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**Re: Advanced Notice of Proposed Rulemaking
Repeal of Carbon Pollution Emission Guidelines for Existing Stationary
Sources: Electric Utility Generating Units (Clean Power Plan)
EPA-HQ-OAR-2017-0355**

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The Heartland Institute submits the following comments in response to EPA’s [Advanced Notice of Proposed Rulemaking](#) (ANPR) titled *Repeal of Carbon Dioxide Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Clean Power Plan)*.

EPA issued the Clean Power Plan (CPP) under the authority of Section 111(d) of the Clean Air Act. That section authorizes EPA to establish emission guidelines for existing sources to reflect the “best system of emission reduction” (BSER) at each of those single sources themselves. But the CPP guidelines could be followed only by changing the power sources themselves, from coal to natural gas, and from fossil fuels altogether to renewables such as wind and solar.

We agree with the interpretation of Section 111(d) that EPA proposes in this proposed rulemaking. And we agree that under that interpretation, “the CPP exceeds the EPA’s statutory authority and [must] be repealed.”¹

For hundreds of years, since the industrial revolution, use of fossil fuels has tracked very closely with higher economic growth, GDP, incomes, wages, health, life expectancy, and population, and with reduced poverty. Continued use of fossil fuels will contribute to an economic boom, creating millions of new jobs, restoring rising real wages for the middle class and blue collar workers, and winning the War on Poverty, ultimately eliminating poverty in America.

America has the natural resources to be the world’s No. 1 producer of oil, No. 1 producer of natural gas, and No. 1 producer of coal. Foregoing that natural bounty and buried treasure because of unfounded fearmongering over catastrophic, anthropogenic, climate change would represent the greatest opportunity cost in world history.

The eight-year tenure of the Obama administration inflicted intentional, serious damage on the country’s capacity to provide the electricity that runs our computers; heats, cools, and lights our homes; powers our factories; and fuels our economy. The coal industry has been the principal target of the assault. It is, however, possible to reverse the policies that have caused this harm and allow the markets for electricity again to best meet consumer needs.

As Isaac Orr and Fred Palmer note in a recent *Policy Study* for The Heartland Institute²:

More than 250 coal-fired power plants have been retired since 2010, taking more than 34,000 megawatts (MW) of power generation capacity offline. As a result, coal’s share of the electricity generation market fell from 50 percent in 2008 to around 31 percent in 2017.

Most of the retired plants, 88 percent, were older, smaller units with a generating capacity of less than 250 MW. However, newer, more efficient coal-fired power plants with larger generating capacities also have been slated for retirement. The premature closure of these plants will cost consumers billions of dollars in higher electricity prices and lost economic opportunities.

These coal-plant closures are being driven by three factors: 1) Obama-era Environmental Protection Agency (EPA) regulations on carbon dioxide (CO₂) and other emissions; 2) national and state government policies that mandate the use and subsidize the producers of renewable energy sources; and 3) competition for electricity generation from low-cost natural gas.

¹ 40 CFR Part 60, FRL-9961-11-OAR, [Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units \(Clean Power Plan\)](#), Docket No. EPA-HQ-OAR-2017-0355, October 16, 2017, p. 5.

² Isaac Orr and Fred Palmer, “How to Prevent the Premature Retirement of Coal-Fired Power Plants,” *Policy Study* No. 148, The Heartland Institute, February 2018.

Low natural gas prices are the result of hydraulic fracturing and horizontal drilling, technological innovations that have made the United States the largest producer of natural gas in the world. By making previously unrecoverable natural gas resources economically accessible, the “fracking revolution” has changed the nation’s energy marketplace in ways that significantly benefit consumers and businesses.

By contrast, EPA regulations on CO₂, mercury, ozone, and small particulate matter, as well as market-distorting subsidies and mandates for renewable energy at the state and national level, provide zero measurable economic or environmental benefits. Worse, they put the reliability and affordability of the U.S. energy supply at great risk. In order to reverse the damage, the Trump administration, Congress, and state elected officials must move swiftly to revoke these policies and preserve the coal-fired electricity fleet.

There is no realistic prospect of catastrophic, anthropogenic, global warming or climate change resulting from continued use of fossil fuels, and absolutely no foundation for the CPP. For all of these reasons, we applaud EPA’s repeal of the Clean Power Plan as proposed in this Notice.

About The Heartland Institute

Headquartered in Arlington Heights, Illinois, [The Heartland Institute](#) was founded in 1984 as a national, nonprofit, research and education organization, tax exempt under Section 501(c)(3) of the Internal Revenue Code. It is not affiliated with any political party, business, or foundation.

Heartland’s mission is to discover, develop, and promote free-market solutions to social and economic problems. Such solutions include market-based approaches to environmental protection, privatization of public services, pro-growth economic policies, pro-choice free-market entitlement reform, parental choice in education, personal responsibility in health care, and deregulation where property rights and markets do a better job than government bureaucracies.

Heartland has 43 full-time and part-time employees and independent contractors, plus two dozen unpaid senior fellows and 450 academics and professional economists serving as policy advisors, all governed by a 12-member Board of Directors. All are able to provide testimony, articulate issue positions through the media, and help educate policymakers at all levels of government in the 50 states and Washington, DC.

Our policy advisors include members of the faculties of Harvard University, Massachusetts Institute of Technology, University of Chicago, University of Chicago Law School, Georgetown University Law Center, UCLA School of Law, Northwestern University, and scores of other respected universities. In addition, approximately 270 elected officials—Democrats and Republicans—serve on Heartland’s Board of Legislative Advisors.

Heartland is financed by donations from more than 5,000 individuals and foundations, comprising 84 percent of Heartland’s budget. Corporations finance 11 percent, with no single corporation providing more than 5 percent of total annual income.

Our publications are distributed to more than 8,300 state and national elected officials and to the media, civic and business leaders, educators, the general public, and others.

The Heartland Institute seeks to bring sound science and economics to the debate on environmental issues. We believe there is too much alarmism in these debates and too little attention paid to the real science. In the specific case of global warming, Heartland has been a major source of research and commentary in the United States questioning whether enough is known about climate change to justify costly government action.

As this submitted comment demonstrates, consideration of all relevant, peer-reviewed, academic articles on an array of climate change issues mandates that EPA abandon its attempts to regulate anthropogenic emissions of carbon dioxide and other so-called greenhouse gases because of the extreme uncertainty regarding the ultimate effect of those emissions, contrasted to the extreme certainty regarding the harmful effects of the CPP on reliable and affordable electricity, jobs, industries, and health and welfare.

The Heartland Institute has partnered with the Science and Environmental Policy Project (SEPP) and Center for the Study of Carbon Dioxide and Global Change to support the Nongovernmental International Panel on Climate Change (NIPCC), an international network of climate scientists, engineers, and other experts.

Originally created in 2003 by Dr. S. Fred Singer to fact-check the reports of the United Nations' Intergovernmental Panel on Climate Change (IPCC), NIPCC evolved as the world's preeminent "Red Team" in the climate change debate. NIPCC produces and The Heartland Institute publishes the *Climate Change Reconsidered* series of volumes presenting scientific research on climate change.

With the assistance of more than 50 climate scientists from around the world, NIPCC has produced 14 reports to date, all published by Heartland:

- Nature, Not Human Activity, Rules the Climate
- Climate Change Reconsidered: The 2009 Report of the Nongovernmental International Panel on Climate Change (NIPCC)
- Climate Change Reconsidered: 2011 Interim Report
- Climate Change Reconsidered II: Physical Science
- Climate Change Reconsidered II: Biological Impacts
- Scientific Critique of IPCC's 2013 'Summary for Policymakers'
- Commentary and Analysis on the Whitehead & Associates 2014 NSW Sea-Level Report
- Why Scientists Disagree About Global Warming
- Written Evidence Submitted to the Commons Select Committee of the United Kingdom Parliament
- NIPCC vs. IPCC

- Chinese Translation of Climate Change Reconsidered
- Global Warming Surprises: Temperature data in dispute can reverse conclusions about human influence on climate
- Data versus Hype: How Ten Cities Show Sea-level Rise Is a False Crisis
- Will Global Warming Overflow the Chesapeake Bay?

These reports have been cited more than 100 times in peer-reviewed articles and praised by leading climate scientists from around the world. *Climate Change Reconsidered II* is the world-leading discussion by world-class scientists doubtful of and skeptical about catastrophic, anthropogenic, global warming and climate change, on par with and in complete answer to the irregularly produced reports of the IPCC published by the United Nations. Another volume in the *Climate Change Reconsidered* series, addressing the benefits and costs of fossil fuels, is currently in production.

Other books on related topics published or distributed by Heartland include *Nothing to Fear: A Bright Future for Fossil Fuels*, *Merchants of Despair*, *Clexit for a Brighter Future*, *The Neglected Sun: Why the Sun Precludes Climate Catastrophe*, and *Unstoppable Global Warming: Every 1,500 Years*.

Heartland has organized scores of events, including 12 International Conferences on Climate Change since 2008, the most recent on March 23–24, 2017, in Washington, DC. Nearly 5,000 people have attended the conferences and all presentations are recorded, posted online, and more recently live-streamed to tens of thousands of viewers. Heartland’s most recent energy- and environment-related event was the America First Energy Conference, in Houston, Texas, November 9, 2017.

Further information about Heartland’s work on climate change is available on the website of The Heartland Institute’s Center on Climate and Environmental Policy at <https://www.heartland.org/Center-Climate-Environment/index.html>.

I. The Clean Power Plan (CPP) Is Based on an Erroneous Interpretation of Section 111(d) of the Clean Air Act.

A. Consequently, There Is No Legal Authority for the CPP, and It Must Be Repealed.

The Environmental Protection Agency (EPA) has issued an Advanced Notice of Proposed Rulemaking proposing repeal of the Clean Power Plan (CPP). 40 CFR Part 60, FRL-9961-11-OAR, Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Clean Power Plan), Docket No. EPA-HQ-OAR-2017-0355 (October 16, 2017). EPA reviewed the CPP in response to Executive Order 13783, and EPA’s notice of proposed repeal is the outcome of that review.

EPA originally issued the CPP under the legal authority of Section 111(d) of the Clean Air Act, 42 U.S.C. 7411. That section authorizes EPA to issue guidelines for existing sources of emissions that have been found to endanger the public health and welfare, which EPA concluded in its Endangerment Finding that carbon dioxide and other greenhouse gas emissions do. [Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202\(a\) of the Clean Air Act, 74 FR 66496 \(December 15, 2009\)](#). To make this policy change complete, that Endangerment Finding also should be reviewed and overturned, since carbon dioxide emissions do not endanger the public health and welfare.

Section 111(d) requires EPA's emission guidelines for existing sources to reflect the "best system of emission reduction" (BSER). Except for the CPP, all of EPA's other regulations based on Section 111(d) and Section 111(b), which applies to new sources, require BSER to consist of better equipping or operating each single source of the emissions.

But the CPP departed from this original and standard practice by setting emission guidelines that realistically could not be achieved by any technological or operational changes at each single source. The CPP guidelines could be followed only by changing the power sources themselves, from coal to natural gas, and from fossil fuels altogether to renewables such as wind and solar.

Under the CPP, each state is required to submit a plan on how it will limit CO₂ emissions for existing electricity generating units to comply with the EPA emission guidelines. See 80 FR 64707. As a practical matter, states could meet those guidelines only by shutting down coal-fired power plants and replacing them with natural gas-fired plants or renewable energy, and ultimately replacing the natural gas plants with renewables as well. We agree with the ANPR that this is energy policy, which the law reserves to the states and to the Federal Regulatory Energy Commission (FERC), not environmental policy, which legally comes under the purview of EPA.

Instead of complying with the CPP, a majority of the states (27) sued to stop the CPP, seeking judicial review in the United States Court of Appeals for the District of Columbia Circuit. [West Virginia v. EPA, No. 15-1363](#) (and consolidated cases) (D.C. Cir.). On February 9, 2016, the U.S. Supreme Court stayed implementation of the CPP, pending final judicial review. [Order in Pending Case, West Virginia v. EPA, No. 15A773](#) (U.S. February 9, 2016). The case is currently being held in abeyance at the DC Circuit. Order, Docket Entry No. 1687838 (August 8, 2017).

President Donald Trump issued [Executive Order 13783](#) on March 28, 2017 affirming in Section 1 the "national interest to promote clean and safe development of our nation's vast energy resources, while at the same time avoiding regulatory burdens that unnecessarily encumber energy production, constrain economic growth, and prevent job creation." The Order directed EPA "to immediately review existing regulations that potentially burden the development or use of domestically produced energy resources and appropriately suspend, revise, or rescind those that unduly burden the development of domestic energy resources beyond the degree necessary to protect the public interest or otherwise comply with the law." *Id.*, Section 1(c). The Executive Order specifically directs EPA to review and initiate reconsideration proceedings to "suspend, revise, or rescind" the CPP "as appropriate and consistent with law." *Id.*, Section 1(e).

We agree that compliance with Executive Order 13783, and the law governing EPA, requires that the CPP be repealed. We agree with the interpretation of Section 111(d) that EPA proposes in this proposed rulemaking. Section 111(d) authorizes EPA to adopt emission guidelines that require only technological or operational measures and BSEER applying to each single source, not requiring changes in the sources themselves, as the CPP does. We agree, as EPA states in this proposed rulemaking, that this interpretation of Section 111(d) “is consistent with the CAA’s text, context, structure, purpose, and legislative history, as well as with the Agency’s historical understanding and exercise of its statutory authority.” 40 CFR Part 60, FRL-9961-11-OAR, Repeal of Carbon Pollution Emission Guidelines for Existing Stationary Sources: Electric Utility Generating Units (Clean Power Plan), Docket No. EPA-HQ-OAR-2017-0355 (October 16, 2017), at 5. We agree that “[u]nder the interpretation [of Section 111(d)] proposed in this notice, the CPP exceeds the EPA’s statutory authority and [must] be repealed.” *Id.*

B. The Costs of the Short-Lived CPP Have Already Vastly Exceeded Even EPA’s Expected Benefits.

The CPP sought to reduce carbon dioxide emissions from existing power plants across the country to 32 percent below 2005 levels by 2030. Although CPP was never implemented, its looming threat caused significant damage to the energy sector because utility companies must plan years ahead and in many cases have already altered their electricity generation portfolios in order to comply with this Obama-era regulation.³

Highly inaccurate and problematic assumptions that underlie the CPP show just how dangerous EPA can be to the economic and even environmental health of the United States and its citizens. The overall 32 percent emissions reduction sought by CPP was supposed to be achieved by setting targets for each state as shown in Figure 1.^{4,5}

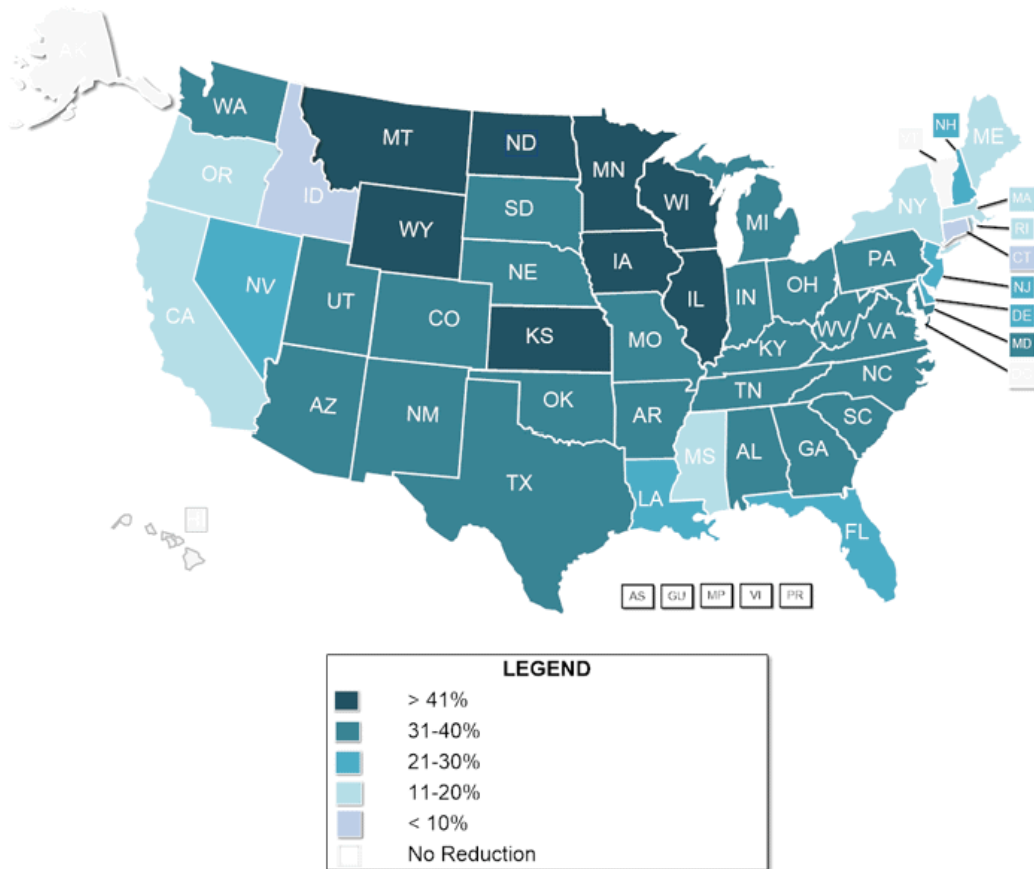
EPA projected the capacity of coal-fired power plants that would have to be closed in each state to meet the emissions reduction targets. (See Figure 2.)

³ Caitlin Sievers, “[We Energies to Close Pleasant Prairie Power Plant](#),” *The Journal Times*, November 30, 2017.

⁴ Jonathan H. Adler, “[Supreme Court Puts the Brakes on EPA’s Clean Power Plan](#),” *The Washington Post*, February 9, 2016.

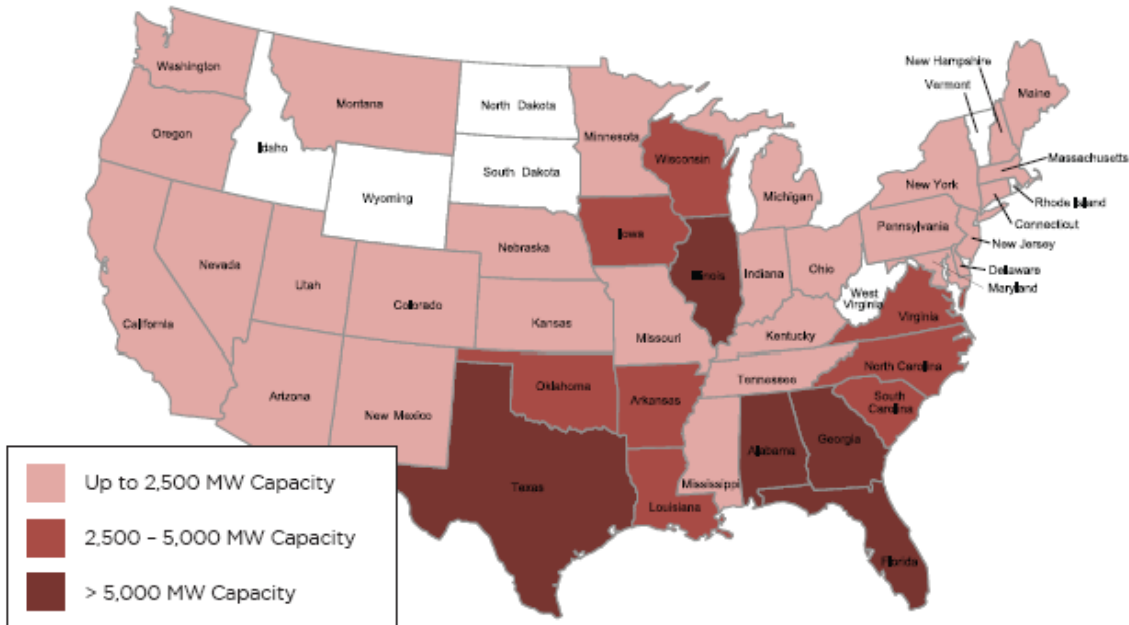
⁵ Jocelyn Durkay, “[States’ Reaction to EPA Greenhouse Gas Emission Standards](#),” National Conference of State Legislatures, April 18, 2016.

Figure 1
Total Emission Reductions Percentage by 2030
(from 2012 levels)



The emissions reductions required under the CPP varied dramatically by state. Northern states and those in the Rust Belt would have been heavily affected had these regulations gone into effect. *Source:* Jocelyn Durkay, "[States' Reaction to EPA Greenhouse Gas Emission Standards](#)," National Conference of State Legislatures, April 18, 2016.

Figure 2
EPA-Projected Coal Capacity Retirements Under 111(d) Proposal*
(2016–2020)



*Excludes committed retirements prior to 2016

Source Data: <http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OAR-2013-0602-0220>

CPP regulations were projected to result in the retirement of coal-fired power plants in nearly every state. The regulations would generally have affected southern and Midwestern states the most. *Source:* Southern States Energy Board, “[Projected 2016–2020 Existing Generating Unit Retirements Under 111\(d\) Proposal](#),” accessed September 19, 2017.

The prospect of complying with the CPP weighed heavily in the decision-making process of power companies. Since burning coal for electricity generation emits approximately twice as much CO₂ as burning natural gas, the proposed regulations led many utility companies and state Public Utility Commissions to retire coal-fired generating units.⁶

If implemented, CPP would have been one of the most expensive regulations in U.S. history. EPA estimated the annual cost of complying with the rules would range between \$5.1 billion and \$8.4 billion. NERA Economic Consulting estimated the rules could cost dramatically more, between \$29 billion and \$39 billion per year, more than a quarter-trillion dollars over a standard 10-year federal budget planning cycle.⁷ NERA also estimated CPP regulations would have caused electricity bills to increase between 11 percent and 14 percent per year. That would mean

⁶ Trevor House, *et al.*, [“Can Coal Make a Comeback?”](#) Center on Global Energy Policy, April 2017.

⁷ NERA Economic Consulting, [“Energy and Consumer Impacts of EPA’s Clean Power Plan,”](#) Insight in Economics, November 7, 2015.

electricity costs doubling every five to seven years. At that rate of growth, electricity costs would have multiplied to eight times as great after 15 to 21 years. Other studies also concluded EPA's official cost estimates were unrealistically low.⁸

Despite the high price tag associated with CPP, it would have delivered no measurable environmental benefits. According to the Obama-era EPA-sponsored Model for the Assessment of Greenhouse Gas Induced Climate Change (MAGICC), the CPP regulations, if implemented, would have averted only .019 degrees C of potential future warming by 2100.^{9,10} This amount is too low to be accurately measured with even the most sophisticated scientific equipment. Given that most climate models have predicted too much warming, the reductions in future "global temperatures"¹¹ resulting from CPP would likely have been even lower. In other words, by EPA's own estimates, the CPP was all pain and no gain.

Writing in *USA Today* about the September 27, 2016 U.S. Court of Appeals for the District of Columbia Circuit hearing concerning the litigation over CPP, Tom Harris, executive director of the Ottawa, Canada-based International Climate Science Coalition, explained:

The focus for opponents of the CPP will be its questionable legality. However, the nine judges hearing the case should also keep in mind that the rules are pointless. The CPP will have no measurable impact on climate.

