Comments of the Attorneys General of New York, Massachusetts, California, Arizona, Connecticut, Colorado, Delaware, Hawaii, Illinois, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, North Carolina, Oregon, Rhode Island, Vermont, Washington, Wisconsin, and the District of Columbia, and the Chief Legal Officers of the City and County of Denver, Martin Luther King, Jr. County, Washington, and the Cities of Chicago and New York

on

A Critical Review of Impacts of Greenhouse Gas Emissions on the U.S. Climate
U.S. Department of Energy, Climate Working Group

DOE-HQ-2025-0207

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I. Introduction

The Attorneys General of New York, Massachusetts, California, Arizona, Connecticut, Colorado, Delaware, Hawaii, Illinois, Maine, Maryland, Michigan, Minnesota, New Jersey, New Mexico, North Carolina, Oregon, Rhode Island, Vermont, Washington, Wisconsin, and the District of Columbia, and the Chief Legal Officers of the City and County of Denver, Martin Luther King, Jr. County, Washington, and the Cities of Chicago and New York (together, the States and Local Governments) submit these comments on the Department of Energy's (DOE) Notice of Availability, 90 Fed. Reg. 36,150 (Aug. 1, 2025), regarding a report titled A Critical Review of Impacts of Greenhouse Gas Emissions on the U.S. Climate (CWG Report or Report), dated July 23, 2025. The Report was written by DOE's Climate Working Group (CWG) and published on DOE's website on July 29, 2025.

The rushed CWG Report flouts the law and the science and, if finalized, would be enormously harmful. Indeed, the U.S. Environmental Protection Agency (EPA) has already relied on an earlier draft of the Report as a basis for its proposed Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards, 90 Fed. Reg. 36,288, 36,292 n.10 (Aug. 1, 2025), which would upend motor vehicle greenhouse gas regulation in the United States and massively increase climate-harming emissions. And it appears that DOE plans to use the Report as the basis for other regulatory actions that increase emissions and worsen climate change, with devastating impacts on the States and Local Governments and the Nation as a whole.

An expansive body of peer-reviewed literature spanning several decades has firmly established that anthropogenic emissions of greenhouse gases are causing climate change, which endangers public health and welfare. This literature is well documented and summarized in numerous reports including the National Climate Assessments (NCAs) from the U.S. Global Change Research Program (USGCRP), and the Assessment Reports by the United Nations Intergovernmental Panel on Climate Change (IPCC). In stark contrast with the CWG Report, these reports involved years of work by thousands of scientists and were extensively peer-reviewed. As established through this literature, climate change is already endangering public health and welfare through rising temperatures, increases in extreme weather events, threats to our electricity grid and other infrastructure, increases in ozone and fine particle pollution, damages to fisheries and other marine life, and harms to agricultural production, among many other impacts. The States and Local Governments and their residents are already suffering devastating, life-threatening effects from climate change. These harms will dramatically worsen unless greenhouse gas emissions are dramatically reduced.

The CWG Report—written in less than two months—attempts to critique a wide swath of climate science and seeks to serve as the basis for policymaking in the federal government. But

the Report is both procedurally flawed and wrong on the science. First, DOE violated the Federal Advisory Committee Act (FACA) by creating the CWG without following FACA's required procedures. Additionally, DOE has impermissibly prejudged the outcome of the CWG Report, as shown through Secretary Wright's selection of five scientists known for their fringe perspective to write the Report, and by his and DOE's statements on the specific factual and policy issues addressed in the Report. DOE also violated scientific integrity policies issued pursuant to the Information Quality Act and the Open, Public, Electronic, and Necessary (OPEN) Government Data Act by neglecting to conduct a peer review of the Report and by failing to publish the data underlying the Report's analyses. Furthermore, the scientific, economic, and policy-based conclusions and analyses in the Report are unfounded and contradicted by the overwhelming weight of the relevant peer-reviewed research, including much of the research cited in the Report. The Report is riddled with inaccuracies, selective data presentation, data taken out of context, and misrepresentations of the literature and scientific consensus. It is not a report that meets any of the criteria for credible science research. Lastly, given the vastness and complexity of the scientific fields that the Report purports to cover, and DOE's failure to publish relevant data, DOE has failed to provide a sufficient opportunity to comment.

For these reasons, DOE must withdraw the CWG Report.

II. An enormous body of peer-reviewed science documents that human-caused emissions of greenhouse gases are driving climate change, and that climate change endangers public health and welfare.

The CWG Report entirely fails to engage the massive body of research documenting how anthropogenic emissions of greenhouse gases are altering atmospheric concentrations (causing climate change) and ocean chemistry (causing acidification). The Report similarly does not consider the harms to human health and welfare from climate change that have already occurred and the much more severe harms that will occur if greenhouse gas emissions continue unabated. Instead, the Report cherry picks topics and results conducive to the biased political narrative it presents, and misrepresents much of the research it discusses. And the Report inaccurately and

selectively presents the definitive and exhaustive findings regarding climate science and impacts captured in the NCAs[1] and the Assessment Reports from the IPCC.[2]

A. Scientists have documented, through multiple, independent lines of evidence, that human-caused emissions of greenhouse gases are rapidly warming the Earth, causing widespread changes in the atmosphere, ocean, cryosphere, and biosphere.

The physics of climate change are simple: greenhouse gases in the atmosphere trap outgoing radiation that would otherwise escape to space, thereby warming the Earth, like a blanket. We have understood this for more than a hundred and fifty years.[3] Humans—primarily by combusting fossil fuels—have added greenhouse gases to the atmosphere, and their

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[1] The NCAs are produced every four years pursuant to the Global Change Research Act of 1990, Pub. L. 101-606, 104 Stat. 3096 (1990), by the U.S. Global Change Research Program, an interagency program encompassing 15 federal government agencies. The first five NCAs (2000, 2009, 2014, 2017/2018, and 2023) were each created by hundreds of scientists over multiple years and represent the most comprehensive assessments of climate change science focused on the United States. *See, e.g.*, Allison R. Crimmins et al., U.S. Global Change Rsch. Program, Fifth National Climate Assessment (2023), https://repository.library.noaa.gov/view/noaa/61592 (NCA5).

[2] The IPCC was created by the World Meteorological Organization (WMO) and the United Nations to assess the science related to climate change. It is an organization of governments that are members of the United Nations or WMO. Experts volunteer their time to evaluate the scientific papers published each year to provide a comprehensive summary of what is known about the drivers of climate change, its impacts and future risks, and how adaptation and mitigation can abate those risks. Authors are selected based on their expertise. Each report is transparently reviewed by additional experts and the member governments. In each report, the IPCC identifies the strength of scientific agreement in different areas and indicates where further research is needed. *See* IPCC, What Is the IPCC? Fact Sheet (revised Jan. 2024), https://perma.cc/73YT-87H5. The experts who compile the IPCC reports consistently describe their confidence in specific findings based on agreement across the scientific community and the robustness of evidence, using the following confidence level terms: "very high" (strong evidence (established theory, multiple sources, well-documented and accepted methods, etc.)); "high" (moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.) and medium consensus); "medium" (suggestive evidence (a few sources, limited consistency, methods emerging, etc.) and competing schools of thought); and "low" (inconclusive evidence (limited sources, extrapolations, inconsistent findings, poor documentation and/or methods not tested, etc.) and disagreement or lack of opinions among experts and high consensus). Where possible, the IPCC provides a quantitative assessment of uncertainty with these terms: "virtually certain" (99-100% probability); "extremely likely" (95-100%); "very likely" (90-100%); "likely" (66-100%); "more likely than not" (>50-100%); "about as likely as not" (33-66%); "unlikely" (0-33%); "very unlikely" (0-10%); "extremely unlikely" (0-5%); and "exceptionally unlikely" (0-1%). *See* IPCC, Guidance Note for Lead Authors of the IPCC Fifth Assessment Report on Consistent Treatment of Uncertainties (July 2010), https://perma.cc/2MVT-8VDC. The NCAs use the same approach as the IPCC for describing or quantifying certainty. *See* NCA5 at xxiv.

