollution, create jobs, and grow our economy all at the same time. Over that same 40 years since the original Act was passed, the Gross Domestic Product of the United States grew by more than 200 percent.³¹ And during that same time, total emissions of the six principal air pollutants dropped by more than 70 percent.³² It is misleading to say that the Clean Air Act is bad for the economy

²⁹ USEPA (2011). The Benefits and Costs of the Clean Air Act from 1990 to 2020. Final Report. Prepared by the USEPA Office of Air and Radiation. February 2011. Table 5-6. This study is the third in a series of studies originally mandated by Congress in the Clean Air Act Amendments of 1990. It received extensive peer review and input from the Advisory Council on Clean Air Compliance Analysis, an independent panel of distinguished economists, scientists and public health experts.

³⁰ Ibid.

³¹ Bureau of Economic Analysis, National Economic Accounts, "Table 1.1.5. Gross Domestic Product," <http://bea.gov/national/index.htm#gdp>

³² <http://epa.gov/airtrends/images/comparison70.jpg>

and employment. It isn't. Families should never have to choose between a job and healthy air. They are entitled to both.

The Clean Air Act also has been a good economic investment for our country. A study led by Harvard economist Dale Jorgenson found that implementing the Clean Air Act actually increased the size of the U.S. economy because the health benefits of the Clean Air Act lead to a lower demand for health care and a healthier, more productive workforce. According to that study, by 2030 the Clean Air Act will have prevented 3.3 million lost work days and avoided the cost of 20,000 hospitalizations every year.³³ Another study that examined four regulated industries (pulp and paper, refining, iron and steel, and plastic) concluded: "We find that increased environmental spending generally does not cause a significant change in employment."³⁴

The EPA's updated public health safeguards under the Clean Air Act will encourage investments in technology upgrades that can put current unemployed or underemployed Americans back to work. Environmental spending creates jobs in engineering, manufacturing, construction, materials, operation, and maintenance. For example, EPA vehicle emissions standards directly sparked the development and application of a huge range of automotive technologies that are now found throughout the global automobile market. The vehicle emissions control industry employs approximately 65,000 Americans with domestic annual sales of \$26 billion.³⁵ Likewise, in 2008, the United States' environmental technologies and services industry of 1.7 million workers generated approximately \$300 billion in revenues and led to exports of \$44 billion of goods and services,³⁶ larger than exports of sectors such as plastics and rubber products.³⁷ The size of the world market for environmental goods and services is comparable to the

³³ Dale W. Jorgenson Associates (2002a). *An Economic Analysis of the Benefits and Costs of the Clean Air Act 1970-1990. Revised Report of Results and Findings*. Prepared for EPA. [http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0565-01.pdf/\\$file/EE-0565-01.pdf](http://yosemite.epa.gov/ee/epa/erm.nsf/vwAN/EE-0565-01.pdf/$file/EE-0565-01.pdf)

³⁴ Morgenstern, R. D., W. A. Pizer, and J. S. Shih. 2002. "Jobs versus the Environment: An Industry-Level Perspective." *Journal of Environmental Economics and Management* 43(3):412-436.

³⁵ Manufacturers of Emissions Control Technology (http://www.meca.org/cs/root/organization_info/who_we_are)

³⁶ DOC International Trade Administration. "Environmental Technologies Industries: FY2010 Industry Assessment." [http://web.ita.doc.gov/ete/eteinfo.nsf/068f3801d047f26e85256883006ffa54/4878b7e2fc08ac6d85256883006c452c/\\$FILE/Full%20Environmental%20Industries%20Assessment%202010.pdf](http://web.ita.doc.gov/ete/eteinfo.nsf/068f3801d047f26e85256883006ffa54/4878b7e2fc08ac6d85256883006c452c/$FILE/Full%20Environmental%20Industries%20Assessment%202010.pdf) (accessed February 8, 2011)

³⁷ U.S. Census Bureau, Censtats Database, International Trade Data--NAICS, http://censtats.census.gov/naic3_6/naics3_6.shtml (accessed September 6, 2011)

aerospace and pharmaceutical industries and presents important opportunities for U.S. industry.³⁸

Jobs also come from building and installing pollution control equipment. For example, the U.S. boilermaker workforce grew by approximately 35 percent, or 6,700 boilermakers, between 1999 and 2001 during the installation of controls to comply with EPA's regional nitrogen oxide reduction program.³⁹ Between 2003 and 2010, the Institute for Clean Air Companies (ICAC) estimates that implementation of just one rule – the Clean Air Interstate Rule Phase 1 – resulted in 200,000 jobs in the air pollution control industry.⁴⁰

Conclusion

Greenhouse gas pollution, through its contribution to global climate change, presents a significant threat to Americans' health and to the environment upon which our economy and security depends. EPA over the past three years has proceeded in a careful and deliberate manner, in keeping with the requirements established by Congress under the Clean Air Act, to begin limiting carbon dioxide and other greenhouse gas pollution from the largest-emitting categories of mobile and stationary sources. The history of the Clean Air Act since 1970 makes clear that clean air and a healthy economy have gone hand in hand. The Act has created market opportunities that have helped to inspire innovation in cleaner technologies – technologies in which the United States has become a global market leader. Reducing emissions of carbon dioxide and other greenhouse gas pollution will require a gradual transition to cleaner energy sources and more efficient energy production and use. This transition is essential to the long-term protection of public health and the environment and, ultimately, offers real and meaningful economic opportunities to American consumers, entrepreneurs, and businesses.

³⁸ Network of Heads of the European Environment Protection Agencies, 2005. "The Contribution of Good Environmental Regulation to Competitiveness." http://www.eea.europa.eu/about-us/documents/prague_statement/prague_statement-en.pdf (accessed February 8, 2011).

³⁹ International Brotherhood of Boilermakers, *Boilermaker Labor Analysis and Installation Timing*, March 2005, EPA Docket OAR-2003-0053 (docket of the Clean Air Interstate Rule).

⁴⁰ November 3, 2010 letter from David C. Foerter, Executive Director of the Institute of Clean Air Companies, to Senator Thomas R. Carper (http://www.icac.com/files/public/ICAC_Carper_Response_110310.pdf (accessed February 8, 2011)).