EPA Administrator Gina McCarthy has repeatedly admitted this before Congressional hearings. She maintains that the CPP is still worthwhile because, to quote from her Sept. 18, 2013, testimony before the House Subcommittee on Energy and Power, it "is part of an overall strategy that is positioning the U.S. for leadership in an international discussion, because climate change requires a global effort."

Setting a good example would make sense if it were known that a man-made climate crisis was imminent and developing nations, the source of most of the world's emissions, were likely to follow our lead.

But developing countries have indicated that they have no intention of following us. They will not limit their development for 'climate protection' purposes.

For example, on July 18, President Rodrigo Duterte of the Philippines said about the Paris climate agreement, "You are trying to stymie [our growth] with an agreement... That's stupid. I will not honor that."

⁸ Jonathan A. Lesser, [Missing Benefits, Hidden Costs, The Cloudy Numbers in the EPA's Proposed Clean Power Plan](#), The Manhattan Institute, June 2016; Kevin Dayaratna, ["The Economic Impact of the Clean Power Plan,"](#) Testimony before the Committee on Science, Space and Technology, June 24, 2015, The Heritage Foundation.

⁹ *Id.*

¹⁰ Patrick Michaels and Paul Knappenberger, ["Spin Cycle: EPA's Clean Power Plan,"](#) Cato Institute, August 5, 2015.

¹¹ In this document we put "global temperature" in quote marks since a global temperature does not actually exist – it is merely a computed statistic that, many scientists assert, has questionable significance. See Christopher Essex, Ross McKittrick, and Bjarne Andresen, ["Does a Global Temperature Exist?"](#), *Journal of Non-Equilibrium Thermodynamics* (June 2006).

Duterte can say this with a clear conscience. The United Framework Convention on Climate Change, the foundation of the Paris Agreement, gives an out clause for developing nations. Article 4 of the treaty states, “Economic and social development and poverty eradication are the first and overriding priorities of the developing country Parties.”

Actions to significantly reduce CO₂ emissions would entail dramatically cutting back on the use of coal, the source of 81 percent of China’s electricity, 71 percent of India’s, and 29 percent of that of the Philippines. As coal is by far the least expensive source of electric power in most of the world, reducing CO₂ emissions by restricting coal use would unquestionably interfere with development priorities. So developing countries simply won’t do it.¹²

In other words, the sacrifices of the U.S. and other developed nations will be for nothing. Hence the wisdom of EPA’s now proposed repeal of the CPP.

Significantly reducing CO₂ emissions would require dramatically cutting back on the use of coal, the source of 81% of China’s electricity, 71% of India’s, and 29% of the Philippines’. As coal is by far the least expensive source of electric power in most of the world, reducing CO₂ emissions by restricting coal use would unquestionably interfere with economic development priorities. So developing countries simply won’t do it. The sacrifices of the U.S. and other developed nations will be for nothing.

All of this shows the wisdom of EPA’s proposed repeal of the CPP. CPP is not the law of the land, thanks to the U.S. Supreme Court’s 2016 ruling, and EPA is withdrawing it as quickly as the law and review requirements permit. But this message hasn’t reached many public utility commissioners, state legislators, and business and civic leaders. The CPP is a prime example of an Obama-era zombie regulation, a regulation blocked by courts and being repealed by the new administration but falsely assumed to still be official policy.

II. Fossil Fuels Are Essential to American Prosperity and the American Dream

A. Worldwide, and for hundreds of years since the Industrial Revolution, fossil fuel use is and has been associated with higher economic growth, GDP, incomes, wages, health, life expectancy, population, and reduced poverty.

In their book *Fueling Freedom: Exposing The Mad War on Energy*¹³, Stephen Moore and Kathleen Hartnett White explain the economics of energy. They write,

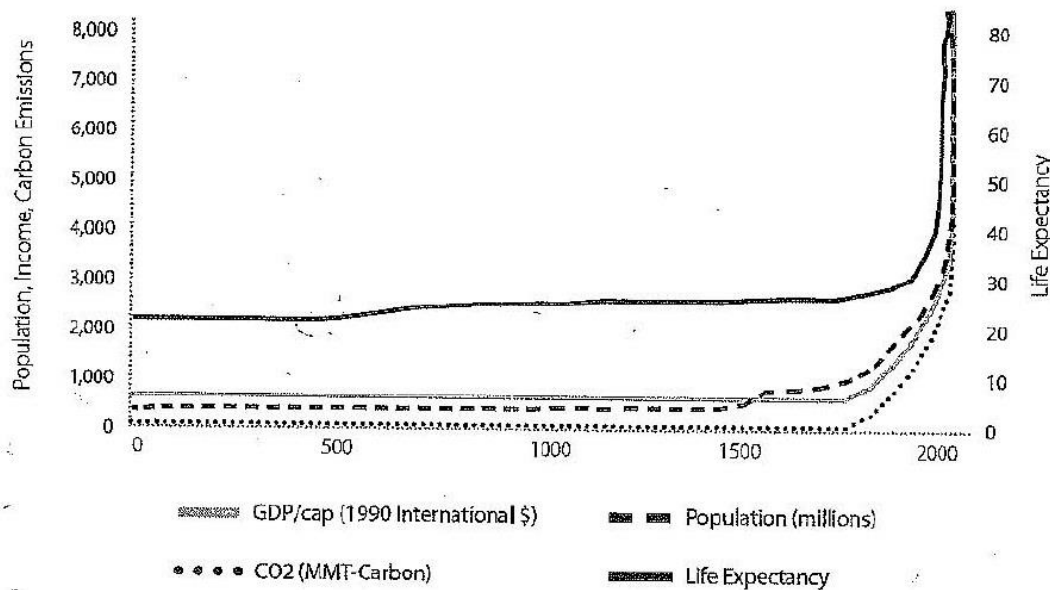
¹² Tom Harris, “[Judges Must Understand: Climate Rules Are Irrational](#),” *USA Today*, September 24, 2016.

¹³ Stephen Moore and Kathleen Hartnett White, *Fueling Freedom: Exposing the Mad War on Energy* (Washington, DC: Regnery Publishing 2016).

Our book begins by recognizing the “Great Fact” of human progress. Something monumental happened around 1800, something that had never happened before. For millennia, the average human life was short and lived at subsistence level. The growth of the human population was slower than a crawl. But in the nineteenth century, there began a substantial and sustained improvement in the fundamental measures of human well-being.¹⁴

What happened was the Industrial Revolution. Moore and White illustrate the impact in Figure 3.

Figure 3
Global Progress, 1 AD–2009 AD



Sources: Updated from Indur Goklany, “Have Increases in Population, Affluence and Technology Worsened Human and Environmental Well-being?” *Electronic Journal of Sustainable Development* 1, no. 3 (2009); based on Bruce W. Frier (2001). “More is worse: some observations on the population of the Roman empire”, in Walter Scheidel, *Debating Roman Demography*, URL = <https://books.google.com/books?id=vh3pmAodawEC&pg=PA144#v=onepage&q&f=false>; Angus Maddison, *Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD*, University of Groningen, 2010, http://www.ggdc.net/MADDISON/Historical_Statistics/vertical-file_02-2010.xls; World Bank, *World Development Indicators 2015*, <http://databank.worldbank.org/>; T.A. Boden, R. J. Andres, *Global CO2 Emissions from Fossil-Fuel Burning, Cement Manufacture, and Gas Flaring, 1751-2011*, at http://cdiac.ornl.gov/ftp/ndp030/global.1751_2011.ems, visited December 15, 2015; CDIAC, *Preliminary 2011 and 2012 Global & National Estimates*, at http://cdiac.ornl.gov/ftp/trends/co2_emis/Preliminary_CO2_emissions_2012.xlsx, visited February 2, 2016. Notes: Data are sporadic until 1960. This figure assumes that trends between adjacent data points are linear. Life expectancy is a surrogate for human well-being; living standards are depicted by affluence, or GDP per capita; and CO2 is a proxy for fossil-fuel usage.

Source: Stephen Moore and Kathleen Hartnett White, *Fueling Freedom* (New York, NY: Regnery Publishing, 2016), Figure 1.1, page 5.

¹⁴ *Id.*, p. 2.

That figure “charts four basic measures of human welfare over the past two thousand years—life expectancy, real income per capita, population, and energy consumption.”¹⁵ Emissions of carbon dioxide resulting from human activity are used in the chart as a surrogate for consumption of energy derived from fossil fuels. The figure shows all four measures of human welfare remaining virtually unchanged for nearly the entire 2,000 years, until 1800, when all four start shooting almost straight up together, ushering in the arrival of the modern world.¹⁶

The authors explain,

The almost vertical trajectory of our graph that begins around 1800 coincides with the beginning of the English Industrial Revolution. ... an energy enrichment that spawned phenomenal economic productivity and dramatic improvements in human living conditions. What textbooks call the Industrial Revolution might be better described as mankind’s Great Energy Enrichment.¹⁷

The authors quote historian Carlo Cibolla explaining, “the Industrial Revolution can be defined as the process by which a society acquired control over vast sources of inanimate energy.”¹⁸

Moore and White add, “Those sources were fossil fuels, first coal in England, soon followed by natural gas, and then crude oil in the twentieth century.”¹⁹

Moore and White add further,

few people appreciate that this spectacular improvement in the human condition is really a story of the fossil fuels revolution. The world moved away from inefficient and limited “green” energy like the medieval windmill to coal and other modern forms of energy that could be adopted on an industrial scale. Fossil fuels were a necessary condition of the Industrial Revolution’s unprecedented improvements.²⁰

The authors elaborate, “Is it not startling that most of humanity had been stuck with a real average income of \$1 to \$7 per day until the past two centuries?”²¹ They explain, “Average real income per capita—on a global basis—is now ten to twenty times higher than at the beginning of the industrial revolution.”²²

The authors further explain the implications for economic growth.

The same graph also depicts the unprecedented economic growth driven by industrialization. The economic historian Deirdre McCloskey puts it in perspective: “The scientific fact established over the past 50 years by the labors of

¹⁵ *Id.*, p. 5.

¹⁶ *Id.*, p. 5.

¹⁷ *Id.*, pp. 4–5.

¹⁸ *Id.*, p. 5.

¹⁹ *Id.*

²⁰ *Id.*, pp. 2–4.

²¹ *Id.*, p. 4.

²² *Id.*, p. 5.

economists and economic historians is that modern economic growth has been astounding, unprecedented, unexpected, the greatest surprise in economic history.” Economic growth and increased energy consumption were tightly connected over the past century. In 2000, the correlation between energy consumption and income per capita across sixty-three countries was an extremely close 96 percent.²³

Both energy consumption and gross world product increased 16-fold in the 100 years of the twentieth century.²⁴ “The rise of gross world product from \$2 trillion to \$32 trillion within a century is nothing less than astonishing,”²⁵ Moore and White note.

A similar increase resulted in population. Moore and White again explain, “In our graph of human progress, population barely increases over the first millennium A.D. Between the years 1000 and 1750, the global population increases substantially, tripling to 760 million. But from 1750 to 2009, population rises eightfold, to almost 7 billion human beings—a decisive departure from all previous epochs.”²⁶

Moore and White add,

Never before has mankind been better nourished. As we shall show, you can thank fossil fuels for a global food supply that exceeds the demand of more than seven billion mouths. . . . In America, we produce three times as much food as we did a century ago, in one-third fewer manhours, on one-third fewer acres, and at one-third the cost. In the past, more than half of Americans were employed in agriculture, and food was still relatively scarce and expensive. Now about 3 percent of the population produces all the food that 300 million Americans consume. We even have to often pay farmers to stop growing so much food.²⁷

With the increased fossil fuel use of the Industrial Revolution came increased carbon dioxide emissions. Moore and White note, “Before the Industrial Revolution, man-made emissions of carbon dioxide were marginal. The United States now uses about two hundred times more energy than in 1800, and almost all of it comes from fossil fuels.”²⁸

Fossil fuels are clearly essential for economic growth, the prosperity of the American people, and the survival of the American Dream, especially for working people, blue collar workers, and the middle class. Fossil fuels are also essential to sharply reducing and ultimately eliminating poverty in America, and to perpetuating the health and wellbeing of millions.

²³ *Id.*, pp. 6–7.

²⁴ *Id.*, p. 7

²⁵ *Id.*

²⁶ *Id.* p. 6.

²⁷ *Id.*

²⁸ *Id.*, p. 4

B. Even after decades of government subsidy and favoritism, alternative energy sources such as solar and wind play only a niche role in U.S. energy supplies.

In sharp contrast to the fossil fuel story, Moore and White discuss alternative, renewable energy:

For many centuries mankind relied on what is now called “renewable energy”—windmills, wood, water, and the Sun. The notion that green energy is “in its infancy” is laughable. These sources of energy go back thousands of years. And the data recently gathered by economic historians ... show that wind and water wheels never provided much power. It wasn’t until man harnessed fossil fuels—primarily oil, gas and coal—that industrialization achieved unprecedented productivity.²⁹

Christopher Horner of the Competitive Enterprise Institute adds, “[Y]ou can build windmills with steel, but you can’t build steel with windmills.”³⁰ Moore and White elaborate, “The great steel works of Pittsburgh could not have built America’s industrial framework if their power had come from windmills. Detroit’s automobiles could not have replaced horses (and horse manure) if they had run on solar power.”³¹

Moore and White summarize,

With this book, we aim to document and explain the extent to which fossil fuels have vastly improved human life across the planet, releasing whole populations from abject poverty. Virtually everything needed to sustain the life of a human being—food, heat, clothing, shelter—depends upon access to and conversion of energy. The productivity fueled by hydrocarbon energy sources, coupled with economic freedom, allowed the emergence of an enduring middle class for the first time in history.³²

Moore and White conclude,

Today, hundreds of years after the Industrial Revolution began, most of the human population is dependent on fossil fuels for 80 to 90 percent of its energy supply. That will surely be the case at least for many decades. The long-held superstition that America is running out of oil and gas has been disproved with the latest shale oil and gas revolution.³³

²⁹ *Id.*, p. xiv.

³⁰ *Id.*

³¹ *Id.*

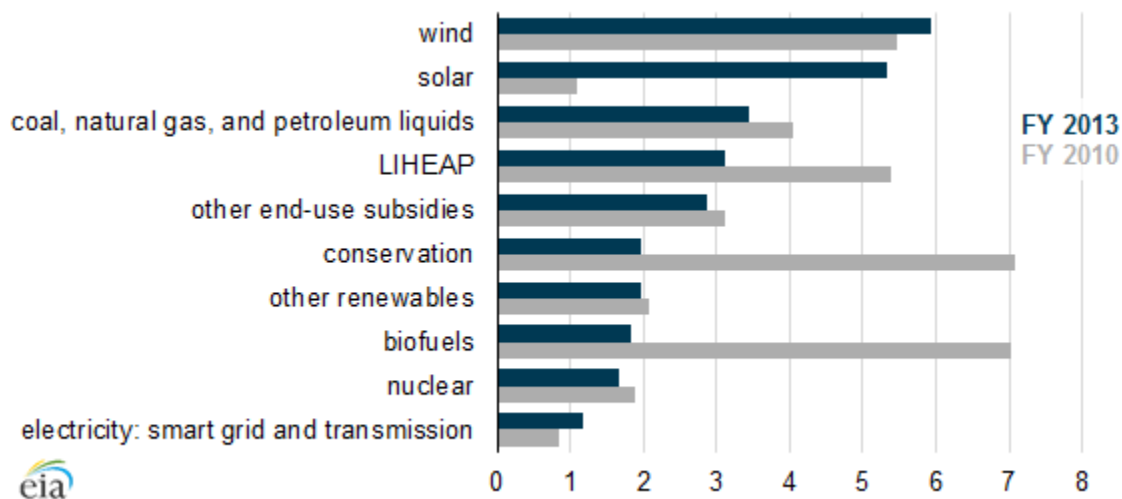
³² *Id.*

³³ *Id.*

Yet, despite the obvious dominance of and continued need for fossil fuels, wind and solar receive far more subsidies than any other source of energy, both in absolute terms and on a per-unit-of-energy-generated basis.³⁴

In 2013, the most recent year for which data are available, wind received more subsidies than any other energy source at \$5.9 billion (see Figure 4). Solar was the second largest with \$5.3 billion. By contrast, nuclear energy received \$1.66 billion, coal received \$1.07 billion, and oil and natural gas received \$2.35 billion.³⁵ In recent years, federal renewable energy subsidies have totaled *more than three times the subsidies paid for all fossil fuels and nuclear energy combined*.³⁶

Figure 4
Quantified Energy-Specific Subsidies and Support by Type
Fiscal Years 2010 and 2013
 in billion 2013 dollars



Government subsidies supporting wind and solar combined for \$11.2 billion in 2013, while coal received \$1.07 billion. LIHEAP is the Low Income Home Energy Assistance Program, which helps families pay their energy bills. Spending on that program increased by nearly 50% in just three years from 2010 to 2013. *Source:* U.S. Energy Information Administration, “[Total Energy Subsidies Decline Since 2010, With Changes in Support Across Fuel Types](#),” *Today in Energy* (website), March 13, 2015.

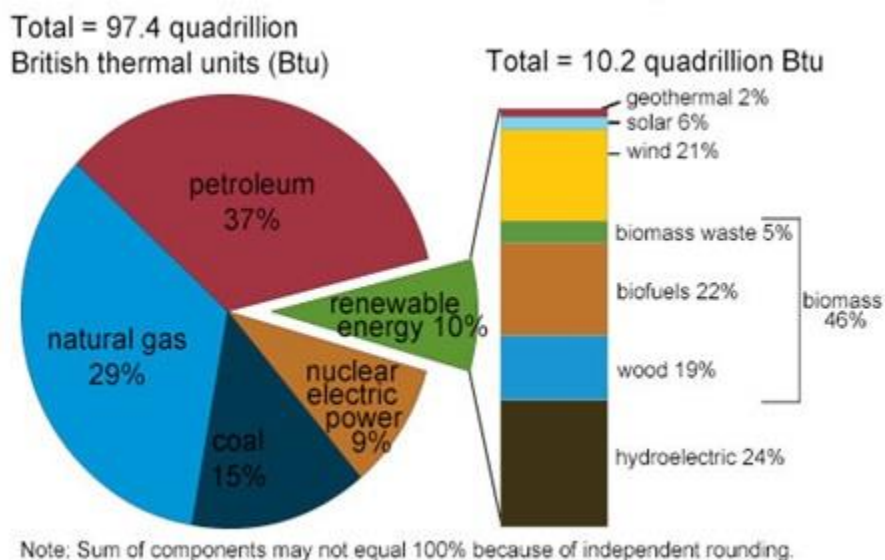
³⁴ U.S. Energy Information Administration, “[Direct Federal Financial Interventions and Subsidies in Energy in Fiscal Year 2013](#),” *Analysis and Projections*, March 23, 2015.

³⁵ U.S. Energy Information Administration, “[Total Energy Subsidies Decline Since 2010, With Changes in Support Across Fuel Types](#),” *Today in Energy* (website), March 13, 2015.

³⁶ Management Information Services, Inc. [Two Thirds of a Century and \\$1 Trillion+ U.S. Energy Incentives Analysis of Federal Expenditures for Energy Development, 1950–2016](#), prepared for the Nuclear Energy Institute, May 2017.

Despite the fact that renewable energy sources are the most highly subsidized forms of energy, they accounted for only 2.7 percent of the total energy consumed in the United States in 2016. In contrast, oil provided 37 percent, natural gas 29 percent, coal 15 percent, and nuclear energy 9 percent of total energy consumption (see Figure 5).

Figure 5
U.S. Energy Consumption by Energy Source, 2016

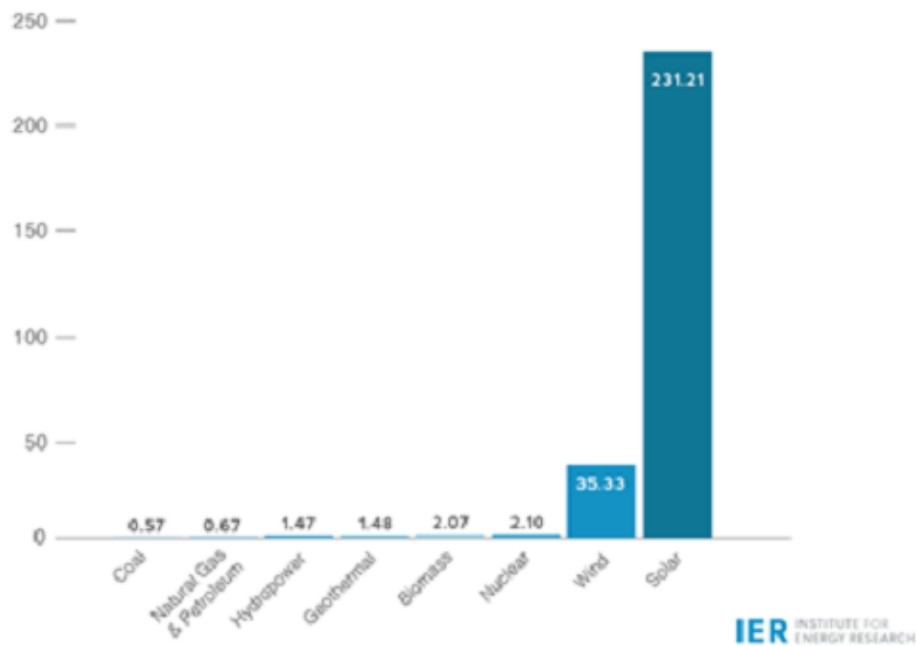


Wind and solar power are the most heavily subsidized forms of energy, yet they provide almost no energy in terms of total energy consumption. Combined, these two forms of energy provide less than 3 percent of energy use in the United States. Source: [U.S. Energy Information Administration, Monthly Energy Review](#), Table 1.3 and 10.1, April 2017, preliminary data.

Subsidies to wind and solar are large in absolute terms and even larger when considered per unit of energy produced. In these terms, wind received \$35.33 per MWh and solar received \$231.21/MWh, while coal received only \$0.57/MWh and natural gas and petroleum received only \$0.67/MWh. Wind and solar consequently received 52 times and 345 times more in subsidies than coal, respectively (see Figure 6), per unit of energy produced.³⁷

³⁷ Institute for Energy Research, "[EIA Report: Subsidies Continue to Roll In For Wind and Solar](#)," March 18, 2015.

Figure 6
Federal Electric Subsidies
Per Unit of Production, FY 2013
 2013 dollars per megawatt hour



Federal subsidies for wind and solar grew dramatically from 2010 to 2013. On a per unit of energy basis, wind and solar received 52 times and 345 times more subsidies than coal, respectively. *Source:* Institute for Energy Research, “[EIA Report: Subsidies Continue to Roll In For Wind and Solar](#),” March 18, 2015.