[3] NASA, *Climate Change: Evidence* (last updated October 23, 2024), https://perma.cc/6KXQ-YSNF (NASA 2024).

increasing concentrations are readily measurable.[4] As atmospheric greenhouse gas concentrations rise, making the blanket thicker, less radiation escapes and warming increases.[5] Satellite measurements confirm that, as expected, less energy is outgoing than incoming at the top of the atmosphere.[6] Based on a comprehensive review of available data and research, the IPCC has concluded that "[i]t is unequivocal that human influence has warmed the atmosphere, ocean and land. Widespread and rapid changes in the atmosphere, ocean, cryosphere and biosphere have occurred."[7]

Specifically, "[o]bserved increases in well-mixed greenhouse gas (GHG) concentrations since around 1750 are unequivocally caused by human activities,"[8] and the increases are staggering. "In 2019, atmospheric CO_2 concentrations were higher than at any time in at least 2 million years (*high confidence*), and concentrations of CH_4 and N_2O were higher than at any time in at least 800,000 years (*very high confidence*). Since 1750, increases in CO_2 (47%) and CH_4 (156%) concentrations far exceed – and increases in N_2O (23%) are similar to – the natural multi-millennial changes between glacial and interglacial periods over at least the past 800,000 years (*very high confidence*)."[9] In 2024, global average CO_2 levels reached a new record (422.8 parts per million), with the annual global temperature across land and ocean the highest in the observational record dating back to 1850 (approximately 1.55°C above pre-industrial levels).[10] Although during the past 60 million years, "there have been periods in Earth's history when CO_2

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[4] *See Monthly Carbon Dioxide Concentration in the Atmosphere,* Met Off. Hadley Ctr.: Climate Dashboard, https://climate.metoffice.cloud/greenhouse_gases.html (archived at https://perma.cc/4HF9-M39U on Aug. 26, 2025) (showing three data sets measuring atmospheric concentrations).

[5] *NOAA Education and Outreach: Carbon Toolkit: Basics of the Carbon Cycle and the Greenhouse Effect*, NOAA Global Monitoring Lab'y, https://perma.cc/6D8A-ZWTF (archived Aug. 26, 2025).

[6] Norman G. Loeb et al., *Observational Assessment of Changes in Earth's Energy Imbalance Since 2000*, 45 Survs. in Geophysics 1757 (May 7, 2024), https://perma.cc/PP97-55VQ.

[7] Valérie Masson-Delmotte et al., eds., IPCC, Climate Change 2021: The Physical Science Basis: Contribution of Working Group I to the Sixth Assessment Report of the PCC, at 4, doi:10.1017/9781009157896.001, (2021) https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_FullReport.pdf (IPCC Physical Science AR6). The best summation of the science on anthropogenic climate change comes from IPCC Physical Science AR6, which reviewed and updated the science of global warming since the release of the IPCC's Fifth Assessment Report (AR5). The 2,391-page IPCC Physical Science AR6 was developed through a multi-year effort by hundreds of leading experts in the field of climate science and was peer-reviewed by governments and scientists.

[8] IPCC Physical Science AR6, *supra* note 7, at 4.

[9] *Id.* at 8.

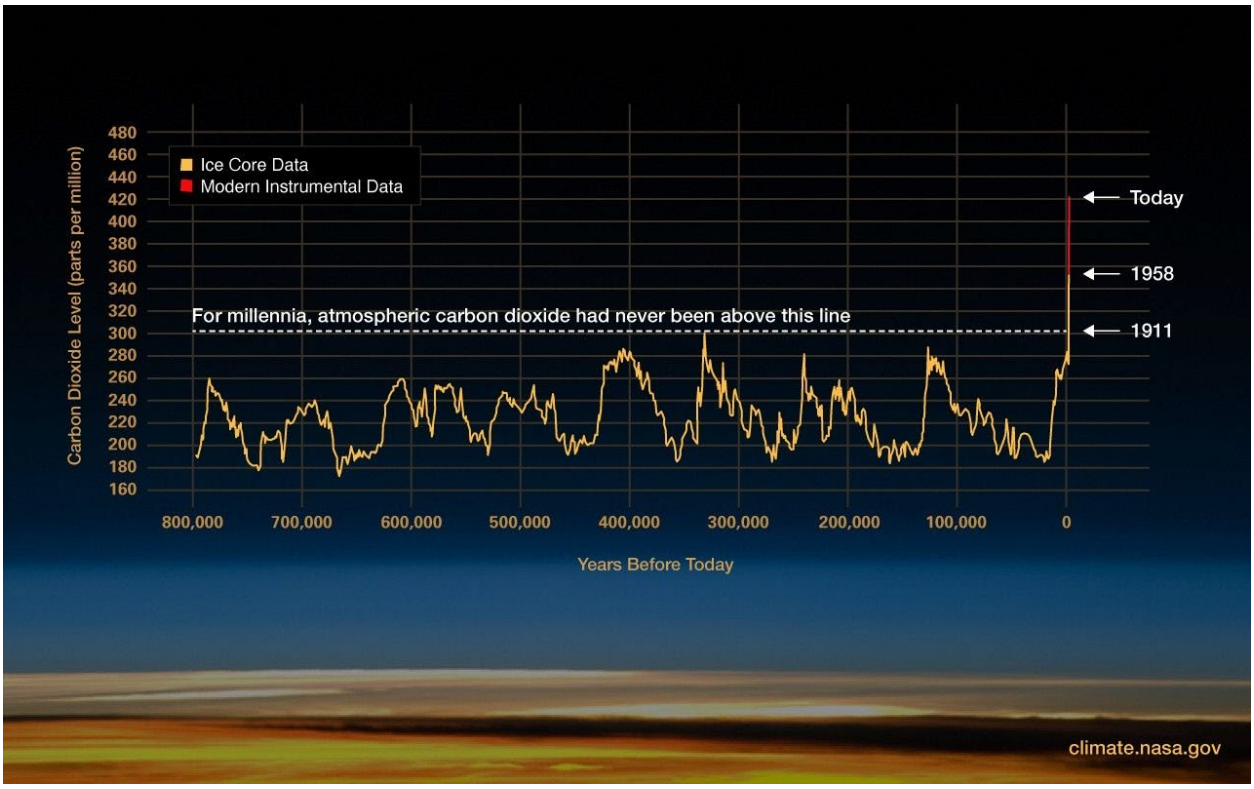
[10] J. Blunden et al., eds., *State of the Climate in 2024,* 106 (8) Bull. Am. Meteorological. Soc'y, at Siii (Aug. 2025), https://perma.cc/E746-XAN9; *WMO Confirms 2024 as Warmest Year on Record at about 1.55°C above Pre-Industrial Level*, World Meteorological Org., (Jan. 10, 2025), https://perma.cc/J8EQ-E7FB.

concentrations were significantly higher" than they are today, "multiple lines of evidence show that the rate at which CO_2 has increased in the atmosphere during 1900–2019 is at least 10 times faster than at any other time during the last 800,000 years (high confidence)."[11]

As shown in the figures below, the resulting warming is occurring rapidly and cannot be explained by natural climate dynamics alone.[12]

[11] IPCC Physical Science AR6, *supra* note 7, at 676.

[12] *See also* IPCC Physical Science AR6, *supra* note 7, Chapter 5, at 673–815 ("Multiple lines of evidence unequivocally establish the dominant role of human activities in the growth of atmospheric CO_2. First, the systematic increase in the difference between the [Mauna Loa] and [South Pole CO_2] records (Figure 5.6a) is caused primarily by the increase in emissions from fossil fuel combustion in industrialized regions that are situated predominantly in the Northern Hemisphere (Ciais et al., 2019). Second, measurements of the stable carbon isotope in the atmosphere ($d^{13}C–CO_2$) are more negative over time because CO_2 from fossil fuels extracted from geological storage is depleted in ^{13}C (Figure 5.6c; Rubino et al., 2013; Keeling et al., 2017). Third, measurements of the $d(O_2/N_2)$ ratio show a declining trend because for every molecule of carbon burned, 1.17 to 1.98 molecules of oxygen (O_2) is consumed (Figure 5.6d; Ishidoya et al., 2012; Keeling and Manning, 2014). These three lines of evidence confirm unambiguously that the atmospheric increase of CO_2 is due to an oxidative process (i.e., combustion). Fourth, measurements of radiocarbon ($^{14}C–CO_2$) at sites around the world (Levin et al., 2010; Graven et al., 2017; Turnbull et al., 2017) show a continued long-term decrease in the $^{14}C/^{12}C$ ratio. Fossil fuels are devoid of ^{14}C and therefore fossil fuel-derived CO_2 additions decrease the atmospheric $^{14}C/^{12}C$ ratio (Suess, 1955)."); NCA5, *supra* note 1, at 3-5.



NASA 2024, *supra* note 3 (citations omitted).[13]

Indeed, "[t]he *likely* range of total human-caused global surface temperature increase from 1850–1900 to 2010–2019 is 0.8°C to 1.3°C, with a best estimate of 1.07°C."[14] "Each of the last four decades has been successively warmer than any decade that preceded it since 1850."[15]

[13] "This graph, based on the comparison of atmospheric samples contained in ice cores and more recent direct measurements, provides evidence that atmospheric CO2 has increased since the Industrial Revolution." NASA 2024, *supra* note 3. Paleoclimate data (from ice cores, corals, marine and lake sediments, tree rings, borehole temperatures, and soils) "permit the reconstruction of climatic conditions before" the era of modern climate data collection. IPCC Physical Science AR6, *supra* note 7 at 158.

[14] IPCC Physical Science AR6, *supra* note 7, at 5.

[15] *Id.*

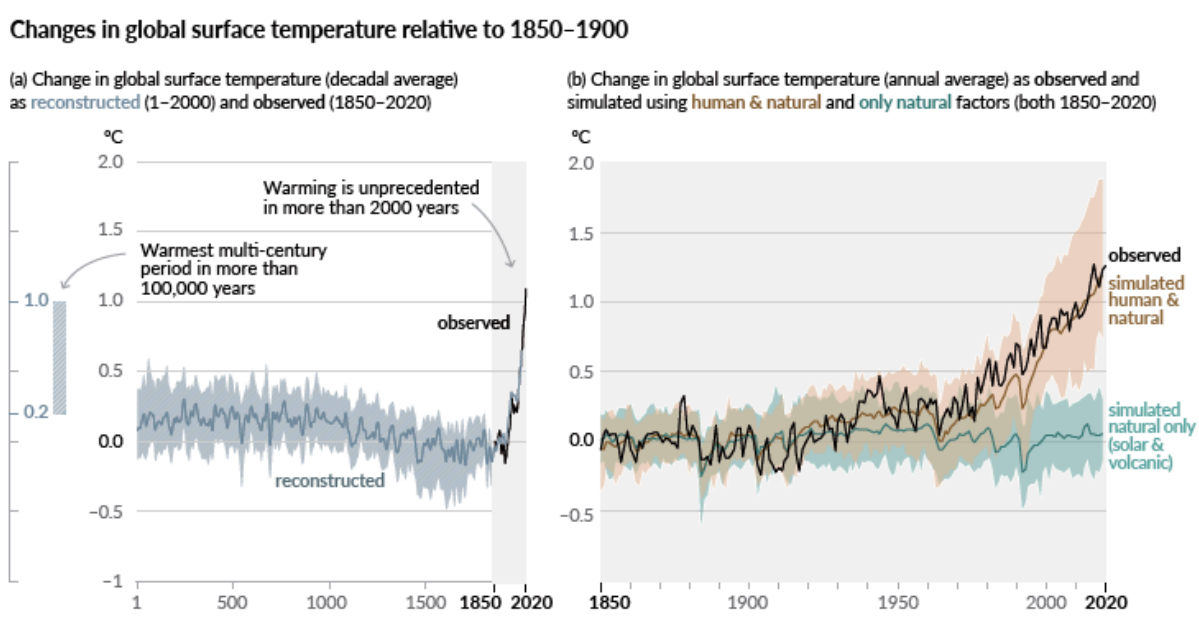


Figure SPM.1 | History of global temperature change and causes of recent warming

Panel (a) Changes in global surface temperature reconstructed from paleoclimate archives (solid grey line, years 1–2000) **and from direct observations** (solid black line, 1850–2020), both relative to 1850–1900 and decadally averaged. The vertical bar on the left shows the estimated temperature (*very likely* range) during the warmest multi-century period in at least the last 100,000 years, which occurred around 6500 years ago during the current interglacial period (Holocene). The Last Interglacial, around 125,000 years ago, is the next most recent candidate for a period of higher temperature. These past warm periods were caused by slow (multi-millennial) orbital variations. The grey shading with white diagonal lines shows the *very likely* ranges for the temperature reconstructions.

Panel (b) Changes in global surface temperature over the past 170 years (black line) relative to 1850–1900 and annually averaged, compared to Coupled Model Intercomparison Project Phase 6 (CMIP6) climate model simulations (see Box SPM.1) of the temperature response to both human and natural drivers (brown) and to only natural drivers (solar and volcanic activity, green). Solid coloured lines show the multi-model average, and coloured shades show the *very likely* range of simulations. (See Figure SPM.2 for the assessed contributions to warming).

{2.3.1; Cross-Chapter Box 2.3; 3.3; TS.2.2; Cross-Section Box TS.1, Figure 1a}

IPCC Physical Science AR6, *supra* note 7, at 6.

The warming is rapidly changing our planet with disastrous results. For example, the rate of ice-sheet loss is up four-fold from the period between 1992–1999 and the period of 2010–2019.[16] "Global mean sea level has risen faster since 1900 than over any preceding century in at least the last 3000 years (*high confidence*)."[17] "Ocean warming accounted for 91% of the heating in the climate system, with land warming, ice loss and atmospheric warming accounting for

[16] *Id.* at 11.