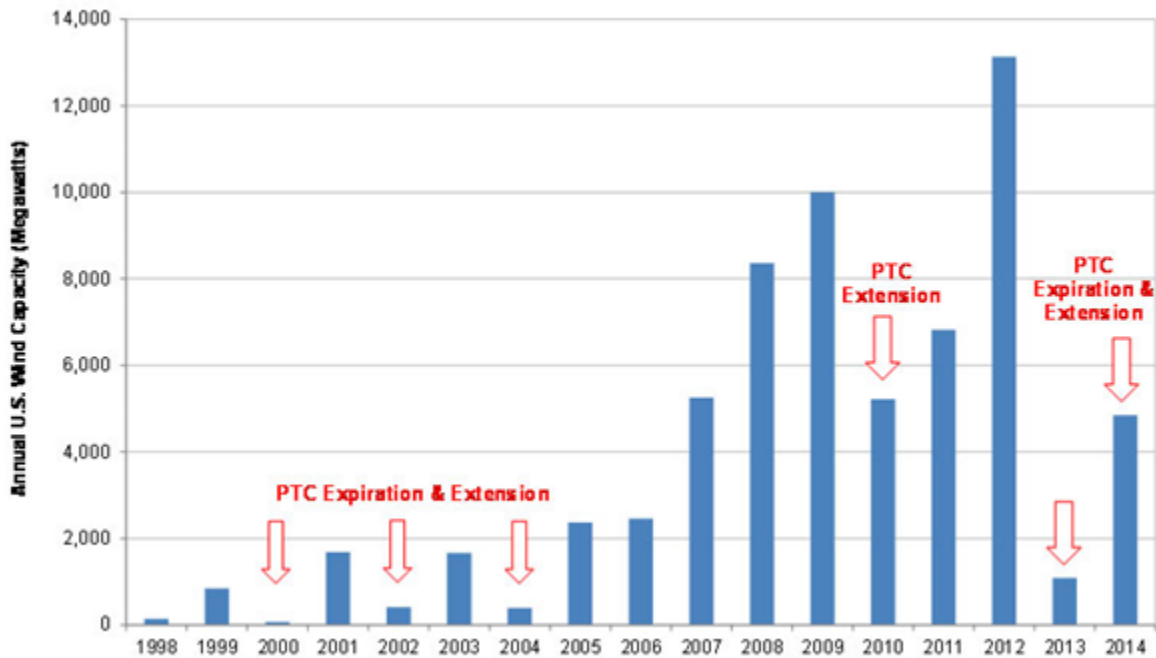
Recent data suggest very few wind power facilities would be built without the federal wind Production Tax Credit (PTC – see Figure 7). Without federal, state, and local government subsidies and mandates, the renewable energy industry would not survive in the United States. As Warren Buffet, CEO of Berkshire Hathaway and “one of the most successful investors of all time,”³⁸ stated, “We get a tax credit if we build a lot of wind farms. That’s the only reason to build them. They don’t make sense without the tax credit.”³⁹

Federal subsidies distort wholesale power markets by artificially increasing the amount of wind and solar generation fed into the grid. Although wind and solar receive more subsidies in absolute terms and on a per-unit-of-energy basis than any other source of energy, they account for just 6.5 percent of electricity generation. It is difficult to argue this money has been well spent.

³⁸ [Profile: Warren Buffet](#), *Forbes* (website), accessed November 28, 2017.

³⁹ Grant Kidwell, “[Iowa Wind Farm Generates More Tax Credits than Electricity](#),” *The Hill*, October 6, 2016.

Figure 7
Impact of Production Tax Credit Expiration and Extension
On U.S. Annual Installed Wind Capacity



In the years following expiration of the wind PTC, wind power installations dropped between 76 and 93 percent, suggesting wind installations are not competitive without federal subsidies. *Source:* Union of Concerned Scientists, "[Production Tax Credit for Renewable Energy](#)" (website), accessed September 27, 2017.

Discussing the subsidies and total energy contributions of renewables tells only part of the story. Even in states where large portions of electricity are derived from renewable energy sources—like California, which mandates 50 percent of the state’s energy must come from renewables by 2030—natural gas-fired power plants must be ready to provide electricity because renewable energy sources like wind and solar are intermittent (the wind does not always blow, and the sun does not always shine—e.g., at night). The need to maintain and continue fossil fuel energy production as a backup is a primary reason why renewables cost so much more than fossil fuels.⁴⁰ In other words, alternative energy is not truly an alternative to fossil fuels.

Germany is a good example of a nation that tried, and failed, to switch from fossil fuels to renewables, despite the full support of government. Businesses and households in Germany paid

⁴⁰ As Benny Peiser at the Global Warming Policy Foundation explains, "(Every 10 new units worth of wind power installation has to be backed up with some eight units worth of fossil fuel generation. That is because fossil fuel units have to power up suddenly to meet the deficiencies of intermittent renewables. In short, renewables do not provide an escape route from fossil fuel use, without which [the renewables] are unsustainable. ...To avoid blackouts [with renewables], the government has to subsidize uneconomic [because part-time backup] gas and coal power plants." Benny Peiser, "[EU'S Green Energy Debacle Shows the Futility of Unilateral Climate Policies](#)," *Financial Post*, April 14, 2015.

an extra 125 billion euros in increased electricity bills from 2000 to 2015 to subsidize renewables.⁴¹ As a result, “Germans join Danes in paying the highest household electricity rates in Europe, and German companies pay near the top among industrial users.”⁴² Indeed, German households pay three times what American households pay for electricity.⁴³ Yet, despite that economically crippling cost burden, only one-third of German electricity comes from renewables today, compared to still 40 percent for coal.⁴⁴

Fundamental laws of physics explain why fossil fuels are so much more effective and less expensive than renewables. The energy in fossil fuels is much more concentrated than in renewables. The energy blowing in the wind, or dancing on sunbeams, is widely dispersed. Collecting it in usable form is inherently difficult, challenging, land-intensive, and expensive.

The CPP’s mandates that states build more renewable generation would decrease the reliability and affordability of electricity, while still requiring that reliable coal or natural gas power plants be available to supply power when intermittent generation sources are not delivering electricity. That would mean slower economic growth, reduced prosperity, and increased poverty in America. Niche renewables could never power the modern twenty-first century American economy. The U.S. economy would flounder, with its energy industries surviving only as “welfare queens.” This is again why the Trump administration must repeal the CPP now.

No one in the federal government is actually looking at the enormous economic **liabilities** that are likely to result from adding wind and solar to the energy generation mix. Every community where we have seen a genuine pro-and-con wind energy financial analysis done, the result has been negative — and usually by a substantial margin.

Wind turbine salesmen explain economic benefits to a community from erecting a local wind energy project, such as rate revenues paid to the operator for the energy produced, lease payments to landowners of the properties where the wind turbines are to be located, local tax revenues generated by building and operating the project from property taxes, sales taxes, and others. But as physicist John Droz⁴⁵ correctly points out, a full economic analysis requires a complete NET financial analysis, including the reliability of the wind energy to be produced, the full costs to ratepayers and taxpayers, the proximity of users of the energy and demand for it, and the dispatchability (transmission) of the energy produced to those users to satisfy that demand.

The advocates of wind energy never tell us about the independent studies demonstrating that agricultural yields decrease within 15 miles from a wind project.⁴⁶ As Droz reports, “In some cases, after lease payments begin [to landowners for wind turbines on their land] local farms terminate operations. This results in reduced local employment, reduced local procurements, and

⁴¹ [“Germany’s Green Energy Meltdown,”](#) *The Wall Street Journal*, Saturday/Sunday November 18-19, 2017, p. A12.

⁴² *Id.*

⁴³ *Id.*

⁴⁴ *Id.*

⁴⁵ John Droz, Jr., [“Wind Energy: Local Economics 101,”](#) Alliance for Wise Energy Decisions, December 27, 2017.

⁴⁶ John Droz, Jr., [“Industrial Wind Projects Clash with Real Farming,”](#) Alliance for Wise Energy Decisions, December 1, 2017; Lisa Linowes, [“The Incompatibility of Wind and Crop Farming,”](#) *Master Resource* (website), July 1, 2013.

reduced local produce.”⁴⁷ As Droz summarizes, “wind energy is generally incompatible with farming.”⁴⁸

Moreover, studies from independent experts [including wind energy proponents] also demonstrate that wind energy is incompatible with tourism, as ugly, dominating, windmill towers visually despoil vast stretches of rural landscapes.⁴⁹ As Droz notes, over 80% of respondents to surveys say they “would not vacation in an area where a wind facility was visible,” even with over half of respondents saying they support wind energy.⁵⁰

Droz reports that other studies by independent medical professionals conclude that “some nearby citizens will experience adverse health effects” from the droning and churning of the giant windmill towers.⁵¹ Droz explains, “The biggest concern is from infrasound (noise we cannot hear). The World Health Organization has stated that infrasound is more problematic than audible sound. Infrasound can be so harmful that the U.S. military is researching weaponizing it. Over a hundred studies have concluded that there will be health consequences” from nearby giant windmill towers.⁵²

Such infrasound is probably why “property values decrease for residences within 1 mile of a wind project,” as a study by the London School of Economics concluded. That was the largest study in the world on effects of wind energy, just one of many others.⁵³ That was probably also why other independent studies show that “industrial wind projects can adversely affect local hunting (and possibly fishing).”⁵⁴

Other independent studies show that industrial windmill projects can cause major eco-system damage, including harming wildlife and livestock animals,⁵⁵ and serious hydrological consequences.⁵⁶ Windmill projects can even cause serious interference with military facilities.⁵⁷

⁴⁷ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 1.

⁴⁸ *Id.*

⁴⁹ “New Study Shows Near-Shore Wind Farms Are Likely to Negatively Impact Coastal Tourism,” Center for Environmental and Resource Economic Policy, North Carolina State University, February 19, 2016.

⁵⁰ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 1.

⁵¹ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 2.

⁵² *Id.*, “Low frequency noise and human response,” University of Gothenberg, August 16, 2013; Eja Pederson, “Human Response to Wind Turbine Noise – Perception, Annoyance, and Moderating Factors,” Occupational and Environmental Medicine, Department of Public Health and Community Medicine, Institute of Medicine, Goteberg University, 2007; G.P. van den Berg, “Effect Of The Wind Profile At Night On Wind Turbine Sound,” *Journal of Sound and Vibration* 277 (2004): 955–70.

⁵³ “[London School of Economics study finds property value loss near wind power](#),” *Ottawa Wind Concerns* (website), January 26, 2014.

⁵⁴ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 1; Dr. Ileana Johnson Paugh, “Wind Turbines Take Terrible Toll On Animals,” *Canada Free Press*, June 23, 2014.

⁵⁵ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 2; National Research Council, *Environmental Impacts of Wind-Energy Projects* (Washington, DC: The National Academies Press (2007); Clive Hamblen, “[Wind Farms vs Wildlife](#),” *The Spectator*, January 5, 2013; Mark A. Hayes, “[Bats Killed in Large Numbers at United States Wind Energy Facilities](#),” *Bioscience* 63 (2013): 975–9; Dr. Ileana Johnson Paugh, “Wind Turbines Take Terrible Toll On Animals,” *Canada Free Press*, June 23, 2014

This all adds up to serious potential liabilities for leaseholders renting their property out to industrial windmill operators, including up to 40+ possible threats.⁵⁸ This contributes to potential economic losses for leaseholders renting out their land for wind turbines, which can result when the wind dies down for extended times and the turbine does not generate electricity, but still needs maintenance.⁵⁹

But the biggest cost driver for alternative energy from wind and solar is that they are not really an alternative to fossil fuels because the wind does not always blow and the sun does not always shine. Ultimately, the full fossil fuel fleet must be maintained to generate up to 100% of needed energy as a backup to unreliable wind and solar.

This can work more easily for natural gas electric generation, which can be shut on and off without adverse effects. But such “cycling” for coal electricity generation adds even more to costs. When coal fired electricity plants have to be turned off and on, they operate less efficiently, and their emissions control equipment does not work as well. The overall net result is *higher* emissions for sulfur dioxide (SO₂), nitrogen oxide (NO_x) and even carbon dioxide (CO₂). As Droz explains, “[C]oal equipment is not built for cycling. Coal boilers are designed to be operated as a base load resource – in other words, to operate at a consistent output level all the time. Cycling causes coal units to operate less efficiently and reduces the effectiveness of the environmental control equipment, substantially increasing emissions.”⁶⁰

All of which seriously detracts from any net benefit from the use of wind, and solar, as “alternative” energy. All of this needs to be taken into account in any serious, complete, financial, cost-benefit analysis of wind and solar as “alternative” sources of energy.

Droz reports that when this was done in the case of the proposed New York Horse Creek wind project, the conclusion was “that the NET economic impact would likely be a loss of [about] \$10 million a year.”⁶¹ When this was done in the case of the proposed North Carolina Timbermill wind project, “The conclusion [was] that there would be a NET economic loss of [about] \$12 million a year.”⁶²

So before “alternative energy” like wind and solar can be evaluated, for any community, or for the nation as a whole, “a *comprehensive* and *objective* financial analysis **must** be done,” Droz

⁵⁶ “[VCE’s Investigation into the Environmental Health of the Lowell Mountains with Industrial Wind Turbines—July 2016](#),” *Vermonters for a Clean Environment’s Blog*, August 5, 2016; John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 1.

⁵⁷ John Droz, Jr., “U.S. Military v. A Political Fad (Renewable Energy),” Alliance for Wise Energy Decisions, June 5, 2017; John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 2.

⁵⁸ John Droz, Jr., “Easy Money? Some Landowner Considerations: On Wind Energy (and Solar) Contracts,” Alliance for Wise Energy Decisions, August 15, 2015.

⁵⁹ Bentek Energy, [How Less Became More: Wind, Power and Unintended Consequences in the Colorado Energy Market](#), Independent Petroleum Association of Mountain States, April 16, 2010.

⁶⁰ *Id.*, p. 9.

⁶¹ John Droz, Jr., “[Wind Energy: Local Economics 101](#),” Alliance for Wise Energy Decisions, December 27, 2017, p. 2.

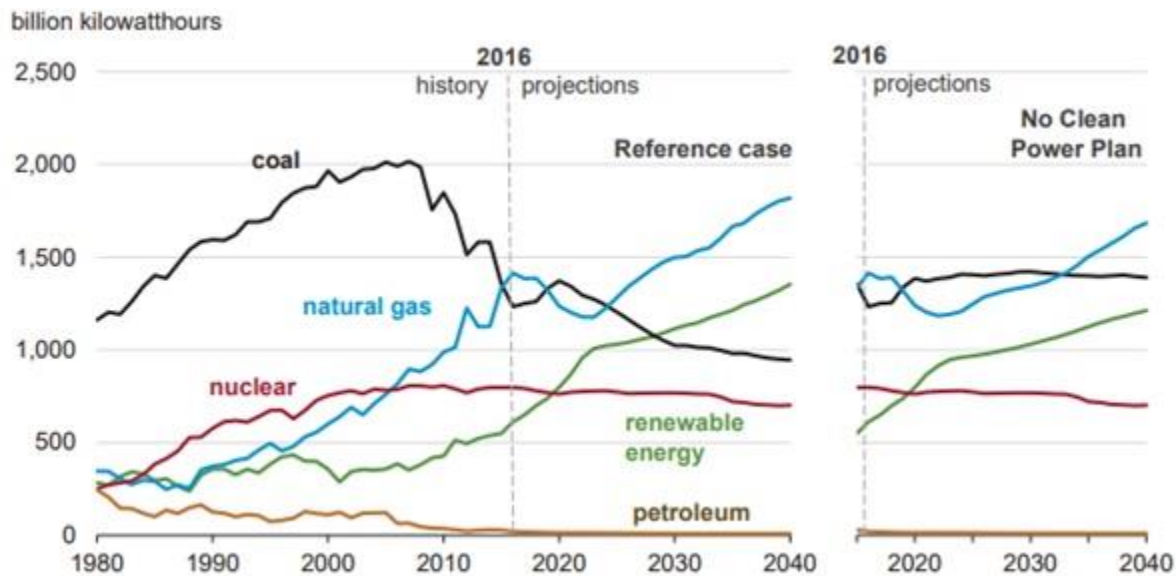
⁶² *Id.*

rightly concludes.⁶³ As Droz reports, “Right now, *no one* in any federal, state or local agency, is thoroughly investigating these wind-energy liabilities.”⁶⁴ But all of this needs to be comprehensively and objectively evaluated before any regulation like the CPP could be said to involve any economic benefit.

C. Official U.S. government projections show fossil fuels will be essential for 50 to 100 years at least.

According to the United States Energy Information Administration, fossil fuels will still be the most important energy sources in the coming decades for the United States, and globally. Fossil fuels will remain the dominant fuel sources under every economic scenario, even those incorporating the CPP into their analysis. Under the no-CPP scenario, natural gas and coal will be the dominant fuel sources for electricity generation, with gains in renewable generation driven primarily by renewable portfolio mandates and federal tax subsidies (see Figure 8).

Figure 8
U.S. Net Electricity Generation from Select Fuels



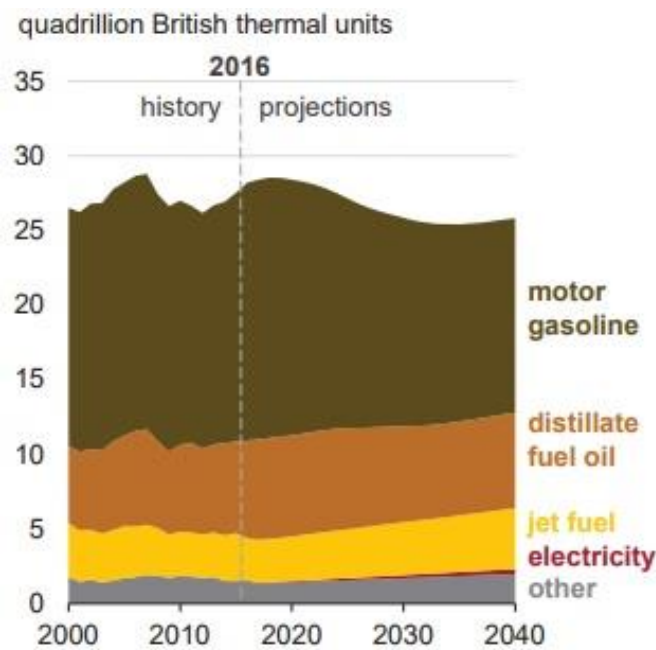
According to EIA’s *Annual Energy Outlook*, growth in renewable energy sources will depend heavily upon the tax credits available to them because these sources of energy are not competitive without them. This makes it more likely that expensive, unpredictable, unreliable renewable sources will account for an even smaller share than either of the scenarios above predict. Source: Adam Sieminski, [Annual Energy Outlook 2017](#), January 5, 2017, page 30.

⁶³ *Id.*

⁶⁴ *Id.*

Additionally, the transportation sector, which accounted for 29 percent of the nation’s energy consumption in 2016, will continue to rely almost exclusively on oil-based fuels for the coming decades, with electric cars constituting a tiny fraction of the American automobile fleet⁶⁵ (see Figure 9). Moreover, any increases in electric vehicles will require even more fossil fuel or nuclear electricity generation, which the Clean Power Plan and other policy restrictions will delay or obstruct.

Figure 9
Transportation Sector Energy Consumption



Source: U.S. Energy Information Administration, “[International Energy Outlook 2017](#),” Executive Summary, September 14, 2017.

EIA projects world energy consumption will grow 28 percent between 2015 and 2040, with most of this growth occurring in developing nations, primarily Asia. EIA projects fossil fuels will account for 77 percent of total energy use in 2040.⁶⁶

Liquid fuels—mostly petroleum-based—are predicted to remain the largest source of world energy consumption, accounting for 31 percent of global energy consumption in 2040. Natural gas is projected to account for 24 percent of energy use and coal, 22 percent.

These projections, particularly those made regarding coal, may be unrealistic, as China and India have continued to aggressively build coal-fired power plants to meet their growing electricity

⁶⁵ U.S. Energy Information Administration, “[Energy Use for Transportation](#),” Energy Explained, May 17, 2017.

⁶⁶ U.S. Energy Information Administration, “[International Energy Outlook 2017](#),” Executive Summary, September 14, 2017.

needs. For example, Chinese companies are building or planning to build more than 700 new coal-fired power plants over the next decade.⁷² Most of those plants will be built in China, but about one-fifth will be built in other countries. All told, some 1,600 coal-fired power plants are planned or under construction in 62 countries worldwide.⁷³ Coal will continue to be the main source of energy for China for decades to come.

Similarly, India’s reliance on coal will persist even in 2047, with a projected share of 42 percent to 50 percent of the energy mix.⁶⁷ India would like to use its abundant coal reserves, which provide a cheap source of energy and ensure energy security as well. However, imports of coal rose at a compound annual growth rate of 18 percent between 2005–06 (39 megatons) and 2015–16 (200 megatons). A modeling exercise conducted by the National Institute for Transforming India (NITI) shows India will achieve peak production of coal in 2037, after which the production will decline and India will depend on imports to meet its energy needs (see Figure 10).

Figure 10
India’s Energy Mix

	2012	2047	
TWh		BAU Scenario	Ambitious Scenario
Nuclear	1%	2%	4%
Renewable Energy	3%	7%	12%
Agriculture/waste	15%	5%	8%
Coal	46%	50%	42%
Oil	27%	28%	23%
Natural gas	8%	8%	10%

Coal will remain the dominant fuel in India for the next 30 years, as the business as usual (BAU) scenario indicated India will derive 50 percent of its energy from coal and only 7 percent from renewable sources. *Source:* Harendra Kumar, *et al.*, “[Energizing India](#),” Joint Project Report of NITI Aayog and IEEJ, June 16, 2017.

Renewables, by contrast, are projected to account for less than 22 percent of total energy consumption worldwide, despite the billions if not trillions of dollars in subsidies that have been provided to these technologies. In addition to accounting for a small overall share of global energy generation, the majority of renewables, 53 percent, will be derived from hydroelectric generating sources, not wind or solar.

⁶⁷ Harendra Kumar, *et al.*, “[Energizing India](#),” Joint Project Report of NITI Aayog and IEEJ, June 16, 2017.

The United States should acknowledge the physical and economic limits of renewable energy sources such as wind and solar and promote affordable, reliable energy by allowing existing coal-fired power plants to continue operation and launch a major effort to bring modern High Efficiency Low Emissions (HELE) coal-fired power plants on line as soon as possible, as is happening in other countries.⁶⁸

Basics physics tells us niche renewables such as wind and solar will never be able to power the modern, twenty-first century global economy. In contrast, fossil fuels have given us unprecedented economic growth and modern prosperity took off when fossil fuels became widely utilized through technological innovation. The Trump administration should repeal the CPP and encourage a rapid expansion in fossil fuel use.

D. Phasing out fossil fuels would amount to a policy of mass poverty for the American people, unless America turns to nuclear power, which is opposed by the same extremists who oppose fossil fuels.

Reversing the fossil fuel revolution to go back to renewables would be a disaster for America and the world. Moore and White explain,

The governments of many of the most developed countries of the world have mandated as rapid a transition as possible from carbon-rich energy to zero-carbon energy like wind, solar, and biomass. The inherent limitations of wind and solar are physically intractable. We are facing a regression to the limited energy horizons of pre-industrial societies. Never before have the rulers of a society intentionally driven it backward to scarcer, more expensive, and less efficient energy ... and raise[d] prices for financially strapped families.⁶⁹

Michael Kelly, a fellow of the Royal Society of the United Kingdom, adds, “A decarbonized global economy is going to have to outperform the achievement of fossil fuels. If not, mankind’s progress will have to go in reverse in terms of aggregate standard of living. We should be honest and upfront about the sheer scale and enormity of the challenge implied by decarbonization.”⁷⁰

Moore and White elaborate that those who benefitted the most from the booming economic growth of the Industrial Revolution were the poorest of the poor, forgotten at the bottom of pre-enlightenment, pre-industrial, medieval times. They write,

Those who have gained the most from that growth have not been the wealthiest but the poorest. With the Industrial Revolution, ... “[f]or the first time the economy performed for the People instead of mainly for the Privileged.” From the beginning, it was not the aristocracy, clerisy, warrior class, or industrial titans

⁶⁸ U.S. Energy Information Administration, “[International Energy Outlook 2017](#),” September 14, 2017.