[17] *Id.* at 8.

about 5%, 3% and 1%, respectively (*high confidence*)."[18] Ocean acidification[19] "is strengthening as a result of the ocean continuing to take up CO_2 from human-caused emissions (*very high confidence*)," and the CO_2 uptake is driving decreasing pH and associated reductions in the saturation state of calcium carbonate—a constituent of skeletons or shells of a variety of marine organisms.[20] As a result, aragonite (a form of calcium carbonate) saturation has declined by a fifth in 40% of the global surface ocean and 60% of the subsurface ocean to a depth of 200 meters, resulting in a 43% reduction in suitable habitat for tropical and subtropical coral reefs, up to 61% for polar pteropods (sea snails), and 13% for coastal bivalves.[21]

Additionally, human-induced climate change is impacting many weather and climate extremes worldwide. Climate model projections of human-induced warming have largely been borne out by climate change in recent decades.[22] As the IPCC found in AR6 (2021), "[e]vidence of observed changes in extremes such as heatwaves, heavy precipitation, droughts, and tropical cyclones, and, in particular, their attribution to human influence, has strengthened since AR5 [2014]."[23] As a result, the world has already seen "widespread adverse impacts on food and water security, human health and on economies and society and related losses and damages to nature and people *(high confidence)*."[24]

B. Climate change impacts are already endangering human health and welfare throughout the United States.

As the Fifth National Climate Assessment found just two years ago, in the United States, "[o]bservations show an increase in the severity, extent, and/or frequency of multiple types of extreme events."[25] It is noteworthy that metrics tracking overall natural disasters in the United States are showing record-breaking costs in recent years. In 2023, the United States saw the most billion-dollar (Consumer Price Index-adjusted) disasters since the National Oceanic and

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[18] *Id.* at 11.

[19] Average ocean pH has declined by 30% since the industrial revolution. *See Ocean Acidification,* NOAA, https://perma.cc/S8AX-342R (last updated Feb. 25, 2025).

[20] IPCC Physical Science AR6, *supra* note 7, at 677.

[21] Helen Findlay et al., *Ocean Acidification: Another Planetary Boundary Crossed,* 31(6) Glob. Change Biology (June 9, 2025), https://perma.cc/E28M-25PQ.

[22] *See, e.g.*, Zeke Hausfather et al., *Evaluating the Performance of Past Climate Model Projections,* 47 (1) Geophysical Rsch. Letters, (Jan. 16, 2020), https://perma.cc/UME5-Q6GV.

[23] IPCC Physical Science AR6, *supra* note 7, at 8.

[24] Hoesung Lee et al., eds., IPCC, Climate Change 2023: Synthesis Report: Contribution of Working Groups I, II, and III to the Sixth Assessment Report of the IPCC at 42, doi: 10.59327/IPCC/AR6-9789291691647 (2023), https://perma.cc/S7GD-PQKH (IPCC Climate Change 2023 Synthesis Report AR6).

[25] NCA5, *supra* note 1, at 2-16.

Atmospheric Administration (NOAA) began keeping records in 1980. Strikingly, before 2016, the United States experienced just one year with more than 16 separate billion-dollar disaster events. But in the nine years between 2016 and 2024, the United States witnessed seven such years. And 2023 and 2024 had the most billion-dollar weather events yet; in 2023, there were 28 billion-dollar events.[26] In 2024, the United States saw a record 11 million people suffer internal displacement as a result of natural disasters, while the year also broke a global record for disaster-related displacements.[27] As NCA5 found:

> Heatwaves have become more common and severe in the West since the 1980s (*high confidence*). Drought risk has been increasing in the Southwest over the past century (*very high confidence*), while at the same time rainfall has become more extreme in recent decades, especially east of the Rockies (*very high confidence*). Hurricanes have been intensifying more rapidly since the 1980s (*high confidence*) and causing heavier rainfall and higher storm surges (*high confidence*). More frequent and larger wildfires have been burning in the West in the past few decades due to a combination of climate factors, societal changes, and policies (*very high confidence*).[28]

Nighttime temperatures are increasing in almost every region of the United States, which "can have a significant impact on human health, crop yields, and more."[29] And "floods, droughts, wildfires, extreme temperatures, and storms" are all "expected to increase in frequency, intensity, and extent."[30] These changes are threatening our infrastructure and electricity grid. NCA5 found as virtually certain, with very high confidence, that climate change is risking energy supply and delivery, damaging infrastructure and operations, and affecting human lives and livelihoods.[31] Climate impacts also pose "increased risks for road and other infrastructure, agricultural production, forests, biodiversity, carbon sinks, and human health (*high confidence*)."[32] And NCA5 also found very likely, with high confidence, that "severity and risk of coastal hazards . . . are increasing, driven by accelerating sea level rise and changing storm patterns, resulting in

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[26] *U.S. Billion-Dollar Weather and Climate Disasters, 1980–2024*, NOAA Nat'l Ctrs. for Env't Info., https://www.ncei.noaa.gov/access/metadata/landing-page/bin/iso?id=gov.noaa.nodc:0209268, archived at https://perma.cc/RUH5-DTET (last modified May 12, 2025).

[27] Chelsea Harvey, *Disasters Displaced a Record Number of People Last Year*, E&E News: Climatewire (May 13, 2025, 6:22 AM EDT), https://www.eenews.net/articles/disasters-displaced-a-record-number-of-people-last-year/ (attached as Exhibit A).

[28] NCA5, *supra* note 1, at 2-16.

[29] *Id.* at 2-18.

[30] *Id.* at 15-6.

[31] *Id.* at 5-4.

[32] *Id.* at 6-9.

increased flooding, erosion, and rising groundwater tables."[33] Indeed, between 2020 and 2050, contiguous U.S. coastal sea levels are expected to rise about 11 inches, with coastal flooding 5 to 10 times more frequent by 2050 in most locations.[34]

Climate change also has "profound negative effects on human health" including higher rates of heat-related morbidity and mortality; increases in the geographic range of some infectious diseases; greater exposure to poor air quality; increases in some adverse pregnancy outcomes; and higher rates of pulmonary, neurological, and cardiovascular diseases.[35] NCA5 projected with medium confidence that climate change will worsen air quality in many regions of the United States, and projected as very likely with high confidence that such changes will harm human health and increase premature death.[36]

Take wildfires as an example: the acute health risks posed solely through increasing exposure to wildfire smoke due to climate change are becoming increasingly apparent. Fine-

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[33] *Id.* at 9-5.

[34] *Id.*

[35] *Id.* at 15-6 (citing, e.g., Bruce Bekkar, MD, et al., *Association of Air Pollution and Heat Exposure with Preterm Birth, Low Birth Weight, and Stillbirth in the US: A Systematic Review*, 3 (6:e208243) JAMA Network Open, (June 18, 2020), https://perma.cc/E4AF-L5FN; Matthew Francis Chersich et al., *Associations Between High Temperatures in Pregnancy and Risk of Preterm Birth, Low Birth Weight, and Stillbirths: Systematic Review and Meta-Analysis*, 371 (m3811) Brit. Med. J. (Nov. 4, 2020), https://www.bmj.com/content/bmj/371/bmj.m3811.full.pdf; Christopher S. Malley et al., *Updated Global Estimates of Respiratory Mortality in Adults ≥ 30 Years of Age Attributable to Long-Term Ozone Exposure*, 125 (8) Env't Health Persps. (Aug. 28, 2017), 087021, https://perma.cc/8W8M-FK8G; Annette Peters & A. Schneider, *Cardiovascular Risks of Climate Change*, 18 (1-2) Nature Revs. Cardiology (Jan. 2021), https://doi.org/10.1038/s41569-020-00473-5 (attached as Exhibit B). *See also Climate Change Impacts: Climate Change and Human Health,* EPA, https://www.epa.gov/climateimpacts/climate-change-and-human-health (last updated Aug. 13, 2025); *see also* EPA, *Climate Change and Children's Health and Well-Being in the United States* 4, 7, 8 (Apr. 2023), https://perma.cc/KGQ9-G87C ("This report investigates five climate-related environmental hazards associated with children's health and well-being in the contiguous United States (U.S.): extreme heat, poor air quality, changes in seasonality, flooding, and different types of infectious diseases. . . . New diagnoses of asthma associated with $PM_{2.5}$ and O_3 exposure are estimated to increase by 34,500 (27,900 to 42,800) per year at 2°C of global warming up to 89,600 (74,100 to 108,000) at 4°C. . . . At 2°C of global warming, an additional 5,800 (4,800 to 8,000) asthma-related ED visits in children are anticipated annually from exposures to oak, birch, and grass pollen, increasing to approximately 10,000 (9,500 to 11,000) additional visits annually at 4°C of warming. . . . In 21 Eastern states and the District of Columbia, an additional 2,600 (-7,500 to 20,200) new Lyme disease cases per year are projected among children under 2°C of global warming. At 4°C of global warming, the increase is much more extreme: 23,400 (7,800 to 47,000) additional cases per year. These additional cases represent a 31% to 272% increase above baseline infection levels, respectively."); EPA, *Climate Change Indicators: Health and Society,* https://www.epa.gov/climate-indicators/health-society, archived at https://perma.cc/5EFM-MMNM (last updated Jan. 17, 2025); EPA, *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts* (Sept. 2021), https://perma.cc/6694-M3Y3.

[36] NCA5, *supra* note 1, at 14-5.

particle pollution from wildfire smoke can be far more toxic than fine-particle pollution from other sources.[37] A newly published analysis found that 15,000 wildfire particulate matter deaths in the United States between 2006 and 2020 were solely attributable to climate change.[38] Those 15,000 deaths also resulted in a cumulative economic burden of $160 billion.[39] And a recent analysis of wildfire smoke mortality in the United States projects that climate-driven increases in smoke $PM_{2.5}$ (particles that are generally 2.5 micrometers or less), even under a high-greenhouse gas mitigation and low global warming scenario, will cause 8,000 additional annual excess deaths in the United States in the 2050s than occurred during the last decade, and 690,000–720,000 cumulative excess deaths over the 2025–2055 period across low to high global warming levels.[40] This translates into annual damages of up to $244 billion by mid-century, comparable to the total estimates of monetizable harms from other climate impact categories in the United States in prior analyses.[41]

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[37] Rosana Aguilera et al., *Wildfire Smoke Impacts Respiratory Health More than Fine Particles from Other Sources: Observational Evidence from Southern California*, 12 (1493) Nature Commc'ns (Mar. 5, 2021), https://perma.cc/Q777-VLUZ.

[38] Beverly E. Law, et al., *Anthropogenic Climate Change Contributes to Wildfire Particulate Matter and Related Mortality in the United States,* 6 (336) Nature Commc'ns. Earth & Env't 1, 1–2, 3 (May 2, 2025), https://perma.cc/99PZ-74H8.

> Climate change has driven the observed increase in frequency and intensity of wildfires, which produce substantial amounts of fine particulate matter (wildfire $PM_{2.5}$). Exposure to $PM_{2.5}$ is a known cause of mortality and cardiovascular disease and is linked to onset and worsening of respiratory conditions. Ongoing trends of increasing wildfire severity align with climate projections and underscore how climate change factors such as earlier snowmelt, intensified heat waves, and rising vapor pressure deficit, have already expanded forest fire extent, accelerated daily fire growth rates, and enabled more extreme fire events. As climate change exacerbates wildfire risk, $PM_{2.5}$ emissions from wildfires have surged, contributing nearly half of the national annual average $PM_{2.5}$ across the US in recent years and reversing air quality improvements in several regions. Economic and environmental impacts of wildfires on both natural ecosystems and human communities will continue to increase as climate warming intensifies and extreme events become more frequent. . . . Over the 2006-2020 period of overlap between the available datasets of BA and wildfire $PM_{2.5}$, we estimate that climate change resulted in 39.0% more forest BA and 13.3% more nonforest BA than would have happened in its absence . . . .

Id. at 1–2. The excess, climate-caused mortality impacts in the most-impacted counties (9.8–17.1 per 100,000 people) rival those of cancer (17.5 (2021) and 18.5 (2022))—the second leading cause of death in the United States. *Id.* at 3. Independent analyses have found similar mortality and economic burden results. *Id* at 2.

[39] *Id.* at 1, 2, 5.

[40] Minghao Qiu et al., *Mortality Burden from Wildfire Smoke under Climate Change*, Nat'l Bureau of Econ. Rsch., Working Paper No. 32307 (Apr. 2024), https://doi.org/10.3386/w32307 (attached as Exhibit C).

[41] *Id.*

Both methane emissions and ocean acidification are also causing public health and economic harms separately from rising global temperatures. Methane contributes to tropospheric ozone formation, and exposure to ozone (smog) is associated in epidemiologic studies with increased hospital admissions and premature mortality (as well as agricultural crop losses).[42] The net present value of the increase in mortality from methane-ozone effects is estimated at $1800 per ton of methane (95% confidence interval: $760-2800/mt$CH_4$). Ocean acidification has been correlated with population decline in the southeast Bering Sea red king crab, caused a $110 million loss for shellfish hatcheries in the Pacific Northwest in the late 2000s, and is impacting the shells and sensory organs of young Dungeness crabs in the Pacific Northwest.[43]

Climate change also harms agricultural production and food and nutritional security. As the IPCC found, "climate change has generally reduced agricultural productivity by 12.5% since 1961" across North America, "with progressively greater losses moving south from Canada to Mexico and in drought-prone rain-fed systems (*high confidence*) while favourable conditions increased yields of maize, soybeans in regions like the USA Great Plains." [44] The effects of climate change will "intensify production losses of key crops (*high confidence*), livestock (*medium confidence*), fisheries (*high confidence*) and aquaculture products (*medium confidence*)."[45]

Climate change is also expected to reduce catch in all U.S. fisheries regions, and cause between $2 billion in economic losses (assuming aggressive GHG mitigation) and $4.2 billion (assuming low GHG mitigation) by 2100.[46]

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[42] Erin E. McDuffie et al., *The Social Cost of Ozone-Related Mortality Impacts from Methane Emissions,* 11(9) Earth's Future (Sept. 2023), https://perma.cc/7PX3-G53C.

[43] Theo Stein et al., *Study Finds Ocean Acidification Is More Pervasive than Previously Thought,* NOAA Ocean Acidification Program News (June 11, 2025), https://perma.cc/9U5C-VFXT.