⁶⁹ Stephen Moore and Kathleen Hartnett White, *Fueling Freedom: Exposing the Mad War on Energy*, *supra* note 13, p. xv.

⁷⁰ *Id.* at p. 7.

who gained the most, but the average worker and the most impoverished. No longer was intractable poverty the common lot of mankind. An enduring middle class emerged. The historian Robert Fogel concludes that “the average real income of the bottom fifth of the [American] population has multiplied some twenty fold [over the twentieth century], several times more than the gain realized by the rest of the population.”⁷¹

Moore and White offer this example: “In 1875, the average American family spent 74 percent of its income on food, clothing and shelter, not unlike the rest of the world. In 1995, the same American family spent 13 percent of its income on these fundamental necessities.”⁷²

If Kelly is right and the aggregate standard of living would drop dramatically in a green economy, what does that mean for working people, the middle class, and the poor? Moore and White explain,

Most green policies undermine human progress. They are regressive, disproportionately hurting low and middle income families by driving energy prices higher, thus eroding their standard of living. As the Obama Administration was drawing to a close, the lower end of middle class income in the United States appeared to be sliding toward the poverty level. Numbers revealed by the Social Security Administration in the fall of 2015 show that 51 percent of all U.S. workers were making less than \$30,000 a year—only \$2,500 a month after taxes. Income for middle class families declined by 3 percent on Obama’s watch, and the average worker went ten years without a raise.⁷³

Moore and White directly implicate the CPP in that regard,

The [CPP] is futile—all pain and no gain. By EPA’s own admission, the mandated carbon cuts will not meaningfully reduce predicted warming. Gina McCarthy, the Administrator of the EPA, justifies it as a gesture of sacrifice by the wealthiest country in the world. Americans should embrace economic decline for its symbolic value? Even before the Clean Power Plan took effect, many coal fired power plants had closed and major power companies had declared bankruptcy, at a cost of thousands of jobs. In response, President Obama, by executive action, froze coal production on federal lands, where 40 percent of total U.S. production is located. The Left’s strategy is to make American coal so expensive that the industry cannot survive in global markets. The environmentalists want an utterly debilitating “production tax” of as much as \$40 per ton. ... Obama [chose] “to pander to special interest groups whose stated goal is to shut down the U.S. coal industry”—and the economies of our coal producing states—Illinois, Ohio, Kentucky, Pennsylvania, West Virginia, Wyoming and West Virginia—be damned.⁷⁴

⁷¹ *Id.*, pp. 7–8.

⁷² *Id.*, p. 8.

⁷³ *Id.*, pp. 8–9.

⁷⁴ *Id.*, p. 9.

Those coal-producing states are among the former Democrat states that flipped to Donald Trump in the November 2016 election, putting him in the White House. Moore and White conclude,

President Obama and some leaders of the wealthiest countries in the world are adamant about phasing out fossil fuels when there are no *alternative energy sources* capable of providing the countless goods and services that fossil fuels make possible. Modern societies remain utterly dependent on fossil fuels. ... The climate crusade is indeed a mad war on human welfare.⁷⁵

Even worse, eliminating fossil fuels will not only raise prices for energy, goods, and services for poor and middle-class families, making them increasingly poor and marginalized. Eliminating fossil fuels will greatly increase energy prices for factories and other businesses, including hospitals and schools, destroying millions of jobs for those very same blue-collar families, and driving more and more people onto welfare rolls. At the same time, local, state, and federal governments will have less and less tax revenue to pay for welfare, because the entire U.S. economy will be driven into a downward death spiral. Millions of American families will see their living standards, health, welfare, and life spans decline precipitously, for no climate or environmental benefit whatsoever.

As Bjorn Lomborg noted in January 2018 for *The Wall Street Journal*,⁷⁶

Freezing temperatures in the U.S. Northeast have pushed up heating costs, creating serious stress for many Americans. Although the rich world's energy poor are largely forgotten in discussions about climate policies, they bear an unfair burden for well-meaning proposals. That reality is being laid bare this icy winter as energy and electricity prices surge.

When we think about energy poverty, we imagine a lack of light in the world's worst-off nations, where more than one billion people still lack electricity. This is a huge challenge that the world can hope to address as it reduces poverty and expands access to grid electricity, largely powered by fossil fuels.

But there is a less visible form of energy poverty that affects even the world's richest country. Economists consider households energy poor if they spend 10% of their income to cover energy costs. A recent report from the International Energy Agency shows that more than 30 million Americans live in households that are energy poor—a number that is significantly increased by climate policies that require Americans to consume expensive green energy from subsidized solar panels and wind turbines.

Moore and White describe the fundamental economic choice this frames: economic growth or economic decline:

⁷⁵ *Id.*, p. 10.

⁷⁶ Bjorn Lomborg, "[Climate-Change Policies Can Be Punishing for the Poor](#)," *The Wall Street Journal*, January 5, 2018.

The contrast between these two forces is stark and simple. The shale energy boom increased the economic pie. Taxpayer subsidized green energy shrinks the economic pie. The kind of economic growth we take for granted in the modern world would have been impossible if we had been limited to sources of energy that depend on taxpayer subsidies. Climate policies to decarbonize human society augur energy scarcity, exponentially higher prices for basic goods, loss of personal freedoms, and an end to the prosperity achieved in the twentieth century that has lifted billions out of grinding poverty.⁷⁷

III. Continued Use of Fossil Fuels Will Produce an American Economic Boom, Creating Millions of New Jobs and Restoring Rising Real Wages for the Middle Class and Blue Collar Workers.

A. America has the natural resources to be the world's no. 1 producer of oil, no. 1 producer of coal, and over the near future, the no. 1 producer of natural gas, achieving energy dominance.

The United States has an abundance of fossil fuel resources that give it distinct geopolitical and economic advantages. In fact, the United States has more energy resources than any other nation on Earth. Only one nation, Russia, has even half as many energy resources as the United States. The United States truly has an opportunity to become energy dominant, but to do so, it must repeal the CPP.

Among these fossil fuel resources, the most abundant is coal. America has the largest coal reserves in the world, capable of meeting U.S. demand for 381 years.⁷⁸ In addition to its abundance, coal is an energy source that is more resistant to price shocks and the manipulation of foreign markets than any other fuel. The United States also has the largest oil reserves in the world, with more recoverable oil reserves than either Saudi Arabia or Russia.⁷⁹ Lastly, the United States is currently the largest producer of natural gas in the world. Although the U.S. has only 4% of world gas reserves, the U.S. Energy Information Administration estimates current natural gas supplies are large enough to last for nearly 100 years at current rates of consumption.⁸⁰

Giving up on those abundant energy resources would involve the largest opportunity cost literally in world history.

⁷⁷ Stephen Moore and Kathleen Hartnett White, *Fueling Freedom: Exposing the Mad War on Energy*, *supra* note 13, p. 11.

⁷⁸ J.M. Leimkuhler, "[Can the U.S. Dominate Energy?](#)" keynote presentation, America First Energy Conference, November 9, 2017. Original source is "[BP Statistical Review of World Energy 2017](#)."

⁷⁹ Per Magnus Nysveen, "[United States Now Holds More Recoverable Oil than Saudi Arabia](#)," Rystad Energy, July 04, 2016.

⁸⁰ U.S. Energy Information Administration, "[How Much Natural Gas Does the US have, and How Long will it Last?](#)" accessed July 24, 2017.

Under the previous administration, these resources were treated as liabilities, rather than assets. This will change under the Trump administration. By focusing on environmentally responsible development of domestic energy resources, thereby ensuring the United States has abundant access to affordable energy, federal and state policymakers will be taking a concrete step toward reviving the American economy and putting Americans first.

Indeed, to have the world's leading oil industry, the world's leading natural gas industry, and the world's leading coal industry all in one economy would restore the American economy to world leadership and would reinvigorate the American Dream that has inspired the world for three centuries. Giving up on these abundant energy resources in the name of stopping hypothetical anthropogenic global warming would be madness.

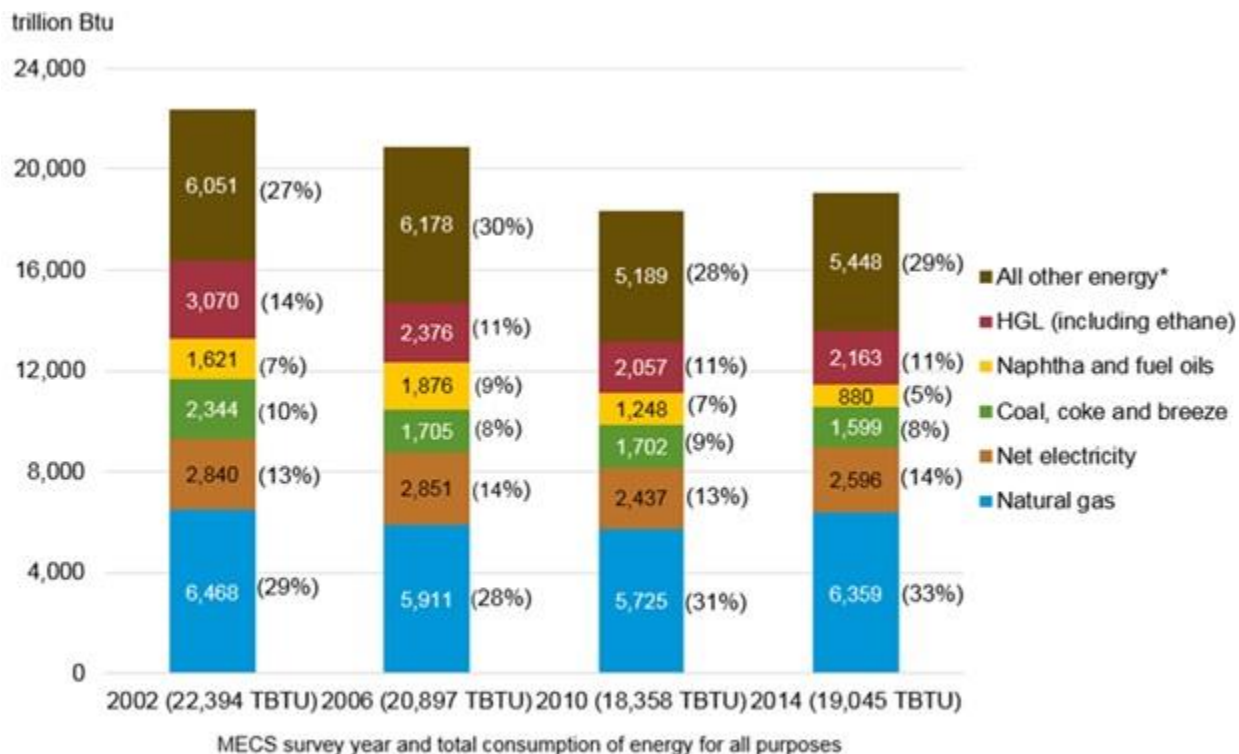
B. That virtually unlimited supply of reliable, low-cost energy will bring manufacturing back to the United States, a process that has already begun.

President Trump has made increasing manufacturing in the United States a key goal of his presidency. That effort will be severely hampered if manufacturers and businesses do not have access to affordable energy resources, particularly oil, natural gas, and electricity. These make up the largest components of energy used by industry in the United States (see Figure 11).

If the CPP is not withdrawn, energy prices will increase because: 1) Coal-fired electricity generation will continue to decline, sharply increasing electricity prices, and 2) increasing use of natural gas for electricity generation will put upward price pressure on natural gas prices. The impact on manufacturing, manufacturing jobs and salaries, and America's heartland will be profound.

Prematurely shuttering existing coal-fired power plants would further increase electricity prices because existing power plants can generate electricity more affordably than new power plants can. This is because existing plants have already paid off much of the up-front capital and financing costs, meaning they are able to reduce their prices and still make a profit on the electricity they sell (see Figure 12).

Figure 11
Manufacturing Energy Consumption Has Increased
for the First Time Since 2002

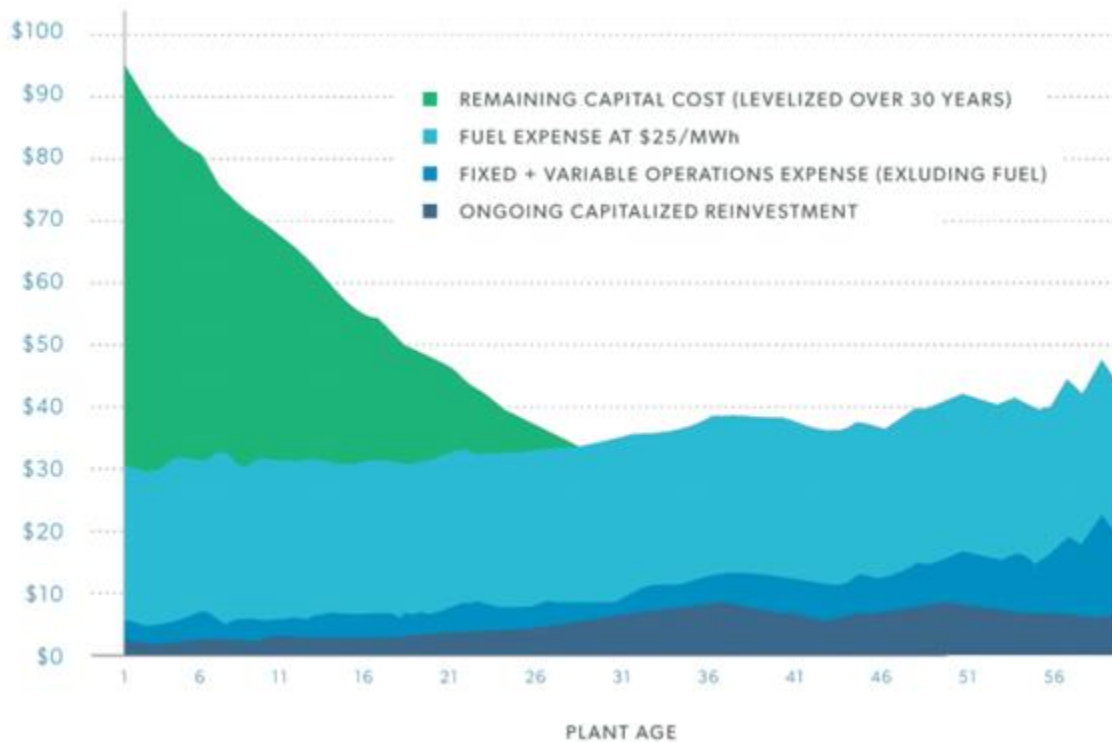


Source: U.S. Energy Information Administration

* Shipments were subtracted from all other energy.

Natural gas accounted for the largest share of energy used by industry in 2014, at 33 percent. Electricity accounted for the second largest primary or secondary source of energy at 14 percent, followed by coal and oil. "All other energy" represents a combination of technologies such as heat capture, waste re-use, and other energy efficiency measures. *Source:* U.S. Energy Information Administration, "[Manufacturing Energy Consumption Survey](#)," October 13, 2016.

Figure 12
LCOE from Coal in 2012 \$/MWh by Plant Age
30-Year Outlook

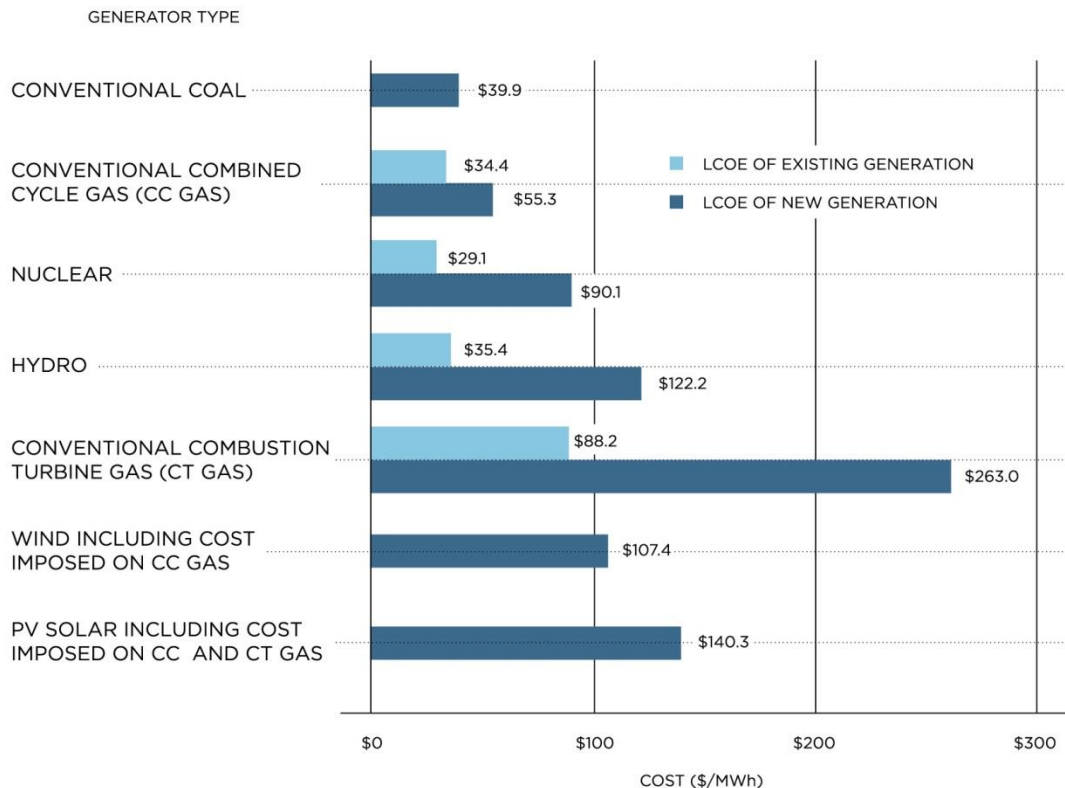


Analyses of the changes in going-forward costs for both coal and nuclear plants show these costs increase by less than 1 percent per year over the observed age distribution of existing plants. At an average age of 38 years, the typical existing coal-fired power plant will likely not be economic to retire and replace for another decade or more. Source: Tom Stacy and George Taylor, [The Levelized Cost of Electricity from Existing Generation Resources](#), Institute for Energy Research, July 2016, page 22.

Electricity generation from existing natural gas, coal, nuclear, and hydro power is significantly less expensive than new generating resources. In many cases, existing electricity resources can generate electricity for one-third of the cost of new wind power and one-quarter of the cost of new solar. For example, Stacey and Taylor say existing coal-fired power plants generate reliable electricity at a cost of \$39.9 per megawatt-hour on average, existing nuclear for \$29.1/MWh, natural gas \$34.4/MWh, and hydroelectric resources for \$35.4. Each of these resources is about one-third of the cost of new wind resources, which generate electricity at a cost of \$107.4/MWh (see Figure 13).⁸¹ So, less reliable renewable energy costs three times as much as reliable conventional energy.

⁸¹ Tom Stacy and George Taylor, [“The Levelized Cost of Electricity From Existing Generation Resources,”](#) Institute for Energy Research, July 2016.

Figure 13
Levelized Cost of Electricity



Electricity generation from existing natural gas, coal, nuclear, and hydro power is significantly less expensive than new generating resources. In many cases, existing electricity resources can generate electricity for one-third of the cost of new wind power and one quarter of the cost of new solar. *Source: Tom Stacy and George Taylor, [The Levelized Cost of Electricity from Existing Generation Resources](#), Institute for Energy Research, July 2016, page 5 (text color modified for readability).*

The lowest possible electricity rates will be achieved only by keeping existing generating resources in operation until their product becomes uneconomic compared to the cost of replacing them.⁸²

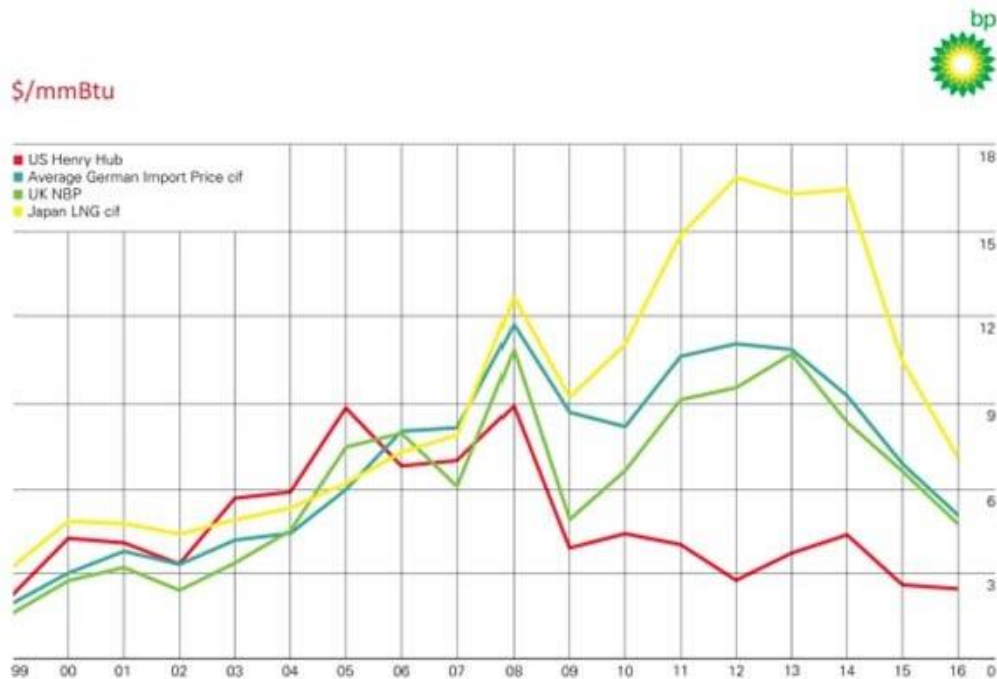
The manufacturing and industrial sectors of the economy accounted for approximately one-third of total energy consumption in the United States in 2015.⁸³ The cost of energy is one of the largest expenses (second only to labor costs) for energy-intensive businesses such as steelmaking, fertilizer production, cement making, aluminum processing, and plastics and other manufacturing.

⁸² *Id.*

⁸³ National Academies of Science, Engineering and Medicine, "[How We Use Energy](#)," accessed July 30, 2017.

Revolutionary improvements in horizontal drilling technology and exploration technology, combined with increased use of hydraulic fracturing (a proven technique more than 70 years old), led to a natural gas boom. As a result, the United States has the lowest natural gas prices of any developed nation, which gives American firms a distinct advantage when competing against foreign firms in the global marketplace (see Figure 14). This advantage has already begun to produce a significant renaissance in American manufacturing.