[44] Hans-Otto Pőrtner et al., eds., IPCC, Climate Change 2022: Impacts, Adaptation, and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the IPCC at 1956, 1931–32, https://www.ipcc.ch/report/ar6/wg2/ (citations omitted), (IPCC Impacts AR6); *see also id.* at 1974 ("Economic models generally show economic losses in the agricultural sector across North America, especially at higher [global warming levels], although the effects in local economies, especially rural areas of the USA that are highly dependent on agriculture, will be substantial even at lower [global warming levels.") (citations omitted).

[45] *Id.* at 1931–32.

[46] NCA5, *supra* note 1, at 10-12; Chris Moore et al., *Estimating the Economic Impacts of Climate Change on 16 Major US Fisheries,* 12(1) Climate Change Econs. (Feb. 2021), https://perma.cc/CM63-Y58Q.

Unsurprisingly given these findings, "estimates of nationwide impacts indicate a net loss in the economic well-being of American society."[47] "Climate-related hazards will continue to grow, increasing morbidity and mortality across all regions of the US (*very likely, very high confidence*)."[48] The economic and health effects of climate change compound each other, with disproportionate effects on under-resourced individuals and communities.[49]

C. The States and Local Governments are suffering acute climate harms.

The floods, droughts, wildfires, extreme temperatures, and storms plaguing the nation are prevalent throughout the country and causing catastrophic damage that is only expected to increase, as detailed in the attached Appendix 1. This subsection highlights just a few examples of these harms:

- In Northern California, a September 2022 heatwave reached record-breaking temperatures in 1,500 distinct places.[50] In Sacramento, temperatures "reached 116°F (46.7°C), their highest temperatures since record-keeping began in 1899 . . . . The Sacramento record, which was previously 110°F (43.3°C), was broken by a significant margin."[51] 395 deaths were traced to this heatwave.[52]

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[47] NCA5, *supra* note 1, at 19-6 (citing Solomon Hsiang et al., *Estimating Economic Damage from Climate Change in the United States*, 365 (6345) Sci. 1362–69 (June 30, 2017), https://www.science.org/doi/10.1126/science.aal4369 (attached as Exhibit D); Ashwin Rode et al., *Estimating a Social Cost of Carbon for Global Energy Consumption,* 598 (7880) Nature 308–314 (Oct. 13, 2021), https://doi.org/10.1038/s41586-021-03883-8 (attached as Exhibit E); Ashwin Rode et al., Climate Impact Lab, Labor Disutility in a Warmer World: The Impact of Climate Change on the Global Workforce, 1–96 (Sept. 16, 2022), https://perma.cc/FZQ8-WEK2; Andrew Hultgren et al., Estimating Global Impacts to Agriculture from Climate Change Accounting for Adaptation 1–112 (Apr. 9, 2025) https://perma.cc/RR7K-4ZBA; Tamma Carleton et al., *Valuing the Global Mortality Consequences of Climate Change Accounting for Adaptation Costs and Benefits*, 137 (4) Q. J. Econ. 2037–2105 (Nov. 2022), https://doi.org/10.1093/qje/qjac020 (attached as Exhibit F); Jeremy Martinich & Allison Crimmins, *Climate Damages and Adaptation Potential Across Diverse Sectors of the United States*, 9 (5) Nature Climate Change 397–404 (Apr. 8, 2019), https://doi.org/10.1038/s41558-019-0444-6 (attached as Exhibit G)); *see also id.* at 19-20 ("Most of the [cited] papers find an asymmetric relationship with regard to temperature, where being too hot is worse than being too cold. Hence, the effect of an increase in extreme heat is the dominant driver for most places in the US leading to a net [economic] loss.").

[48] NCA5, *supra* note 1, at 15-6.

[49] *Id.* at 15-6, 15-7, 15-12.

[50] Cal. Dep't of Pub. Health, Excess Mortality During the September 2022 Heat Wave in California, at 4 (Aug. 2023), https://perma.cc/922C-EGLT.

[51] *A Long-Lasting Western Heatwave*, NASA Goddard Space Flight Ctr.: EOS Project Sci. Off.: NASA Earth Observatory (Sept. 6, 2022), https://perma.cc/5NLP-Y92A.

[52] Cal. Dep't of Pub. Health, *supra* note 50, at 3.

- In the Pacific Northwest, a 2021 heatwave "shattered" temperature records, with "all-time highs of . . . 108°F (42°C) in Seattle, Washington."[53] The temperature hit 115°F in Portland, Oregon, where during that time of year the typical temperature is 73°F.[54] These soaring temperatures ruined crops and caused roads to buckle.[55] "The heatwave led to more than 1,400 heat-related deaths, another severe wildfire season, mass die-offs of fishery species important to the region's economy and Indigenous communities, and total damages exceeding $38.5 billion."[56] A literature review of studies about the heat event found that "between 5 and 20% of the heat wave's magnitude can be attributed to climate change."[57]

- In late September 2024, Hurricane Helene brought torrential rain to Western North Carolina, exceeding previous records for rainfall in the region and causing catastrophic and unprecedented damage.[58] North Carolina experienced over 30 inches of rainfall in some locations, and more than a thousand landslides.[59] As of June 17, 2025, there were 108 verified deaths in North Carolina due to Helene.[60] NOAA's National Centers for Environmental Information estimates that Helene has caused $78.7 billion in damage.[61]

- In 2024, Phoenix, Arizona, experienced a record-breaking 70 days with temperatures at or above 110°F, and the city reached 100°F for 113 consecutive days, another record.[62]

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[53] Emily Bercos-Hickey et al., *Anthropogenic Contributions to the 2021 Pacific Northwest Heatwave*, 49 (23) Geophysical Rsch. Letters 1 (2022), https://perma.cc/BJC4-GFHT.

[54] Neil Vigdor, *Pacific Northwest Heat Wave Shatters Temperature Records*, N.Y. Times (Jun. 29, 2021; updated June 29, 2021), https://www.nytimes.com/2021/06/27/us/heat-wave-seattle-portland.html (attached as Exhibit H).

[55] Emily Bercos-Hickey, *supra* note 53, at 1.

[56] NCA5, *supra* note 1, at 1-19.

[57] S. Karin, *A New Paper Synthesizing Studies on the June 2021 Pacific Northwest Heat Wave Now Available*, Climate Matters Newsl. (Wash. State Climate Off.), July 8, 2025, https://perma.cc/5FW7-T8VD.

[58] Andrew B. Hagen et al., NOAA Nat'l Hurricane Ctr., National Hurricane Center Tropical Cyclone Report: Hurricane Helene (AL092024) 24-27 September 2024 1, 14–17, 22–26 (Apr. 8, 2025), https://perma.cc/4878-Z9TC.

[59] *Id*. at 14, 22–24.

[60] *Hurricane Helene Storm Related Fatalities*, N.C. Dep't of Health & Human Servs., https://perma.cc/3AG7-23MA (archived Aug. 27, 2025).

[61] Hagen et al., *supra* note 58, at 19.

[62] Hayleigh Evans, *Arizona Weather Wrapped: A Broken Record of Broken Records in Phoenix During 2024*, Ariz. Republic (Dec. 21, 2024, 6:02 AM MT), https://perma.cc/KV7Q-YASW.