Figure 14
Gas Prices Worldwide



Natural gas prices in the United States are significantly lower than in other industrialized nations because hydraulic fracturing has made the United States the largest producer of natural gas in the world. Although the price differential between the U.S. and the world has declined in the most recent years due to larger supplies of liquid natural gas, large differences are estimated to persist for the foreseeable future. *Source:* BP Global, “[Natural Gas Prices](#),” BP Statistical Review, accessed July 30, 2017.

Industries differ significantly in their inherent technological energy intensities. For example, energy represents around 10 percent of the overall input costs for chemical manufacturing and primary metal manufacturing, while energy represents less than 5 percent of the input costs for the nondurable consumer goods sector.⁸⁴ Overall, manufacturing tends to be energy-intensive.

⁸⁴ Rabah Arezki, “[Fracking Has Made U.S. Manufacturing More Competitive](#),” *The London School of Economics and Political Science*, December 16, 2016.

The reduction in energy costs has already begun to attract energy-intensive companies to the United States. For example, low natural gas prices are one reason Austrian steel firm Voestalpine, Japanese oil refiner Idemitsu Kosan, and trading house Mitsui & Co. have opened operations in the United States.⁸⁵ In 2015 alone, lower energy prices generated an estimated \$47 billion in new economic opportunity, nearly \$25 billion in labor income, and the equivalent of 387,500 jobs.⁸⁶

Gains in investment and job creation are expected to accelerate in the coming years. The American Chemical Society recently announced the chemicals industry will invest more than \$130 billion in the coming decade and create roughly 462,000 new jobs.⁸⁷ A PricewaterhouseCoopers report found the annual cost savings from low natural gas prices could spur the creation of nearly a million manufacturing jobs by 2030 and 1.41 million jobs by 2040.⁸⁸

In contrast, the International Energy Agency estimates Europe will *lose* one-third of its global market share of energy-intensive exports over the next two decades, because European energy prices will stay consistently higher than U.S. energy prices. For example, European gas import prices are significantly higher than they are in the U.S., while industrial electricity prices are about twice as high, creating an energy price gap some experts expect to last “at least 20 years.”⁸⁹

Low energy prices provide a large competitive advantage to American manufacturing firms and other energy-intensive industries. Energy policies that prioritize domestic production, including coal, oil, and natural gas, truly put “America first” in both a tangible and metaphorical sense, with the resulting investments creating hundreds of thousands of advanced, well-paying, manufacturing jobs.

C. The resulting American economic renaissance would ultimately eliminate poverty in America.

With the world-leading oil industry, the world-leading natural gas industry, and the world-leading coal industry all in one economy, America is now poised to finally win the War on Poverty after all these years, virtually eliminating poverty in America. After all, a good-paying job is the world-leading solution for poverty, especially if welfare and education policies and also reformed.

President Trump has already reignited American economic growth, which over the past year has increased by more than 50 percent from the stagnant, less-than-2 percent real annual growth

⁸⁵ [“Shale Boom Sparks U.S. Industrial Revival,”](#) CNBC, March 26, 2013.

⁸⁶ U.S Chamber of Commerce Institute for 21st Century Energy, [“What if America’s Energy Renaissance Never Actually Happened?”](#) September 22, 2016.

⁸⁷ Id.

⁸⁸ Beth Gillin, [“Shale Gas Provides Major Boost to US Manufacturing,”](#) PricewaterhouseCoopers Business Advocate, January 10, 2015.

⁸⁹ Pilita Clark, [“Energy Price Gap with the US to Hurt Europe for ‘At Least 20 Years,’”](#) *Financial Times*, January 29, 2014.

averaged by President Barack Obama over his eight years in office. The stock market, widely regarded as a leading economic indicator, set all-time high records during Trump's first year, portending further, even faster growth to come.

That growth was achieved largely as a result of President Trump's deregulation and expected tax reforms that have now been enacted. The extension of that success through the repeal of the CPP will liberate America for energy dominance, booming economic growth, job creation, and rapidly declining poverty.

Under current U.S. law, any full-time job will eliminate poverty for a family. The minimum wage, plus the Earned Income Tax Credit, plus the child tax credit, equals or exceeds the poverty line for every possible family combination, including single parents with one or more children.⁹⁰

Further, the tax reform measure just approved by Congress and signed by President Trump will stimulate the economy to even faster growth, achieving the long-overdue full recovery from the 2008–09 recession.⁹¹ That will mean even more good-paying jobs and faster elimination of poverty in America. That tax reform doubled the child tax credit, which will be seen in the future as one of the most powerful anti-poverty measures ever adopted.

IV. Carbon Dioxide Emissions from Continued Use of Fossil Fuels Pose No Threat of Catastrophic Global Warming.

A. Carbon dioxide (CO₂) cannot be considered “pollution.” It is essential to plant photosynthesis and is a beneficial substance produced by the natural environment. *Massachusetts v. EPA* was wrong to decide it is an air pollutant and so authorize EPA to create global warming regulation under the Clean Air Act.

In [*Massachusetts v. Environmental Protection Agency*](#), 549 US 497 (2007), the U.S. Supreme Court ruled in favor of plaintiffs who argued human carbon dioxide emissions met the technical definition of a “pollutant” under the Clean Air Act.⁹² As late as December 18, 2008, after the election of Barack Obama but before he assumed office, EPA itself held the position that the science did *not* support a finding that carbon dioxide emissions posed a threat to public health or welfare.⁹³

President Trump's efforts to end Obama's war on coal may come to naught unless he instructs EPA to rescind its 2009 “Endangerment Finding” against CO₂, the foundation for the Clean Power Plan and many other rules and regulations that cripple the energy sector, coal most of all.

⁹⁰ Peter J. Ferrara, [*Power to the People: The New Road to Freedom and Prosperity for the Poor, Seniors, and Those Most in Need of the World's Best Health Care*](#) (Arlington Heights, IL: The Heartland Institute, 2015).

⁹¹ Peter J. Ferrara, [“Why the United States Has Suffered the Worst Economic Recovery Since the Great Depression,”](#) *Policy Brief*, The Heartland Institute, August 1, 2016.

⁹² Oyez, [“*Massachusetts v. Environmental Protection Agency*”](#) (website), accessed April 11, 2017.

⁹³ David A. Fahrenthold and Steven Mufson, [“EPA Eases Emissions Regulations for New Power Plants,”](#) *Washington Post*, December 19, 2008.

If that foundation is not removed, future administrations could reinstate of the Obama-era CO₂-focused regulations.⁹⁴

The online summary of EPA's Endangerment Finding reads:

The Administrator finds that six greenhouse gases taken in combination *endanger both the public health and the public welfare of current and future generations*. The Administrator also finds that the combined emissions of these greenhouse gases from new motor vehicles and new motor vehicle engines *contribute to the greenhouse gas air pollution that endangers public health and welfare under CAA section 202(a)*. These Findings are based on careful consideration of the full weight of scientific evidence and a thorough review of numerous public comments received on the Proposed Findings published April 24, 2009 (emphasis added).⁹⁵

Because EPA decided greenhouse gases, including CO₂, endanger human health, the agency has some authority under the Clean Air Act (CAA) to regulate those gases.

CO₂ is a naturally occurring gas that makes up only .04 percent by volume, or 400 parts per million, of the atmosphere. In other words, there are about 400 CO₂ molecules in the air for every 1,000,000 gas molecules in our atmosphere. Only about 3 percent of that tiny amount is generated by human activities, with the rest coming from natural sources. In 2003, EPA determined “Congress has not granted EPA authority under the Clean Air Act to regulate CO₂ and other greenhouse gases for climate change purposes” and “setting GHG emission standards for motor vehicles is not appropriate at this time.”⁹⁶

Carbon dioxide is essential to the survival of all life on the planet. Without carbon dioxide in the atmosphere, plants would die. Without plants, there would be no food for animals, including humans. This is why it is nonsensical to call carbon dioxide “pollution,” and why *Massachusetts v. EPA* was wrongly decided.

But Obama saw in the Endangerment Finding a way to “weaponize” EPA against the coal industry. Immediately after taking office in 2009, he put EPA to work supporting rather than opposing the plaintiffs in *Massachusetts v. EPA*. His administration overruled decades of science and bipartisan policy and ignored or tried to refute the comments and testimony of hundreds of experts⁹⁷ and even EPA's own staff.⁹⁸ On December 15, 2009, less than a year after Obama was

⁹⁴ Isaac Orr and Fred Palmer, “How to Prevent the Premature Retirement of Coal-Fired Power Plants,” *Policy Study* No. 148, The Heartland Institute, February 2018.

⁹⁵ Environmental Protection Agency, “[Final Rule, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202\(a\) of the Clean Air Act](#),” *Federal Register* 74, p. 66,496, December 15, 2009.

⁹⁶ Environmental Protection Agency, “[EPA Denies Petition to Regulate Greenhouse Gas Emissions from Motor Vehicles](#),” news release, August 28, 2003, accessed November 16, 2017.

⁹⁷ For a collection of some of the testimony present opposing the endangerment finding, see Tim Benson, “[Comments, Petitions, and Testimony Opposing the Endangerment Finding](#),” January 17, 2017, The Heartland Institute, accessed November 16, 2017.

⁹⁸ Alan Carlin, “[Proposed NCEE Comments on Draft Technical Support Document for Endangerment Analysis for Greenhouse Gas Emissions Under the Clean Air Act](#),” Office of Policy, Economics and Innovation- Environmental Protection Agency, March 9, 2009.

sworn into office, EPA used the Endangerment Finding to designate carbon dioxide a pollutant in need of regulation.⁹⁹

This gave the Obama administration the tool to justify dozens of regulations aimed at destroying the coal industry. It also has become a factor in infrastructure and natural resource permitting decisions affecting oil and natural gas exploration, production, pipelines and exports. Federal courts have ruled regulatory agencies such as the Federal Energy Regulatory Commission (FERC) and Bureau of Land Management (BLM) did not properly evaluate whether permitting pipelines or approving the extension of coal mining leases would contribute to greenhouse gas emissions.^{100,101} Such rulings have a chilling effect on infrastructure projects and permits for natural resource development, as environmental groups use the Endangerment Finding to delay or stop these projects.

The Trump administration will have little long-term success in promoting “clean and safe development of our Nation’s vast energy resources,” while at the same time avoiding regulatory burdens that “unnecessarily encumber energy production, constrain economic growth, and prevent job creation,”¹⁰² *unless it can rescind the Endangerment Finding*. The good news is that there are ample legal, scientific, health, and welfare grounds for such action.

B. If the CPP had been fully implemented, it likely would have increased the cost of electricity to American consumers by a factor of five or more, costing businesses and consumers hundreds of billions and ultimately trillions of dollars each year.

The CPP would have increased the cost of electricity because it required the retirement of low-cost coal-fired power plants, dictating that natural gas and renewable energy sources replace them. As discussed earlier, new wind generation resources cost 2.5 times and solar costs 3.5 times more than existing coal-fired power plants.

Furthermore, the Obama administration counted the “energy efficiency” results of its rule as an avoided cost, resulting in a cost estimate considerably lower than it would have been if the administration used the appropriate practice of considering these effects as benefits, rather than subtracting them from costs.¹⁰³

⁹⁹ Environmental Protection Agency, “[Final Rule, Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202\(a\) of the Clean Air Act](#),” *Federal Register* 74, p. 66,496, December 15, 2009.

¹⁰⁰ Robert Walton, “[DC Circuit Rejects FERC Approval of Southeast Pipeline Project Over Climate Concerns](#),” *Utility Dive* (website), August 23, 2017.

¹⁰¹ Barbara Grzincic, “[U.S. Failed to Consider Climate in Mine Lease Extensions- 10th Circuit](#),” Reuters, September 15, 2017.

¹⁰² President Donald Trump, “[Presidential Executive Order on Promoting Energy Independence and Economic Growth](#),” March 28, 2017.

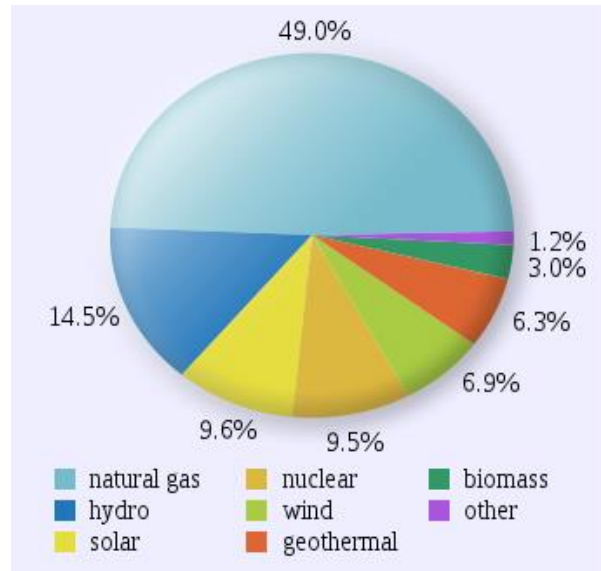
¹⁰³ U.S. Environmental Protection Agency, “[EPA Takes Another Step To Advance President Trump’s America First Strategy, Proposes Repeal Of “Clean Power Plan.”](#)” news release, October 10, 2017.

NERA Economic Consulting estimated the CPP rules would cost dramatically more than the administration’s estimate: between \$29 billion and \$39 billion per year.¹⁰⁴ That adds up to more than a quarter-trillion dollars over a standard 10-year federal budget-planning window. NERA also estimated CPP regulations would have caused electricity bills to increase between 11 percent and 14 percent per year. That would have caused electricity costs to double every five to seven years. After 15 to 21 years, electricity costs would have grown by eight times. Other studies also concluded EPA’s official cost estimates were unrealistically low.¹⁰⁵

Evidence from California demonstrates electricity prices would have necessarily increased as states responded to the CPP by moving away from coal toward increasing amounts of renewable energy generation. California utilities are under a mandate to produce 50 percent of their electricity from “clean energy”—by which state policymakers mean greenhouse-gas-free energy—by 2030, and some lawmakers want the mandate raised to 100 percent by 2045. The state also places severe restrictions on CO₂ emissions and forces companies to buy permits to emit greenhouse gases into the atmosphere.

From 2006 through July 2016, 34,600 MW of capacity from imported and in-state coal-fired power plants were removed from California’s resource portfolio.¹⁰⁶ As shown in Figure 15, in 2016 the state produced 49 percent of its electricity from natural gas. California will shutter its last nuclear power plant, the Diablo Canyon facility, in 2025, and nuclear power’s share will fall from its current 9.5 percent to zero as a result.

Figure 15
Sources of Electricity Generation in California (2016)



Electricity generated in California is primarily derived from natural gas due to its low cost, availability, and ability to quickly start generating electricity when intermittent sources such as wind and solar are not generating power. Data from California Energy Commission. *Source:* Tom Stacy and George Taylor, [The Levelized Cost of Electricity From Existing Generation Resources](#), Institute for Energy Research, July 2016.

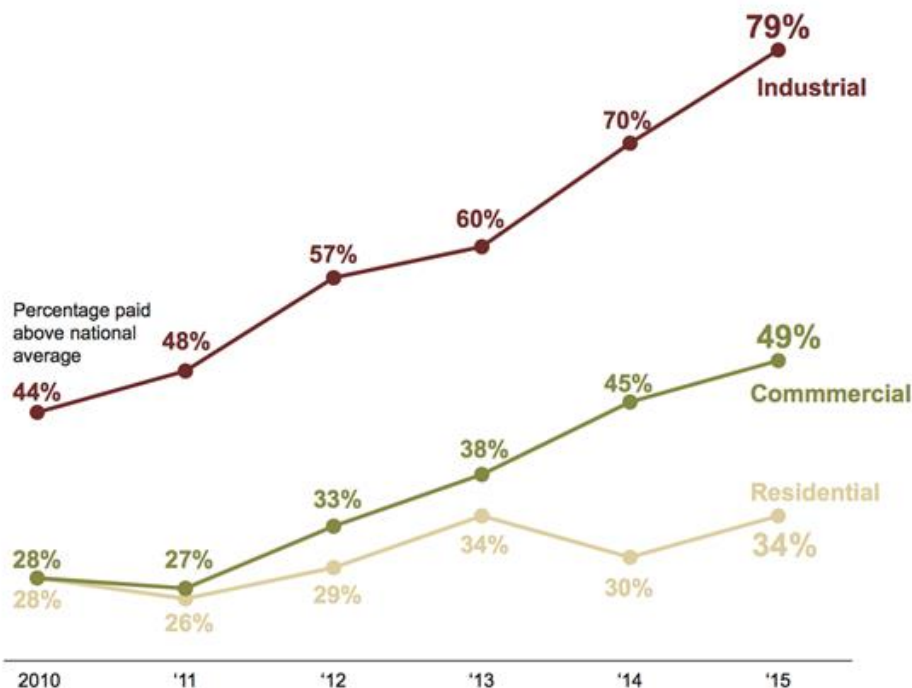
¹⁰⁴ NERA Economic Consulting, “[Energy and Consumer Impacts of EPA’s Clean Power Plan](#),” *Insight in Economics*, November 7, 2015.

¹⁰⁵ Jonathan A. Lesser, [Missing Benefits, Hidden Costs, The Cloudy Numbers in the EPA’s Proposed Clean Power Plan](#), The Manhattan Institute, June 2016; Kevin Dayaratna, “[The Economic Impact of the Clean Power Plan](#),” Testimony before the Committee on Science, Space and Technology, The Heritage Foundation, June 24, 2015.

¹⁰⁶ California Energy Commission, [Actual and Expected Energy From Coal in California](#), November 3, 2016.

The harm caused by California’s anti-coal, pro-wind and pro-solar policies already is apparent. Electricity prices in California have risen dramatically since 2010, far exceeding the national average.¹⁰⁷ (See Figure 16.)

Figure 16
California Electricity Cost Premiums Since 2010



Source: U.S. Energy Information Administration data, graphic created [by California Manufacturers & Technology Association](#), June 1, 2017.

High electricity prices are partially due to poor planning, causing the state to build too many power plants—500 power plants from 2001 to 2016—and partially due to feed-in tariffs, subsidies provided to renewable generators that guarantee renewable energy resources are compensated at above-market rates. The higher costs associated with these feed-in tariffs are passed along to consumers, including families, factories, farms, hospitals, and schools.¹⁰⁸

California is already projected to have 21 percent more electricity generating capacity than it needs to satisfy projected consumer demands by the year 2020. This excess capacity is *not* a

¹⁰⁷ U.S. Energy Information Administration data, graphic created [by California Manufacturers & Technology Association](#), June 1, 2017.

¹⁰⁸ U.S. Energy Information Administration, “[Feed-In Tariff: A Policy Tool Encouraging Deployment of Renewable Electricity Technology](#),” *Today in Energy*, May 30, 2013.

good thing for the power grid.¹⁰⁹ Continued investment in renewable generation continues to oversupply the California markets with intermittent, unreliable electricity priced much higher than electricity in the rest of the country.¹¹⁰ Moreover, wind and solar require vastly more land area and gas-fired backup generators, thus using far more raw materials than are needed for coal or gas only. Wind and solar exact massive death tolls on important, rare, threatened and endangered species.

California's experience with rising electricity prices due to increasing reliance on renewable energy has been seen around the world, as shown in Figure 17. Researcher Willis Eschenbach analyzed electricity costs in countries around the world as a function of per-capita installed renewable (wind and solar only) capacity. His calculations show "Per-capita installed renewable capacity by itself explains 84% of the variation in electricity costs across countries."¹¹¹

C. Even EPA's own climate models show the Clean Power Plan would have a negligible effect on climate, meaning CPP cannot possibly survive any valid cost-benefit analysis.¹¹²

EPA is required by law to provide scientific and economic justifications for the rules and regulations it imposes. EPA's Technical Support Document for the Endangerment Finding was largely based on temperature *estimates* (not observations) derived from computer-based climate *models* (not observations) contained in the Fourth Assessment Report (AR-4) published in 2007 by the United Nations' Intergovernmental Panel on Climate Change (IPCC), and based on the assumption that rising atmospheric CO₂ levels will rapidly increase planetary warming. EPA is required under a separate statutory responsibility to demonstrate the objectivity of the scientific and technical information upon which it based its finding.¹¹³ The agency did not do this; rather, it relied on mere appeal to IPCC's presumed authority.

¹⁰⁹ Isaac Orr and Fred Palmer, "Public Policy and Coal-Fired Power Plants," *Policy Study* No. 147, The Heartland Institute, February 2018.

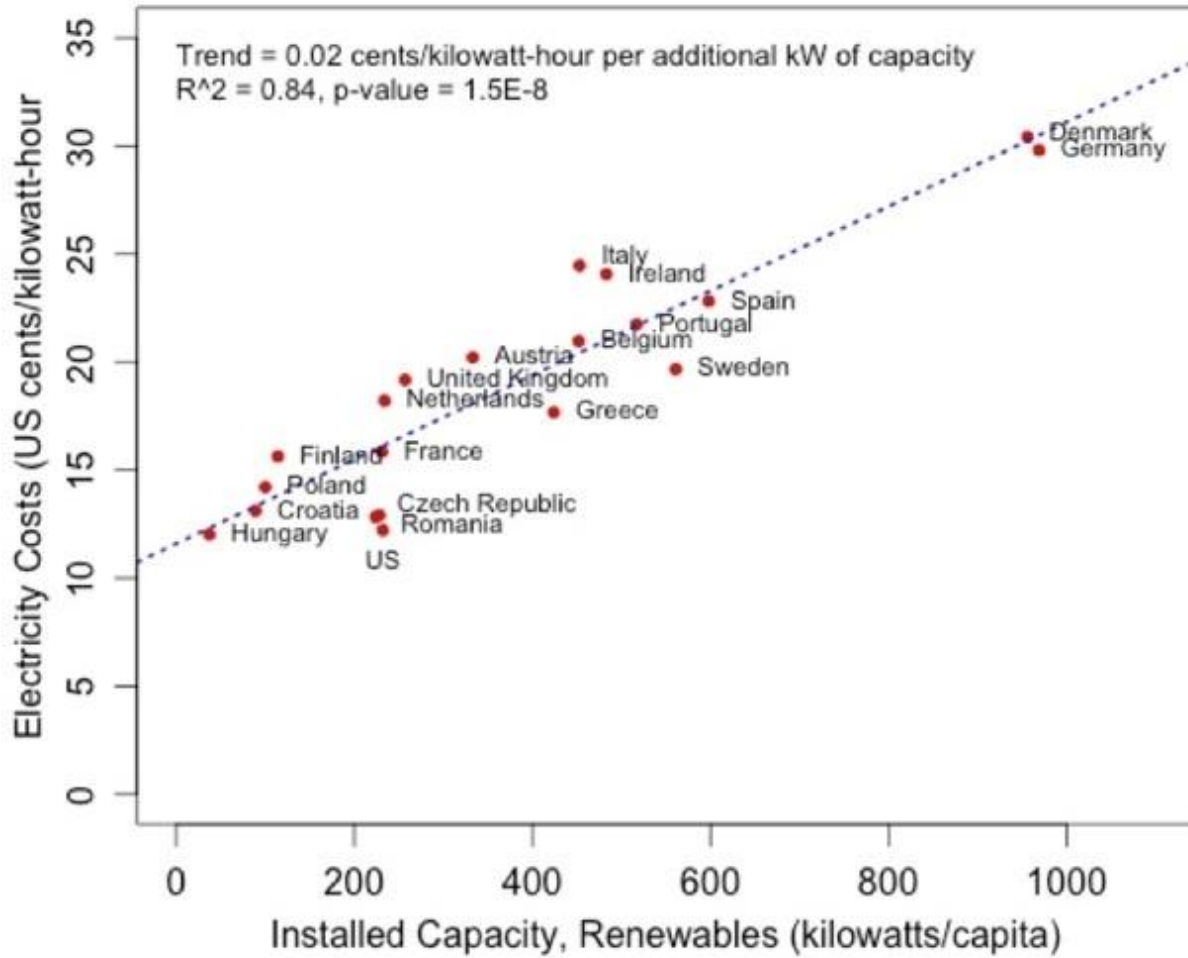
¹¹⁰ Ivan Penn and Ryan Menezes, "[Californian's Are Paying Billions For Power They Don't Need](#)," *The Los Angeles Times*, February 5, 2017.

¹¹¹ Willis Eschenbach, "[Obama May Finally Succeed!](#)" *Watts Up With That* (blog), August 3, 2015.

¹¹² This discussion is reprinted with permission from Isaac Orr and Fred Palmer, "How Obama-Era Regulations Are Shutting Down Perfectly Good Power Plants," *Policy Study* No. 146, The Heartland Institute, November 2017.

¹¹³ Office of Management and Budget, "Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies; Notice, Republication," *Federal Register* 67, No. 36 (February 22 2002): 8452-60; U.S. Environmental Protection Agency, "Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by the Environmental Protection Agency" (EPA/260R-02-008), 2002.

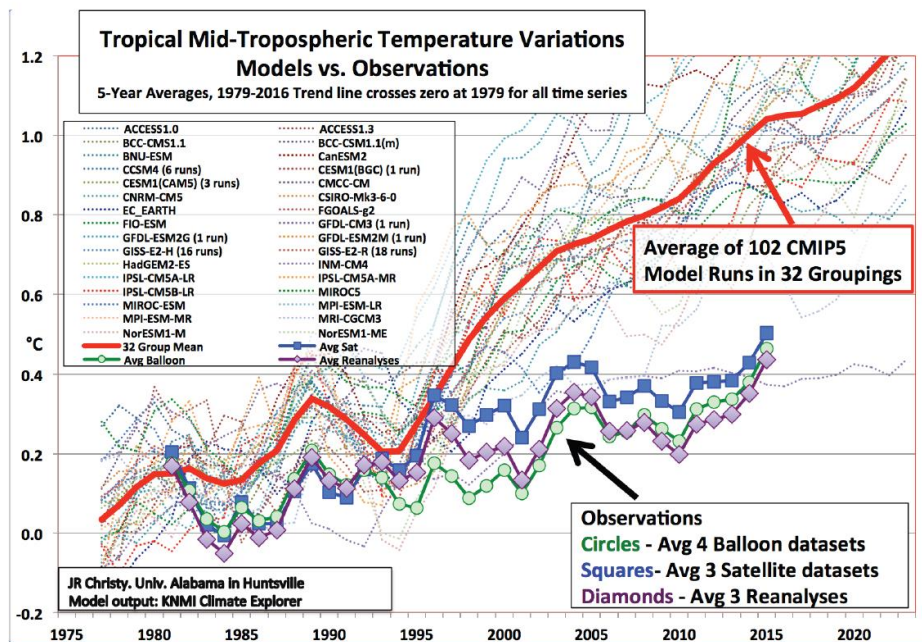
Figure 17
Scatterplot, Electricity Cost vs. Installed Renewable Capacity



Electricity costs as a function of per capita installed renewable capacity. Wind and solar only, excludes hydropower. Per-capita installed renewable capacity by itself explains 84% of the variation in electricity costs across countries. Source: Willis Eschenbach, "[Obama May Finally Succeed!](#)" *Watts Up With That* (blog), August 3, 2015.

As Orr and Palmer note, the climate models EPA used to support the Endangerment Finding predicted Earth would experience two to three times more warming than actually occurred since global measurements became available in the late-1970s (see Figure 18).^{114,115} The Technical Support Document is therefore based on invalidated models. This alone is a legally and scientifically sound basis for at least reopening, if not rescinding, the Endangerment Finding.

Figure 18
IPCC Climate Models Consistently Overstate Warming



Climate models have consistently overestimated the amount of future global warming and are not a reliable basis for public policy. *Source:* John Christy, [Testimony before the U.S. House Committee on Science, Space & Technology](#), March 29, 2017, p. 5.

Evidence collected since the Technical Support Document was written further undermines EPA’s scientific claims. For example, a 2017 study by an international group of scientists, published in *Nature Geoscience*, validated skepticism about IPCC’s work.¹¹⁶ The researchers concluded the climate models used to estimate future temperatures were predicting too much warming—in fact, a full 1 degree F of excess warming by 2017, between what the models predicted and what was actually observed. And this discrepancy is growing every year.

¹¹⁴ Pat Michaels and Chip Knappenberger, “[Climate Models Versus Climate Reality](#),” *Climate Etc.* (blog), December 17, 2015.

¹¹⁵ Sam Kazman and Hans Bader, “[Petition of the Competitive Enterprise Institute and the Science and Environmental Policy Project for Rulemaking on the Subject of Greenhouse Gases and Their Impact on Public Health and Welfare, in Connection with EPA’s 2009 Endangerment Finding, 74 FR 66,496 \(Dec. 15, 2009\)](#)” Competitive Enterprise Institute, February 23, 2017.

¹¹⁶ Richard J. Millar, *et al.*, “[Emission Budgets and Pathways Consistent with Limiting Warming to 1.5°C](#),” *Nature Geoscience* 10 (October 2017); see also Chris Mooney, “[New Climate Change Study Could Buy the Earth Some Time – If They’re Right](#),” *The Washington Post*, September 18, 2017.

The IPCC climate models projected carbon dioxide emissions generated by human activities would need to be capped at 200 billion to 400 billion tons if the predicted “global temperature” increase were to be kept at or below 1.5 degrees C by the year 2100.¹¹⁷ This “allowable” amount of emissions became known as the “carbon budget.” At current rates of emissions, approximately 41 billion tons per year, the “carbon budget” would have been reached within five to 10 years.

However, the *Nature Geoscience* study concluded CO₂ emissions could reach 700 billion tons and warming would remain within 1.5 degrees C by 2100. The researchers gave this prediction a 66 percent chance of being accurate. This would mean carbon dioxide could be emitted for approximately 20 years at present-day emission rates and still meet the goal of limiting “global temperatures” to a rise of 1.5 degrees C by 2100 (assuming CO₂ drives warming).¹¹⁸

The *Nature Geoscience* study has its shortcomings. Like EPA, it too relies on invalidated climate models, and it incorrectly attributes to human-produced greenhouse gases all of the warming that has taken place since the early nineteenth century, 0.9 to 1 degrees C. In fact, approximately 0.4 degrees of that warming occurred before 1945, when humans started to release carbon dioxide into the atmosphere in appreciable quantities. Even with these shortcomings, the study illustrates the significant uncertainty surrounding climate science and the weak case for basing public policy on the IPCC’s ten-year-old models.¹¹⁹

D. The Greening of Planet Earth: Increased atmospheric concentrations of CO₂ promote plant growth, fostering the process of photosynthesis. Far from being a pollutant, CO₂ is essential to the survival of all life on the planet.

All across the planet, the historical increase in the atmosphere’s CO₂ concentration has stimulated vegetative and agricultural productivity. This observed stimulation, or greening of the Earth, has occurred in spite of many real and imagined assaults on Earth’s vegetation, including fires, disease, pest outbreaks, deforestation, and climate change.

Results obtained under 3,586 separate sets of experimental conditions conducted on 549 plant species reveal nearly all plants experience increases in dry weight or biomass in response to atmospheric CO₂ enrichment. Additional results obtained under 2,094 separate experimental conditions conducted on 472 plant species reveal nearly all plants experience increases in their rates of photosynthesis in response to atmospheric CO₂ enrichment.¹²⁰ These observations have been found not only in experiments, but in the observed environment of forest, grassland, and cropland as well.

¹¹⁷ Joeri Rogelj, *et al.*, “[Energy System Transformations For Limiting End-of-Century Warming to Below 1.5 Degrees C](#),” *Nature Climate Change*, May 21, 2015.

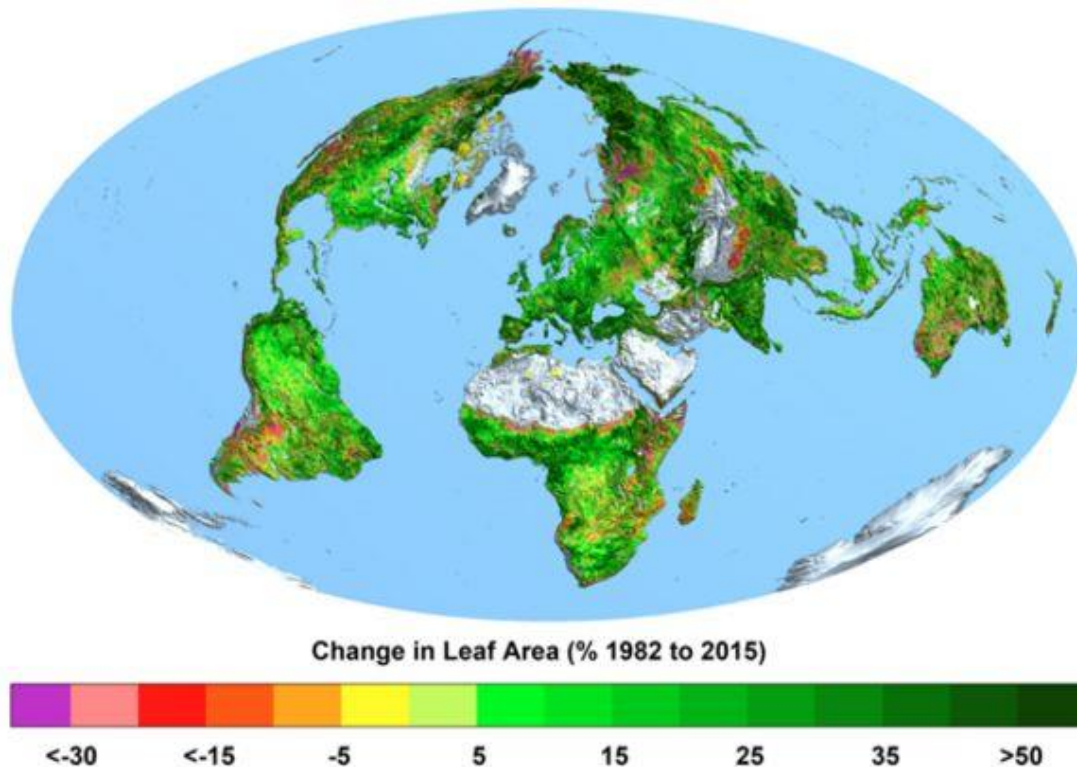
¹¹⁸ Chris Mooney, “[New Climate Change Study Could Buy the Earth Some Time – If They’re Right](#),” *The Washington Post*, September 18, 2017.

¹¹⁹ Patrick Michaels, “[Changes in the Climate Policy Winds](#),” Cato Institute, September 20, 2017.

¹²⁰ Craig D. Idso, *et al.*, “[Summary for Policymakers, Climate Change Reconsidered II, Biological Impacts](#),” Nongovernmental International Panel on Climate Change, 2014.

According to a 2016 article in the scientific journal *Nature Climate Change*, written by an international team of 32 authors from 24 institutions in eight countries, the ongoing rise in the global atmospheric concentration of CO₂ is causing a great greening of the Earth (See Figure 19).¹²¹

Figure 19
The Greening of the Earth



Significant greening has occurred on 25 to 50 percent of the Earth's vegetated land. In contrast, just 4 percent of vegetated land has suffered from plant loss. Seventy percent of this greening was due to increasing concentrations of carbon dioxide in the atmosphere. Graphic from Roger Harrabin, "[Rise in CO₂ has 'Greened Planet Earth.'](#)" BBC News, April 25, 2016.

The *Nature Climate Change* study used satellite data from NASA's Moderate Resolution Imaging Spectrometer and the National Oceanic and Atmospheric Administration's Advanced Very High Resolution Radiometer instruments to help determine the leaf area index, or amount of leaf cover, over the planet's vegetated regions. The greening represents an increase in leaves on plants and trees equivalent in area to two times the continental United States.¹²²

¹²¹ Zaichun Zhu, *et al.*, "[Greening of the Earth and its Drivers.](#)" *Nature Climate Change*, April 25, 2016.

¹²² Roger Harrabin, "[Rise in CO₂ has 'Greened Planet Earth.'](#)" BBC News, April 25, 2016.

CO₂ fertilization explains 70 percent of the greening effect, said co-author Ranga Myneni, a professor in the Department of Earth and Environment at Boston University. “The second most important driver is nitrogen, at 9 percent. So we see what an outsized role CO₂ plays in this process.”¹²³ Increased CO₂ also helps plants retain moisture and increases their ability to survive and thrive in under drought-like conditions.

Atmospheric CO₂ enrichment (henceforth referred to as “rising CO₂”) enhances plant growth, development, and ultimate yield (in the case of agricultural crops) by increasing the concentrations of plant hormones that stimulate cell division, cell elongation, and protein synthesis.¹²⁴ This means that, far from endangering human health and welfare under Clean Air Act section 202(a), more atmospheric CO₂ actually improves human health and welfare.

What could be more ironic than increased atmospheric concentrations of CO₂ causing an actual greening of the planet—not a global environmental catastrophe? This is further confirmation that CO₂ is not a pollutant and presents no threat of catastrophic results from global warming. Rather, it means increased CO₂ has been environmentally beneficial, and the so-called “social cost” of carbon is actually less than zero, amounting to a net benefit, even increasing GDP through increased agricultural production.

E. Even the official “global temperature” record, which has been adjusted to promote global warming hysteria, has not followed the pattern of increased atmospheric concentrations of CO₂, but rather has followed the pattern of natural causes, primarily solar activity and ocean cycles.

Even the official surface temperature record—with which global warming alarmists have tampered in recent decades to show a warming pattern—does not align with increased carbon dioxide emissions over the twentieth century. Instead, temperatures have followed long-established patterns of natural cycles.

The increase in “global temperatures” since the late nineteenth century reflects nothing more than the end of the Little Ice Age, a 500-year period from about 1350 AD to about 1850 AD that saw “global temperatures” consistently 2 to 3 degrees F cooler than the previous Medieval Warm Period average. The “global temperature” trends since then have followed not CO₂ emission trends, but rather the ocean temperature cycles of the Pacific Decadal Oscillation (PDO) and Atlantic Multidecadal Oscillation (AMO). Every 20 to 30 years, the much colder water near the bottom of the oceans cycles up to the top, where it has a slight cooling effect on the atmosphere until the Sun warms that water. That warmed water then contributes to slightly warmer temperatures, until the next churning cycle.¹²⁵

¹²³ *Id.*

¹²⁴ Craig D. Idso, *et al.*, “[Summary for Policymakers, Climate Change Reconsidered II, Biological Impacts.](#)” Nongovernmental International Panel on Climate Change, 2014.

¹²⁵ Craig D. Idso, *et al.*, [Climate Change Reconsidered II, Biological Impacts](#), Nongovernmental International Panel on Climate Change (NIPCC) (Arlington Heights, Ill: The Heartland Institute, 2014); Craig D. Idso, *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, Ill: The Heartland Institute, 2016).

Those ocean temperature cycles, and the continued recovery from the Little Ice Age, help explain why “global temperatures” rose from 1915 until 1945, when CO₂ emissions were much lower than they have been in recent years. The change to a cold ocean temperature cycle, primarily the PDO, is the main reason temperatures fell from 1945 until the late 1970s, despite the rising CO₂ emissions during that time from the postwar industrialization spreading across the globe.¹²⁶ EPA steadfastly ignored these cycles and related evidence.

The 20- to 30-year ocean temperature cycles turned back to warm from the late 1970s until the late 1990s, and “global temperatures” rose during this period. But that warming ended twenty years ago. “Global temperatures” have stopped increasing since then and may have actually dropped, even though global CO₂ emissions have soared.¹²⁷ As *The Economist* magazine reported in March 2013, “Over the past 15 years air temperatures at the Earth’s surface have been stable while greenhouse-gas emissions have continued to soar. The world added roughly 100 billion tonnes of carbon to the atmosphere between 2000 and 2010. That is about a quarter of all the CO₂ emitted by humanity since 1750.”¹²⁸ Yet, there has been no warming during that 10-year time frame. That is because the carbon dioxide greenhouse effect is weak and marginal compared to natural causes of “global temperature” changes.

These developments further invalidate IPCC’s global climate models, which never projected the recent stabilization of temperatures. Without manipulation, these models cannot even recreate the past, up and down, temperature trends of the twentieth century, let alone the more extended Little Ice Age, and the Medieval Warm Period before that, another reason the models cannot be trusted.

F. “Global temperature” projections of unverified “climate models,” which involve hypothetical forecasts of, *not evidence of*, global warming, have increasingly diverged from the most reliable temperature records computed from the data collected by U.S. satellites. In fact, satellite data indicate global warming stopped 20 years ago, further falsifying the models.

The supposedly scientific foundation for potentially catastrophic, anthropogenic, global warming, or climate change, is based on the temperature projections of dozens of global climate models voluntarily developed and contributed to the IPCC by various scientists across the globe. These climate models are not solid science. They are merely speculative scenarios about climate, none of which has been validated by the historical temperature record. The scientific method involves testing a falsifiable hypothesis with experiments and evidence. Climate model projections do not involve any such falsifiable hypothesis, so they are not an exercise of the scientific method.

Even the modelers themselves recognize and admit their models are not designed to produce *predictions* of future temperatures, but just “what if” *projections* of the results of unproven

¹²⁶ *Id.*

¹²⁷ *Id.*

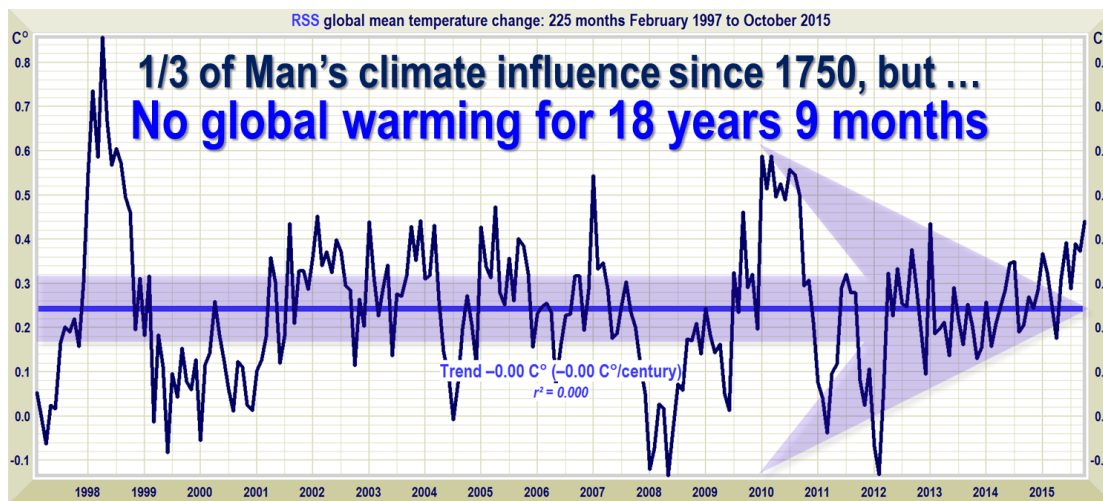
¹²⁸ “[A sensitive matter](#),” *The Economist*, March 30, 2013.

assumptions, to provide some indications, not scientific proof, of future scenarios that could occur if the assumptions turn out to be correct. *Climate Change Reconsidered* states, “The science literature is replete with admissions by leading climate modelers that forcings and feedback are not sufficiently well understood, that data are insufficient or too unreliable, and that computer power is insufficient to resolve important climate processes.”¹²⁹

Moreover, none of the models adequately accounts for the Pacific and Atlantic Ocean temperature cycles. None takes into account solar activity cycles indicated by variations in the number and size of sunspots, variations in solar magnetic fields, or cosmic rays flux, all of which are known to significantly affect climate. These cycles have produced major climate changes in the past, such as the Little Ice Age (AD 1350 to about 1850), Medieval Warm Period (about AD 950 to 1250)—during which ‘global temperatures’ were higher than today—and the early twentieth century warm period from 1915 to 1945.

These design flaws explain why the projections of *all* climate models have now diverged so far from the actual temperatures experienced over the past two decades, as indicated in Figure 20 below. That graph shows no global warming for nearly 20 years, *which none of the models projected*.

Figure 20
RSS Global Mean Temperature Change
225 Months, February 1997 to October 2015



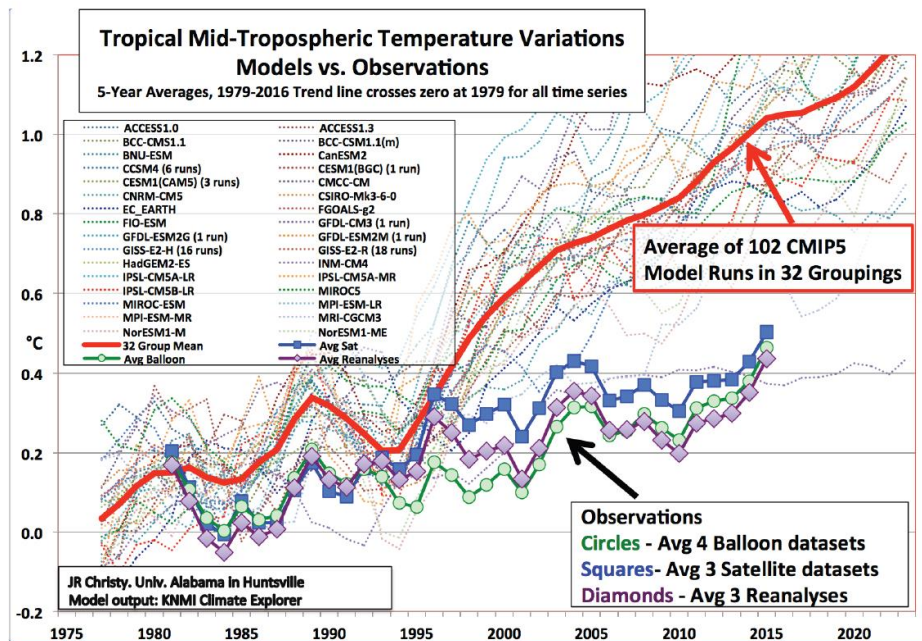
The least-squares trend on the RSS satellite dataset shows no global warming for 18 years 9 months, February 1997 to October 2015, the longest period of the global warming pause—even though one-third of all anthropogenic forcings occurred during that period. *Source:* Christopher Monckton, “[Tamper, Tamper! How They Failed to Hide the Gulf Between Predicted and Observed Warming](#),” *Watts Up With That* (website), January 3, 2018.