- Since 2000, the Southwest has experienced a "megadrought"—defined as "an episode of intense aridity that persists for multiple decades"—that is recognized as the driest two decades in 1,200 years.[63] This drought has "drastically shrunk the Colorado River, which provides water for drinking and irrigation" to over 40 million people in seven states, 30 tribes, and Mexico.[64]

- The 2021 drought in California "cost California farming sectors an estimated $1.28 billion (in 2022 dollars)" and "the loss of 8,745 full- or part-time jobs."[65] California's almond industry—which produces 80% of the world's supply—experienced a yield 10% lower than the preceding year.[66]

- Since the 2010s, when Tropical Storm Lee, Hurricane Irene, and Hurricane Sandy collectively killed over 50 people and caused billions of dollars in damage, New York has continued to experience an increase in the intensity, duration, and frequency of hurricanes and tropical storm events. Tropical Storm Henri and Hurricane Ida occurred within two weeks of each other in 2021. Tropical Storm Henri broke several meteorological records in New York City, including the biggest two-day rainfall event since Hurricane Irene with 7.04 inches total.[67] Eight days later, Hurricane Ida shattered many of these records. Some parts of the City experienced 3.15 inches of rainfall in one hour, and the National Weather Service issued the first ever flash flood emergency for New York City.[68] In total,

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[63] A. Park Williams et al., *Rapid Intensification of the Emerging Southwestern North American Megadrought in 2020–2021*, 12 (3) Nature Climate Change 232–34 (Feb. 2022) https://doi.org/10.1038/s41558-022-01290-z (attached as Exhibit I).

[64] Jennifer Weeks, *The Colorado River Drought Crisis: 5 Essential Reads,* The Conversation (Apr. 13, 2023, 8:26 AM EDT), https://perma.cc/N646-N4LK; *"Mega-drought" Takes Dramatic Toll on Colorado River System that Provides Water to 40 Million People*, CBS News: CBS Mornings (June 9, 2021, 7:05 AM EDT), https://perma.cc/LG5R-TGX3; *National Conditions: Colorado*, NOAA Nat'l Integrated Drought Info. Sys., https://perma.cc/4C3E-3C5H (archived Aug. 27, 2025).

[65] NCA5, *supra* note 1, at 28-19.

[66] Adeel Hassan, *The Plains and Upper Midwest Are Growing Drier As Drought Deepens in the West*, N.Y. Times (Aug. 23, 2022; updated Aug. 23, 2022), https://www.nytimes.com/2021/08/25/us/drought.html (attached as Exhibit J).

[67] Andy Newman & Ellen Barry, *Tropical Storm Henri Brings Power Outages and Record Rain to Northeast*, N.Y. Times (Aug. 22, 2021; updated Oct. 28, 2021), https://www.nytimes.com/2021/08/22/nyregion/tropical-storm-henri.html?searchResultPosition=1 (attached as Exhibit K).

[68] Jesus Jiménez, *New York City Faces the First 'Flash Flood Emergency' in Its History*, N.Y. Times (Sept. 2, 2021; updated Nov. 12, 2021), https://www.nytimes.com/2021/09/02/nyregion/new-york-city-faces-the-first-flash-flood-emergency-in-its-history.html (attached as Exhibit L).

Hurricane Ida caused 17 deaths in New York and 7.5 billion dollars' worth of damage, including flood damage to 11,000 homes.[69]

- Illinois experienced twelve weather and climate disasters in 2024 that caused over a billion dollars of damage each—the most in Illinois since NOAA's record keeping began in 1980.[70] Nine of these disasters were severe storm events, also the most since 1980. These storms included a July 15, 2024, "derecho" that produced 100 mile-per-hour winds and 48 separate tornados.[71] In the Chicago area alone, the derecho produced 32 tornados, breaking the previous records set by the July 2014 "double derecho" and March 2023 storm.[72]

- A series of heavy rain and flooding events occurred over New England in July 2023 dumped as much as 9 inches of rain on Vermont, at a time when rivers were high and soils were saturated from prior storms.[73] That storm caused catastrophic flooding in downtown Montpelier, the state's capital, and numerous other cities and towns. One year later, on July 10–11, 2024, tropical cyclone Beryl led to heavy localized rainfall and riverine and flash flooding across northeastern and northwestern Vermont.[74] Rainfall exceeded 7 inches, with heavy thunderstorms resulting in heavy winds and large hail up

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[69] Press Release, Kathy Hochul, N.Y. State Governor, Governor Hochul Announces Hurricane Ida Recovery Action Plan to Assist New Yorkers Impacted by Deadly Storm (Aug. 29, 2022), https://perma.cc/B6DH-RYXU; Ariel Yuan et al., *Immediate Injury Deaths Related to the Remnants from Hurricane Ida in New York City, September 1-2, 2021*, 18 (e55) Disaster Med. & Pub. Health Preparedness, (Apr. 5, 2024), https://perma.cc/LDE2-U8XM; Human-caused sea level rise increased the total cost of Superstorm Sandy by $8 billion. *See* Benjamin H. Strauss et al., *Economic Damages from Hurricane Sandy Attributable to Sea Level Rise Caused by Anthropogenic Climate Change,* 12 (2720) Nature Commc'ns (May 18, 2021), https://perma.cc/DPX4-DCJA.

[70] *Billion-Dollar Weather and Climate Disasters: Illinois Summary,* NOAA: Nat'l Ctrs. for Env't Info., https://perma.cc/G5NV-WTFV (archived Aug. 27, 2025). Notably, the current Administration will cease recording billion-dollar weather incidents.

[71] *July 15, 2024: Derecho Produces Widespread Wind Damage and Numerous Tornadoes,* NOAA Nat'l Weather Serv.: Chi., Ill. Weather Forecast Off., https://perma.cc/YWR7-M4UW (archived Aug. 27, 2025); *see also* David Struett, *Tornado Record Broken with 27 Chicago Area Twisters July 15—Spawned by 'Ring of Fire'*, WBEZ: Chi. Pub. Media (July 24, 2024, 8:34 AM EDT), https://www.wbez.org/weather/2024/07/24/chicago-weather-tornado-record-derecho-july-15 (attached as Exhibit M).

[72] *Id.*

[73] Seven Days Staff, *'Historic and Catastrophic': Unrelenting Rain Swamped Vermont's Cities, Towns and Hamlets. The Recovery is Just Beginning*, Seven Days (July 13, 2023, 10:44 PM; updated July 19, 2023, 9:56 AM), https://perma.cc/NR4Y-8YLC.