¹²⁹ Craig D. Idso, Robert F. Carter, S. Fred Singer, *Climate Change Reconsidered II: Physical Science, Summary for Policymakers* (Chicago, IL: The Heartland Institute for the Nongovernmental International Panel on Climate Change, 2013), p 6.

The projections of the models, and their increasing divergence from observations, are shown in Figure 21 below. The graph was created by NASA scientist Dr. John Christy who, with his colleagues at the University of Alabama in Huntsville, monitors atmospheric temperatures as computed from the data collected by U.S. satellites.

The atmospheric temperatures recorded by U.S. weather satellites and weather balloons are shown by lines at the bottom of the graph, connecting the squares or the circles. The average of the temperature models is the solid red line going through the spaghetti of lines representing the projections of each model. The average projection is well above the observed real-world temperatures, with the divergence growing with time.

Figure 21
IPCC Climate Models Consistently Overstate Warming



Climate models have consistently overestimated the amount of future global warming and are not a reliable basis for public policy. Source: John Christy, [Testimony before the U.S. House Committee on Science, Space & Technology](#), March 29, 2017, p. 5.

This sharp and growing difference between the projections of the IPCC models and real-world temperatures has been a devastating development for the theory of catastrophic, anthropogenic, global warming.

G. Because of higher humidity in the tropics, EPA’s own climate models show an accumulating “hot spot” in the atmosphere over the tropics, considered “the fingerprint” of human-caused global warming. But such a tropical “hot spot” does not appear in any observed temperature record, contradicting the theory of human-caused global warming.

The theory underlying the climate models cited by U.N.’s IPCC specifies that a “fingerprint” of anthropogenic global warming should appear in the form of a “hot spot” in the upper troposphere (the lowest layer in the atmosphere) over the tropical latitudes of Earth. Hypothetically, the increased moisture and higher humidity of the tropics amplifies the warming effect of greenhouse gases in the tropics; that amplification supposedly causes enhanced greenhouse gas warming in the tropical troposphere, with temperatures increasing at higher altitudes, labeled the “tropical hot spot.” This tropical hot spot is so fundamental to the theory of anthropogenic global warming that it has been labelled the “human fingerprint” identifying anthropogenic global warming.

But this so-called human fingerprint of global warming does not appear in the temperature records of any of the 13 most important sources of temperature data at altitude, from satellites orbiting the globe and collecting data 24/7, to thermometers raised aloft by weather balloons.¹³⁰ Research documenting the missing fingerprint was updated in April 2017 by Drs. James P. Wallace III, John R. Christy, and Joseph S. D’Aleo.¹³¹ The statement accompanying the release of the updated report notes,

A just released peer reviewed climate science Research Report has proven that it is all but certain that EPA’s basic claim that CO₂ is a pollutant is totally false. All research was done pro bono.

This research failed to find that the steadily rising atmospheric CO₂ concentrations have had a statistically significant impact on any of the 14 temperature data sets that were analyzed. The tropospheric and surface temperature data measurements that were analyzed were taken by many different entities using balloons, satellites, buoys and various land based techniques. Needless to say, if regardless of data source, the analysis results are the same, the analysis findings should be considered highly credible.

The analysis results invalidate EPA’s CO₂ Endangerment Finding, including the climate models that EPA has claimed can be relied upon for policy analysis purposes. Moreover, these research results clearly demonstrate that once the solar, volcanic and oceanic activity, that is, natural factor, impacts on temperature data are accounted for, there is no “record setting” warming to be concerned about. In fact, there is no Natural Factor

¹³⁰ See, e.g., Craig D. Idso, *et al.*, *Climate Change Reconsidered II, Biological Impacts*, Nongovernmental International Panel on Climate Change (NIPCC) (Arlington Heights, IL: The Heartland Institute, 2014); Craig D. Idso, *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, IL: The Heartland Institute, 2016); James P. Wallace III, John R. Christy, and Joseph S. D’Aleo, [*On the Existence of a “Tropical Hot Spot” & The Validity of EPA’s CO₂ Endangerment Finding. Abridged Research Report, Second Edition*](#), April 2017.

¹³¹ James P. Wallace III, John R. Christy, and Joseph S. D’Aleo, [*On the Existence of a “Tropical Hot Spot” & The Validity of EPA’s CO₂ Endangerment Finding. Abridged Research Report, Second Edition*](#), April 2017.

Adjusted Warming at all. The authors of this report claim that there is no published, peer reviewed, statistically valid proof that past increases in atmospheric CO₂ concentrations have caused the officially reported rising, even claimed record setting temperatures. And, EPA's climate models fail to meet this test.¹³²

The significance of the missing fingerprint was explained by Alan Carlin in April 2017 at his blog, *Carlin Economics and Science*:

Previously climate skeptics have raised [myriad reasons why reducing human emissions would have little effect on global temperatures](#) despite alarmist arguments based on elaborate computer models that are inherently incapable of accurately representing the climate and have never been validated. These climate models invariably predict that higher CO₂ levels will lead to higher temperatures. The Research Report invalidates this conclusion 14 separate times using different databases. It robustly invalidates the argument that reductions in CO₂ emissions as advocated by the UN and the Obama Administration will have a significant effect on global temperatures. So government-decreed reductions are a total waste of taxpayer and ratepayer dollars and very harmful to job creation, economic growth, and the poor.¹³³

The Technical Support Document for the Endangerment Finding referenced and relied on the tropical hotspot for its theory of endangerment, and said if that hotspot were missing, it would be “an important inconsistency.”¹³⁴

The U.S. Climate Change Science Program also referenced and relied upon the tropical hot spot, saying if it were missing it would be “a potentially serious inconsistency.”¹³⁵

IPCC's Fourth Assessment Report (AR4) also states the tropical hot spot is “an integral feature of the physical understanding of the climate's greenhouse warming mechanism.”¹³⁶ EPA's Endangerment Finding explicitly and repeatedly relied upon the U.S. CCSP reports and AR4. The lack of the forecast hot spot is intellectually disabling for the theory of anthropogenic global warming/climate change.

¹³² Reprinted at Alan Carlin, “[Second Edition of Pathbreaking Research Report Shows the Orwellian Nature of the ‘March for Science’](#),” *Carlin Economics and Science* (blog), April 23, 2017.

¹³³ *Id.*

¹³⁴ [Technical Support Document](#), Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act (74 FR 66496, Dec. 15, 2009) (original EPA Docket No. EPA-HQ-OAR-2009-171), p. 50.

¹³⁵ U.S. Climate Change Science Program, Synthesis and Assessment Product 1.1, [Temperature Trends in the Lower Atmosphere – Understanding and Reconciling Differences](#), Chapter 1, Section 1.1, The Thermal Structure of the Atmosphere, pp. 17–19.

¹³⁶ IPCC AR4 WG1, Section 9.2.2, [The Physical Science Basis](#), Chapter 9, Figure 9.1 “Greenhouse gas forcing is expected to produce warming in the troposphere ...”).

H. There is a natural limit to any CO₂-induced global warming, as the effect of increasing CO₂ in causing warming declines logarithmically to zero as CO₂ concentration increases.

Climate models consistently fail to accurately predict global temperature because they assume carbon dioxide will have a larger warming effect on the planet than has been observed. This so-called “climate sensitivity” reflects how much the planet will warm in response to increasing concentrations of atmospheric CO₂ concentrations.¹³⁷

The relationship between CO₂ levels and temperature is not one-to-one: If CO₂ levels double, this does not mean temperatures will double. But how much *will* the temperature increase? That is a key question in the ongoing scientific debate over anthropogenic climate change.

As explained by Orr and Palmer:¹³⁸

The temperature change associated with a doubling of atmospheric carbon dioxide concentrations is referred to as Equilibrium Climate Sensitivity (ECS).¹³⁹ The logarithmic nature of ECS means each additional molecule of carbon dioxide released into the atmosphere traps heat less effectively than the previous molecule. In other words, as more carbon dioxide is emitted into the atmosphere, the rate at which the temperature rises will slow ...

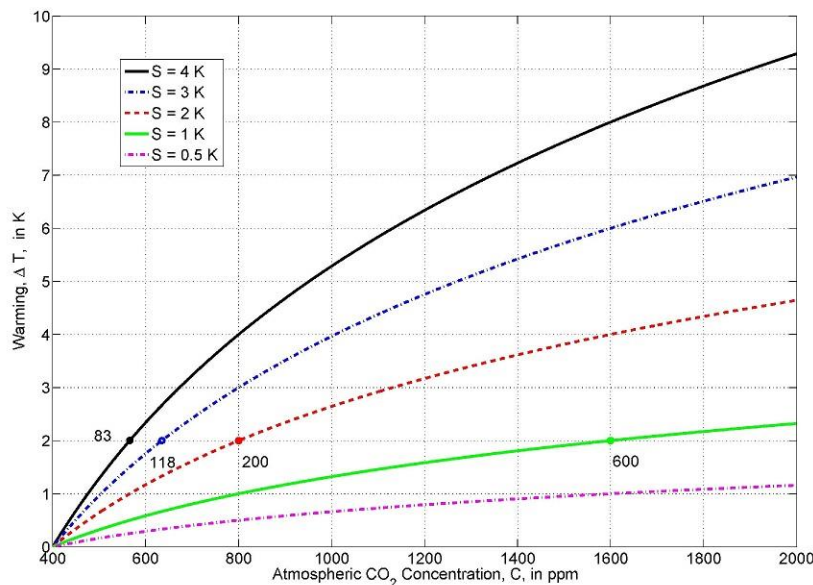
Figure 22 below, from physicist William Happer, projects how long it would take to get 2 degrees C of warming for various doubling sensitivities and a logarithmic response. In private correspondence with the authors, Happer writes, “Bottom line: We have anywhere from about a century to millennia to really understand the response of the climate to more CO₂.”

¹³⁷ Tim Wogan, [“Earth’s Climate May Not Warm as Quickly as Expected, Suggest New Cloud Studies,”](#) *Science*, May 25, 2016.

¹³⁸ Isaac Orr and Fred Palmer, “How Obama-Era Regulations Are Shutting Down Perfectly Good Power Plants,” *Policy Study* No. 146, The Heartland Institute, February 2018, p. 17.

¹³⁹ Intergovernmental Panel on Climate Change, [“Climate Sensitivity and Feedbacks,”](#) Fourth Assessment Report, 2007.

Figure 22
Projections, Logarithmic Warming
In Response to Atmospheric Carbon Dioxide



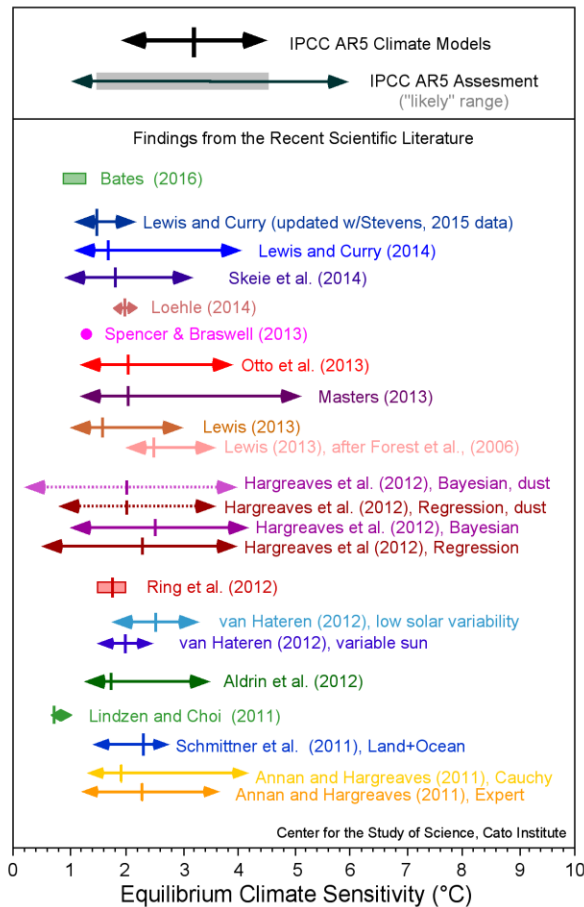
The impact of carbon dioxide on temperatures is logarithmic; meaning, as more carbon dioxide is emitted into the atmosphere (x-axis), it has less impact on temperatures (y-axis). This graph projects how many years it would take to get 2 degrees C of warming for various doubling sensitivities and a logarithmic response. *Source:* William Happer, Princeton University, private correspondence to the authors. Happer writes: “Bottom line: We have anywhere from about a century to millennia to really understand the response of the climate to more CO₂.”

IPCC’s 2007 AR-4 report assumes that for every doubling of atmospheric CO₂, the world will experience a temperature increase between 2 and 4.5 degrees C, with their “best estimate” to be 3 degrees C. It is now widely agreed that this estimate is too high. A 2013 paper by Alexander Otto and colleagues—a group that previously led climate modeling for IPCC—concluded the likely range of temperature increase from a doubling of carbon dioxide would be between 1.2 and 3.9 degrees C, with their “best estimate” being 2 degrees C, a reduction of 33 percent compared to the values provided in AR-4 (see Figure [23]).¹⁴⁰

The Otto team’s finding was published in IPCC’s Fifth Assessment Report (AR-5) in 2013. The Endangerment Finding, which was based on AR-4, was not amended to reflect the most up-to date science. This is a second legally and scientifically sound basis for reopening, if not rescinding, the Endangerment Finding.

¹⁴⁰ Alexander Otto, *et al.*, “[Energy Budget Constraints on Climate Response](#),” *Nature Geoscience*, May 19, 2013.

Figure 23
Model Ranges of Equilibrium Climate Sensitivity Estimates



Equilibrium climate sensitivity estimates of several studies show the values used by IPCC in its AR-4 and AR-5 assessments are likely too high, causing the models to run hot. Two notable distributions are the Otto *et al.* study (red), which puts the “best guess” at 2 degrees C, and the Lewis and Curry (updated w/Stevens 2015 data) study (dark blue), which shows a very small range of possible outcomes for a doubling of carbon dioxide with a likely mean climate sensitivity of 1.4 degrees C. *Source:* Pat Michaels and Paul Knappenberger, “[You Ought to Have a Look: Ontario’s Energy Plan, Evidence-Based Policy and a New Climate Sensitivity Estimate](#),” *Cato at Liberty* (blog), Cato Institute, May 25, 2016.

Even the lower values for ECS presented by Otto *et al.* are subject to uncertainty and could be revised down further. For example, the estimates might reflect unrealistically high estimates of the cooling effects from sulfate aerosols.¹⁴¹ Although sulfate aerosols come from natural sources

¹⁴¹ Nathanael Massey, “[IPCC Revises Climate Sensitivity](#),” *Scientific American*, September 27, 2013.

such as phytoplankton and volcanoes, according to the IPCC AR4,¹⁴² they are largely the result of the combustion of fossil fuels. Regardless of their source, these particles are thought to cool the Earth. According to NASA:¹⁴³

The sulfate aerosols absorb no sunlight but they reflect it, thereby reducing the amount of sunlight reaching the Earth's surface.

The sulfate aerosols also enter clouds where they cause the number of cloud droplets to increase but make the droplet sizes smaller. The net effect is to make the clouds reflect more sunlight than they would without the presence of the sulfate aerosols.

Recent studies of the impact of sulfate-aerosol cooling on “global temperatures” have found these particles have less cooling impact than estimated by IPCC. IPCC models had estimated sulfate aerosols will reduce temperatures between 0.1 and 1.4 degrees C.¹⁴⁴ The new studies find the likely cooling effect of sulfate aerosols to be between 0.2 and 0.8 degrees C, with additional studies suggesting the most likely cooling value to be about 0.4 degrees C. This means the amount of cooling that is likely occurring from sulfate aerosols is approximately 3.5 times less than the highest amount expected by IPCC.

This is an important finding because “global temperatures” have been essentially level since 1998, even though approximately one-third of all human carbon dioxide emissions have occurred since that year. The lower cooling effects of sulfate aerosols plus more carbon dioxide in the atmosphere should have led to a large increase in “global temperatures.” That didn't happen. With the exception of 2015–2016, during which the planet experienced the warming of a record El Niño, “global temperatures” have been stable. This strongly suggests IPCC is still overestimating the warming impact of carbon dioxide in the atmosphere.

If sulfate aerosols are not cooling the planet to “hide” carbon dioxide-induced global warming, and “global temperatures” have not been rising for nearly two decades despite large amounts of carbon dioxide being released into the atmosphere, then clearly carbon dioxide emissions result in less warming than predicted by IPCC computer models. Those models have predicted the planet would experience two or three times more global warming than has actually been observed by satellites and weather balloons.

The importance of accurately determining how much global warming will occur from doubling carbon dioxide concentrations in the atmosphere cannot be overstated. If Earth's climate is less sensitive to increasing concentrations of carbon dioxide than IPCC says it is, efforts to prevent future global warming by radically reducing carbon dioxide will be both ineffective and expensive. Reducing the “best estimate” for ECS from IPCC's 2007 finding of 3 degrees C to the

¹⁴² Intergovernmental Panel on Climate Change, *Climate Change 2007: Working Group I: The Physical Science Basis*, [2.4.4.1 Sulphate Aerosol](#).

¹⁴³ National Aeronautics and Space Administration, [“Atmospheric Aerosols: What Are They, and Why Are They So Important?”](#)

¹⁴⁴ Bjorn Stevens, [“Rethinking the Lower Bound on Aerosol Radiative Forcing,”](#) *Journal of Climate*, June 2015.

1.4 degrees C found in more recent studies would effectively reduce the impact of reducing carbon dioxide emissions by one-half.¹⁴⁵

Because these models, the basis of the Endangerment Finding, have been unable to accurately predict future temperatures, the Competitive Enterprise Institute (CEI) has put forward a Petition for Reconsideration of the Endangerment Finding, noting:

A rulemaking proceeding is appropriate when new developments demonstrate that an existing rule or finding rests on erroneous factual premises, and a rulemaking petition is a proper vehicle for asking an agency “to reexamine” the “continuing vitality” of a rule.¹⁴⁶

Especially because there has been so much new science since the Endangerment Finding, particularly which directly contradicts the Finding, this Petition should be seriously considered, and the Endangerment Finding reopened for reconsideration, as the Petition requests.

I. Based on the record of CO₂ proxies, Earth’s concentration of CO₂ has been several times higher in geological history, with no record of any catastrophic results.

Carbon dioxide proxies include deep ice core samples from glaciers and polar ice caps, and stalactites and stalagmites accumulating deep in caves. According to data derived from those proxies, “At the current level of 400 parts per million, we still live in a CO₂-starved world. Atmospheric levels 15 times greater existed during the Cambrian Period (about 550 million years ago) without known adverse effects.”¹⁴⁷

CO₂ starvation refers to the role of atmospheric carbon dioxide in the survival of plants. Atmospheric CO₂ concentrations had dipped below 300 parts per million before the Industrial Revolution. The minimum for plant survival is believed to be approximately 250 parts per million. The Industrial Revolution and fossil fuels may have saved mankind in more ways than the most obvious.

J. The surrogate record also shows the historical pattern is for temperatures to rise first, and CO₂ to rise centuries later, reversing the notion that increased CO₂ causes increased warming.

The historical record shows temperatures do not rise in response to rising carbon dioxide concentrations in the atmosphere. Instead, the record shows temperature rises first, and then

¹⁴⁵ Nic Lewis, “[Updated Climate Sensitivity Estimates](#),” *Climate Etc.* (blog), April 25, 2016.

¹⁴⁶ Sam Kazman and Hans Bader, “[Petition of the Competitive Enterprise Institute and the Science and Environmental Policy Project for Rulemaking on the Subject of Greenhouse Gases and Their Impact on Public Health and Welfare, in Connection with EPA’s 2009 Endangerment Finding, 74 FR 66,496 \(Dec. 15, 2009\)](#)” Competitive Enterprise Institute, February 23, 2017.

¹⁴⁷ Craig D. Idso, *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, Ill: The Heartland Institute, 2016), p. 3.

hundreds of years later, atmospheric carbon dioxide concentrations have increased, which reverses the supposed cause and effect of hypothetical anthropogenic global warming. As Craig Idso and colleagues note in *Climate Change Reconsidered II: Physical Science*:

Establishing the historic phase relationship between atmospheric carbon dioxide and temperature is a necessary step toward understanding the physical relationship between CO₂ forcing and climate change. When such analyses are conducted, changes in CO₂ are frequently seen to *lag* changes in temperature by several hundred years.¹⁴⁸

K. The oceans are not rising any faster than they have since the end of the last ice age, polar ice caps and glaciers are not uniformly melting, and weather is not getting more extreme.

In an October 2017 critique of the sea level rise discussion in the U.S. government's draft Climate Science Special Report,¹⁴⁹ Steven E. Koonin (who served as Energy Department Undersecretary President Barack Obama) writes:

In discussing global sea level rise since 1990, the draft of the Climate Science Special Report (CSSR) notes that the rate of rise since 1993 is significantly greater than the average rate of rise from 1900-1990, but fails to mention the substantial and well-established decadal fluctuations during the 20th century. In fact, the rates since 1993 are statistically indistinguishable from the rates in the first half of the 20th century.

The Executive Summary of the CSSR draft (Page 26, line 8) reads:

Global mean sea level (GMSL) has risen by about 7-8 inches (about 16-21 cm) since 1900, with about 3 of those inches (about 7 cm) occurring since 1993 (*very high confidence*).

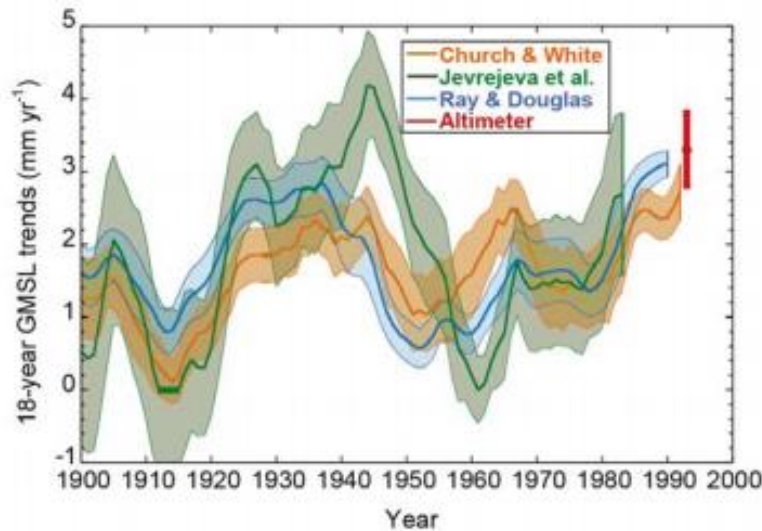
Considerable fluctuations in sea level rise during the twentieth century are “well established and discussed extensively in the literature,” Koonin notes. IPCC's Fifth Assessment Report (AR5) included Figure 24 below and said rates of global average sea level rise between 1920 and 1950 were likely as high as they were between 1993 and 2010.¹⁵⁰

¹⁴⁸ Craig D. Idso, *et al.*, [Climate Change Reconsidered II, Physical Science](#), Nongovernmental International Panel on Climate Change (NIPCC) (Arlington Heights, Ill: The Heartland Institute, 2014), p. 149.

¹⁴⁹ Steven Koonin, [“Critique of the Draft CSSR discussion of post-1900 Sea Level Rise.”](#) October 10, 2017.

¹⁵⁰ Intergovernmental Panel on Climate Change, [Climate Change 2013: The Physical Science Basis](#), p. 289.

Figure 24
Eighteen-Year Trends of Global Mean Sea Level Rise



18-year trends of GMSL rise estimated at 1-year intervals. The time is the start date of the 18-year period, and the shading represents the 90% confidence. The estimate from satellite altimetry is also given, with the 90% confidence given as an error bar. Uncertainty is estimated by the variance of the residuals about the fit, and accounts for serial correlation in the residuals as quantified by the lag-1 autocorrelation. Data source: IPCC's Fifth Annual Report (2013), Working Group I, Figure 3.14

Figure 24 shows recent sea-level trends are not significantly different from what they were seven to nine decades ago, when atmospheric carbon dioxide levels were 310 parts per million (ppm) or less, compared to current carbon dioxide concentrations around 410 ppm. As Ben Zycher of the American Enterprise Institute explains, “the sea level has been oscillating about the same almost perfectly linear trend line all over the 20th century and the first 17 years of this century.”¹⁵¹ Or in plainer terms, “Increases in sea levels have not accelerated over the last 117 years despite increases in [greenhouse gas] concentrations.”¹⁵²

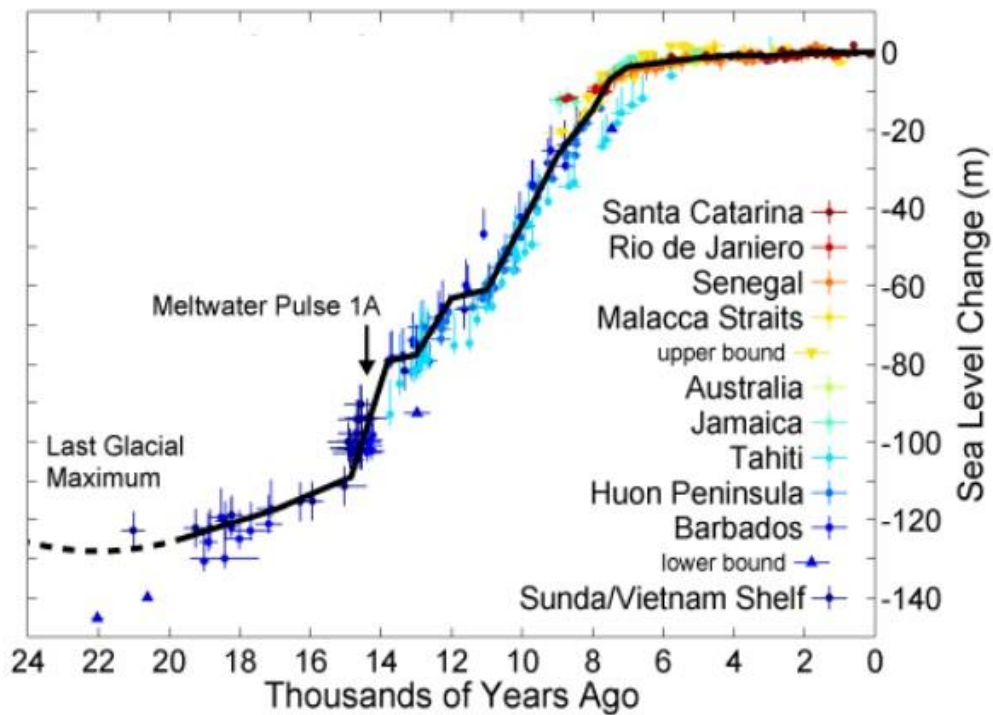
Oceans are not rising any faster than they have since the end of the last ice age approximately 20,000 years ago, when sea level was approximately 130 meters (425 feet) lower than present levels (see Figure 25).¹⁵³ In fact, as shown in the figure below, sea levels have risen at a pace much slower over the past 7,000 years than at any time over the past 20,000 years.

¹⁵¹ Ben Zycher, “[The Union of Concerned Activists: Let the Lawsuits Begin!](#)” AEI.org, November 2, 2017.

¹⁵² *Id.*

¹⁵³ Rud Istvan, “[Sea Level Rise, Acceleration and the Closure Problem,](#)” *Climate Etc.* (blog), July 20, 2016.

Figure 25
Global Sea Level Rise – Past 24,000 Years

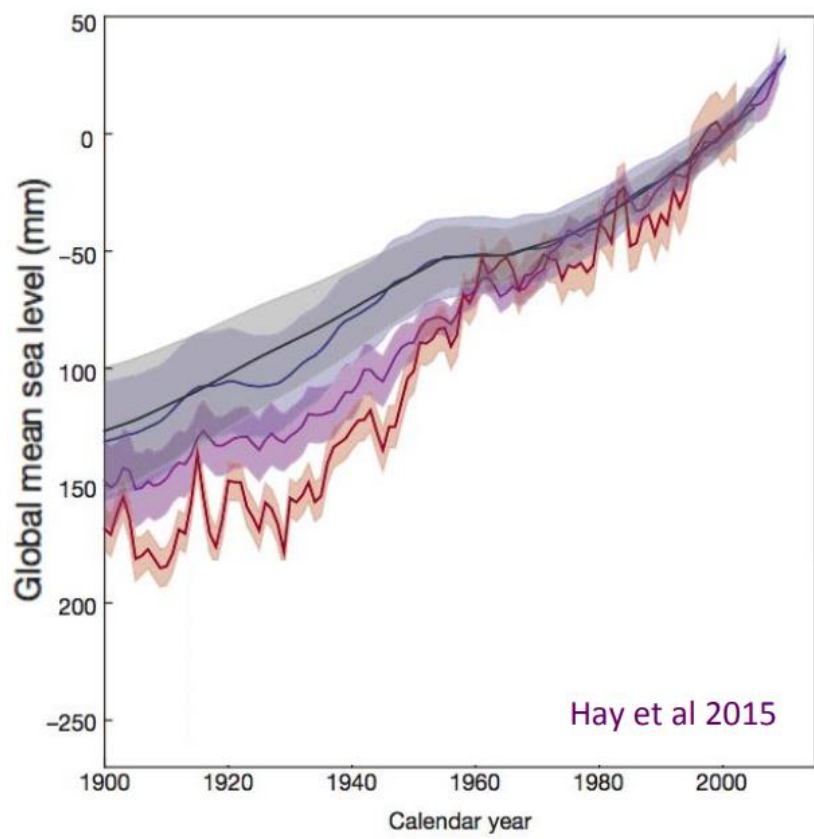


Sea level rise has been consistent on recent geologic timescales. Sea levels rose dramatically after the Laurentide Ice Sheet, a massive sheet of ice that covered much of North America, began to retreat approximately 20,000 years ago. *Source:* David Ullman, [“The Retreat Chronology of the Laurentide Ice Sheet During the Last 10,000 Years and Implications for Deglacial Sea-Level Rise,”](#) University of Wisconsin Madison.

More recently, sea level has risen approximately eight inches since 1900, with a substantial portion of that rise happening between 1900 and 1950, when humans had emitted only one-tenth of the carbon dioxide emitted into the atmosphere since the Industrial Revolution (see Figure 26).¹⁵⁴

¹⁵⁴ Carling Hay, *et al.*, [“Probabilistic Reanalysis of Twentieth Century Sea-Level Rise,”](#) *Nature*, January 14, 2015.

Figure 26
Reanalysis of Twentieth-Century Sea Level Rise



Sea level has risen since 1900, but much that rise came be human-caused carbon dioxide emissions starting rising dramatically after 1950. This suggests natural variation also played a significant role in the sea level rise of the twentieth century. Source: Carling Hay, *et al.*, "[Probabilistic Reanalysis of Twentieth Century Sea-Level Rise.](#)" *Nature*, January 14, 2015.

Concerns about sea level rise are based on the potential for two major ice sheets, the Greenland Ice Sheet and the Antarctic Ice Sheet, to melt, potentially causing dramatic and overwhelming increases in sea level. The Greenland Ice Sheet covers 660,000 square miles, is more than a mile thick, and has a volume of 684,000 cubic miles. If this ice sheet were to melt completely, it would result in a 25-foot rise in sea levels.¹⁵⁵

However, historical evidence suggests fears of a rapid, catastrophic collapse of the Greenland Ice Sheet are unfounded. During the Eemian period, the last interglacial period, sea level was approximately 6.6 meters higher than at present. "Global temperatures" were approximately 2°C higher than they are now, and Arctic summer temperatures were 3° to 5°C higher, with some

¹⁵⁵ Andreas P. Ahlstrøm, *et al.*, "[Abrupt Shift in the Observed Runoff From the Southwestern Greenland Ice Sheet.](#)" *Science Advances*, December 13, 2017.

areas of Greenland experiencing temperatures 8°C higher than at present.¹⁵⁶ These warmer conditions persisted for a 6,000-year period between 122,000 and 128,000 years ago.

Despite the much-warmer Arctic temperatures persisting for 6,000 years, the Greenland ice sheet lost only about 10 percent of its ice during the Eemian, though ice loss could have been as high as 30 percent in lower-elevation areas.¹⁵⁷ Climate models project a future warming of 3°C over northwestern Greenland by around 2100. Based on ice-loss rates observed in the Eemian, it would take 12,000 summers to melt less than 30 percent of the ice mass in Greenland.¹⁵⁸

The Antarctic Ice Sheet (AIS) is split into two distinct ice sheets, the East Antarctic Ice Sheet (EAIS) and the West Antarctic Ice Sheet (WAIS). The EAIS is 10 times larger than the WAIS, and it is estimated sea level would rise nearly 200 feet if the EAIS completely melted.¹⁵⁹

However, recent studies suggest the EAIS would remain stable even if the smaller WAIS were to melt. Studies indicate the WAIS may be more susceptible to melting, because the ice is grounded below sea level and the largest volcanic region on Earth lies under the WAIS.¹⁶⁰

Koonin noted in 2014, “the shrinking extent of Arctic sea ice observed over the past two decades” was more than offset by “the comparable growth of Antarctic sea ice, which is now at an all time high.”¹⁶¹ Craig Idso and colleagues note in *Why Scientists Disagree About Global Warming*, “Melting of Arctic sea ice and polar ice caps is not occurring at ‘unnatural’ rates and does not constitute evidence of a human impact on climate.”¹⁶²

Moreover, weather is not getting more extreme, as has been repeatedly falsely hyped over the past year. Hurricanes, tornadoes, and droughts are following in line with the historical record, and the United States has just ended a record 11-year period with no serious hurricanes making landfall. Global weather patterns show no threat of ultimately catastrophic, anthropogenic, climate change.

¹⁵⁶ Audrey M. Yau, *et al.*, “[Reconstructing the Last Interglacial at Summit, Greenland: Insights from GISP2.](#)” Proceedings of the National Academy of Sciences, December 16, 2015.

¹⁵⁷ Patrick Michaels and Chip Knappenberger, “Lukewarming: The New Climate Science that Changes Everything,” Cato Institute, 2016, p. 204.

¹⁵⁸ *Id.*

¹⁵⁹ Science Daily, “[Study Validates East Antarctic Ice Sheet to Remain Stable Even if Western Ice Sheet Melts.](#)” Science News, August 17, 2017.

¹⁶⁰ Maximillian van Wyk de Vries, *et al.*, “[A new volcanic province: an inventory of subglacial volcanoes in West Antarctica.](#)” Geological Society of London, May 29, 2017.

¹⁶¹ Steven E. Koonin, “[Climate Science Is Not Settled.](#)” *The Wall Street Journal*, Sept. 9, 2014.

¹⁶² Craig D. Idso *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, Ill: The Heartland Institute, 2016), p. xxi.

L. Even IPCC has slashed climate sensitivity assumptions, or the rate at which warming is expected to increase due to rising CO₂ concentrations.¹⁶³

IPCC's 2007 Fourth Assessment Report assumes that for every doubling of atmospheric carbon dioxide concentrations, the world will experience a temperature increase between 2 and 4.5 degrees C, with its "best estimate" at 3 degrees C. It is now widely agreed this estimate is too high.

As described previously, Otto *et al.* (2013) provided their "best estimate" of 2 degrees C for the impact of doubling of atmospheric CO₂ concentrations, a result that was reported in IPCC's Fifth Assessment Report (AR-5) in 2013.

M. Solar sunspot patterns indicate future global cooling, rather than global warming, may be on the way.¹⁶⁴

The current global warming pause is likely due to ocean cycles turning back to cold. But something much more ominous has developed over the past 20 years.

Sunspot activity runs in 11-year short-term cycles, with longer cyclical trends of 90 and 200 years. The number of sunspots declined substantially in recent cycles after levelling over the previous 20 years. In the most recent cycle, sunspot activity collapsed. NASA's *Science News* report for January 8, 2013 stated,

Ongoing Solar Cycle 24 [the current short-term 11-year cycle] is the weakest in more than 50 years. Moreover, there is controversial evidence of a long-term weakening trend in the magnetic field strength of sunspots. Matt Penn and William Livingston of the National Solar Observatory predict that by the time Solar Cycle 25 arrives, magnetic fields on the Sun will be so weak that few if any sunspots will be formed. Independent lines of research involving helioseismology and surface polar fields tend to support their conclusion.¹⁶⁵

This is ominous because such changes in sunspot activity heralded the beginning of the Little Ice Age. The *Voice of Russia* reported on April 22, 2013,

Global warming which has been the subject of so many discussions in recent years, may give way to global cooling. According to scientists from the Pulkovo Observatory in St. Petersburg, solar activity is waning, so the average yearly temperature will begin to decline as well. Scientists from Britain and the US chime in saying that forecasts for global cooling are far from groundless.¹⁶⁶

¹⁶³ This discussion is excerpted from Isaac Orr and Fred Palmer, "How Obama-Era Regulations Are Shutting Down Perfectly Good Power Plants," *Policy Study* No. 146, The Heartland Institute, November 20, 2017.

¹⁶⁴ Much of this discussion is excerpted from Peter Ferrara, "[To the Horror of Global Warming Alarmists, Global Cooling Is Here](#)," *Forbes* (website), May 26, 2013.

¹⁶⁵ Tony Phillips, "[Solar Variability and Terrestrial Climate](#)," *NASA Science News*, January 8, 2013.

¹⁶⁶ "[Cooling in the Arctic: What to Expect](#)," *Voice of Russia* (website), April 22, 2013.

That report quoted Yuri Nagovitsyn of the Pulkovo Observatory saying, “Evidently, solar activity is on the decrease. The 11-year cycle doesn’t bring about considerable climate change — only 1–2%. The impact of the 200-year cycle is greater — up to 50%. In this respect, we could be in for a cooling period that lasts 200–250 years.”¹⁶⁷ In other words, another Little Ice Age.

The *German Herald* reported on March 31, 2013,

German meteorologists say that the start of 2013 is now the coldest in 208 years — and now German media has quoted Russian scientist Dr Habibullo Abdussamatov from the St. Petersburg Pulkovo Astronomical Observatory [saying this] is proof as he said earlier that we are heading for a “Mini Ice Age.” Talking to German media the scientist who first made his prediction in 2005 said that after studying sunspots and their relationship with climate change on Earth, we are now on an “unavoidable advance towards a deep temperature drop.”¹⁶⁸

Belief in global warming fell sharply in Europe following increasingly severe winters. Christopher Booker explained in *The Sunday Telegraph* on April 27, 2013,

Here in Britain, where we had our fifth freezing winter in a row, the Central England Temperature record — according to an expert analysis on the US science blog Watts Up With That — shows that in this century, average winter temperatures have dropped by 1.45C, more than twice as much as their rise between 1850 and 1999, and twice as much as the entire net rise in global temperatures recorded in the 20th century.¹⁶⁹

A news report from India (*The Hindu*, April 22, 2013) stated, “March in Russia saw the harshest frosts in 50 years, with temperatures dropping to -25° Celsius in central parts of the country and -45° in the north. It was the coldest spring month in Moscow in half a century. ... Weathermen say spring is a full month behind schedule in Russia.”¹⁷⁰ The news report summarized,

Russia is famous for its biting frosts, but this year abnormally icy weather also hit much of Europe, the United States, China and India. Record snowfalls brought Kiev, capital of Ukraine, to a standstill for several days in late March, closed roads across many parts of Britain, buried thousands of sheep beneath six-metre deep snowdrifts in Northern Ireland, and left more than 1,000,000 homes without electricity in Poland. British authorities said March was the second coldest in its records dating back to 1910. China experienced the severest winter weather in 30 years and New Delhi in January recorded the lowest temperature in 44 years.¹⁷¹

¹⁶⁷ *Id.*

¹⁶⁸ Peter Ferrara, “[To the Horror of Global Warming Alarmists, Global Cooling Is Here](#),” *Forbes* (website), May 26, 2013.

¹⁶⁹ Christopher Booker, “[The Mercury Is Falling, But Our MPs Are Full of Hot Air](#),” *The Telegraph*, April 27, 2013.

¹⁷⁰ Vladimir Radyuhin, “[Down to Minus 45](#),” *The Hindu*, April 22, 2013.

¹⁷¹ *Id.*

Booker added, “[In early 2014] it was reported that 3,318 places in the USA had recorded their lowest temperatures for this time of year since records began. Similar record cold was experienced by places in every province of Canada. So cold has the Russian winter been that Moscow had its deepest snowfall in 134 years of observations.”¹⁷²

Britain’s Met Office, ardent supporters of the climate scare, conceded in December 2013 that there would be no further warming at least through 2017, which would make 20 years with no global warming. That reflects well the growing divergence between real-world observations and the projections of unvalidated climate models that form the foundation of the global warming alarmism of IPCC. BBC climate correspondent Paul Hudson wrote in January 2013,¹⁷³ “In the 12 years to 2011, 11 out of 12 [‘global temperature’] forecasts [of the Met Office] were too high—and... none were colder than [what was observed].”

Idso *et al.* write (*Why Scientists Disagree About Global Warming*): “Forward projections of solar cyclicity imply the next few decades may be marked by global cooling rather than warming, despite continuing CO₂ emissions.”¹⁷⁴

Is global climate returning to the conditions of the Little Ice Age? No one knows for sure but, on much longer-term cycles going back thousands of years, Earth is overdue for a return of a real, full glacial period.

N. Conclusion: While increased CO₂ concentrations probably have some effect in increasing “global temperatures,” natural causes are the dominant factors causing climate change. There is no prospect of catastrophic, human-caused global warming, and absolutely no foundation for the CPP.

Although rising concentrations of atmospheric carbon dioxide probably will have some effect on future temperatures, IPCC has greatly overestimated this influence.

The inability of climate models cited by the IPCC to accurately predict observed temperatures, coupled with the current “global-warming hiatus” during a period in which approximately one-third of all human-caused CO₂ emissions were released (see Figure 27), demonstrates the models used to justify CO₂ regulations do not match reality, and, therefore, constitute no basis for public policy.^{175,176}

¹⁷² Christopher Booker, “[The Mercury Is Falling, But Our MPs Are Full of Hot Air](#),” *The Telegraph*, April 27, 2013.

¹⁷³ Paul Hudson, “[Met Office Scale Back Global Warming Forecast](#),” *BBC* (website), January 8, 2013.

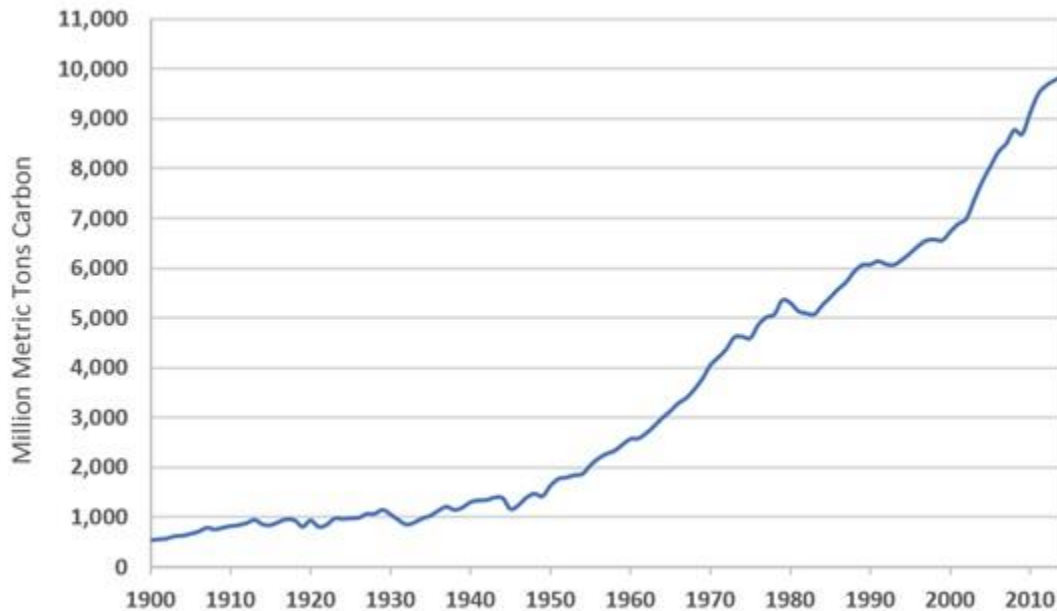
¹⁷⁴ Craig D. Idso *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, Ill: The Heartland Institute, 2016), p. 4.

¹⁷⁵ John C. Fyfe, *et al.*, “[Making Sense of the Early-2000s Warming Slowdown](#),” *Nature Climate Change*, February 24, 2016.

¹⁷⁶ T.A. Boden, *et al.*, “[Global, Regional, and National Fossil-Fuel CO₂ Emissions](#),” Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, 2015.

Additionally, approximately 0.4 degrees C of warming occurred before 1950. This means only 0.5 degrees C of warming has occurred since humans began to emit CO₂ into the atmosphere in any appreciable quantity. This provides further evidence supporting the conclusion that the models are predicting too much warming, and the likely impact of increasing CO₂ in the atmosphere on “global temperatures” is grossly overstated.

Figure 27
Global Carbon Emissions from Fossil Fuels, 1900–2014



Source: T.A. Boden *et al.*, “[Global Regional, and National Fossil-Fuel CO₂ Emissions](#),” Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, 2015.

EPA relied almost exclusively on IPCC “science” and models; if they are wrong, EPA is wrong, and there is no valid scientific basis for its conclusion that carbon dioxide and other greenhouse gas “pollution” endangers public health and welfare

The real threat to public health and welfare is the previous administration’s regulatory agenda, which would have slashed fossil fuel use and raised energy costs to catastrophic levels.

Policies that will so fundamentally and dramatically impact America’s energy sector, economy, living standards, lifestyles, health and welfare *absolutely have to be based on solid, incontrovertible evidence*. EPA’s case for its Clean Power Plan falls far short of this very fair and rational standard that the plan and anti-coal policies must be reversed.

For all of the foregoing reasons, the Heartland Institute respectfully submits that the Clean Power Plan should be repealed.

Respectfully submitted,

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Attachments for the Record

Isaac Orr and Fred Palmer, “How the Premature Retirement of Coal-Fired Power Plants Affects Energy Reliability, Affordability,” *Policy Study* No. 145, The Heartland Institute, February 2018.

Craig D. Idso, *et al.*, *Why Scientists Disagree About Global Warming: The NIPCC Report on Scientific Consensus* (Arlington Heights, Ill: The Heartland Institute, 2016).