[74] John Goff et al., *The Significant Flooding and Severe Weather Event of 10-11 July 2024*, NOAA Nat'l Weather Serv.: Burlington, Vt. Weather Forecast Off. (Aug. 10, 2024, 9:45 PM), https://perma.cc/WR6W-YGB2.

to 1.5 inches in diameter. More than 100 evacuations were conducted by first responders, and at least two deaths are believed to have been caused by the flooding.[75]

- In 2012 Superstorm Sandy brought strong winds, record storm tide levels, flooding of some coastal areas, and loss of power for 385,000 Massachusetts residents.[76] Massachusetts suffered an estimated $300 million in property losses alone.[77] In January 2018, the storm surge from a powerful winter storm caused major coastal flooding and resulted in a high tide in Boston of 15.16 feet, the highest tide since records began in 1921.[78] Two months later, a March 2018 coastal storm resulted in a 14.67 foot tide in Boston, the third-highest on record.[79] That March 2018 coastal storm damaged 2,113 homes, including destroying 147 homes, and caused more than $24 million in flood damage across six Massachusetts coastal counties.[80] In Massachusetts, by 2050, sea levels along the southern coastal region are expected to rise over 2 feet, which will cause over 25 miles of road and more than 1,400 buildings in the region to flood every day at high tide.[81]

- States across the United States have experienced an average of 18 percent decline in snowpack between 1950 and 2023, with especially pronounced declines in Washington, Oregon, and Northern California.[82] Not only does reduced snowpack impact tourism and

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[75] Jenna Russell, *Flash Flooding Leads to Evacuations and Rescues in Central Vermont*, N.Y. Times (July 11, 2024), https://www.nytimes.com/2024/07/11/us/vermont-flood.html (attached as Exhibit N).

[76] Jennifer Runkle et al., NOAA Nat'l Ctrs. for Env't Info., State Climate Summaries 2022: Massachusetts State Climate Summary, at 3–4 (2022), https://statesummaries.ncics.org/downloads/Massachusetts-StateClimateSummary2022.pdf.

[77] *Id.*

[78] Martin Finucane, *It's Official: Boston Breaks Tide Record*, Boston Globe (Jan. 5, 2018, 11:36 AM), https://www.bostonglobe.com/metro/2018/01/05/official-boston-breaks-tide-record/UPbwDxgF0QXNOWvB9bcQ7L/story.html (attached as Exhibit O).

[79] Christina Prignano, *The Noon High Tide Was Bad, but the Midnight High Tide Could Be Worse,* Boston Globe (Mar. 2, 2018, 1:09 PM), https://www.bostonglobe.com/metro/2018/03/02/the-noon-high-tide-was-bad-but-midnight-high-tide-will-worse/m4O1PR8HRIoLsmx3mp2YvO/story.html (attached as Exhibit P).

[80] Christian M. Wade, *Baker Seeks Federal Disaster Funds for Storm Damages*, Lawrence Eagle-Trib. (May 1, 2018; updated July 9, 2025), https://www.eagletribune.com/news/merrimack_valley/baker-seeks-federal-disaster-funds-for-storm-damages/article_d2f0c7b4-bd75-5a8b-8a0c-4dedbe44a7b4.html (attached as Exhibit Q).

[81] Barbara Moran, *Rising Seas Threaten Mass. South Coast and Prosperous Fishing Port, Report Finds. Here Are 5 Takeaways,* WBUR.org (Sep. 19, 2022), https://perma.cc/TW3T-CVET.

[82] *Climate Change Indicators: Snowpack,* EPA (last updated Aug. 25, 2025), https://perma.cc/9PFY-PXPQ; *see also* Alexander R. Gottlieb & Justin S. Mankin, *Evidence of Human Influence on Northern Hemisphere Snow Loss*, 625 Nature 293–300 (Jan. 10, 2024), https://perma.cc/J6RK-TCAD.

winter sport economies, but it also alters the volume and timing of streamflow that affects hydropower, irrigation, and availability of drinking water and increases the risk of wildfires.[83]

- Coral reefs are currently undergoing the most severe bleaching event in history; ocean temperatures are rising such that *80%* of all corals on a reef are at risk of dying due to prolonged bleaching.[84] Coral reefs sustain upwards of $10 trillion in value in connection with food, jobs, and coastal protection.[85] Similarly, abundant kelp forests like those off the coasts of California, Oregon and Washington State generate "an average of $500 billion" annually, considering the fisheries that kelp forests support, and the excess nutrients (which can be dangerous in large quantities)[86] that kelp forests absorb.[87] Climate change is exacting a toll on kelp forests around the globe.[88]

The less that is done now to reduce anthropogenic greenhouse gas emissions, the greater the magnitude of future damages from climate change. The IPCC reaffirmed in AR6 "with *high confidence* the AR5 finding that there is a near-linear relationship between cumulative anthropogenic CO_2 emissions and the global warming they cause. . . . Every tonne of CO_2 emissions adds to global warming."[89] Emphasizing the importance of reducing greenhouse gas emissions now, the IPCC found that "[g]lobal warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades."[90]

The consequences of not reducing greenhouse gases rapidly are stark. As the IPCC noted with very high confidence, "[t]he more the planet warms, the greater the impacts . . . and the greater the risk of unforeseen consequences"; "the impacts of climate change increase with warming, and warming is *virtually certain* to continue if emissions of carbon dioxide do not

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[83] *Id*.; *see also* NCA5, *supra* note 1, at 1-23.

[84] *84% of the World's Coral Reefs Impacted in the Most Intense Global Coral Bleaching Event Ever,* International Coral Reef Initiative (Apr. 23, 2025), https://perma.cc/8EVD-QM8S.

[85] *Id*.

[86] *Basic Information on Nutrient Pollution*, EPA (last updated Apr. 22, 2025), https://perma.cc/NX3B-RZM6.

[87] Aaron Eger et al., *The Value of Ecosystem Services in Global Marine Kelp Forests*, 14 (1894) Nature Commc'ns 1, 6 (Apr. 18, 2023), https://perma.cc/W39L-L6NL.

[88] Dan A. Smale, *Impacts of Ocean Warming on Kelp Forest Ecosystems*, 225 (4) New Phytologist 1447-1454 (Feb. 2020), https://perma.cc/XJS6-EZFQ; NCA5, *supra* note 1, at 8-9.

[89] IPCC Physical Science AR6, *supra* note 7, at 28.

[90] IPCC Physical Science AR6, *supra* note 7, at 14.

reach net zero."[91] On the other hand, "[r]apidly reducing emissions would *very likely* limit future warming . . . and the associated increases in many risks."[92] Moreover, the United States is expected to experience higher temperature increases than the average: For every additional 1ºC of global warming, the average temperature in the United States is predicted to increase by 1.4ºC (2.5ºF).[93]

Curbing greenhouse gas emissions is also key to addressing extreme weather and conditions.[94] That is because with every additional increment of global warming, changes in extremes continue to become larger:

> [E]very additional 0.5°C of global warming causes clearly discernible increases in the intensity and frequency of hot extremes, including heatwaves (*very likely*), and heavy precipitation (*high confidence*), as well as agricultural and ecological droughts in some regions (*high confidence*). . . . There will be an increasing occurrence of some extreme events unprecedented in the observational record with additional global warming, even at 1.5°C of global warming.[95]

> Climate hazards are projected to intensify further across North America (*very high confidence*). Heatwaves over land and in the ocean, as well as wildfire activity, will intensify; subarctic snowpack, glacial mass and sea ice will decline (*virtually certain*); and sea level rise will increase at geographically differential rates (*virtually certain*). Humidity-enhanced heat stress, aridification and extreme precipitation events that lead to severe flooding, erosion, debris flows and ultimately loss of ecosystem function, life and property are projected to intensify (*high confidence*). [] Health risks are projected to increase this century under all future emissions scenarios (*very high confidence*).[96]

Curbing greenhouse gases is also critical to reduce the likelihood of triggering climate tipping points. To begin, the IPCC determined that "[l]ow-likelihood, high-impact outcomes could occur at global and regional scales even for global warming within the *very likely* range for

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[91] NCA5, *supra* note 1, at 2-21.

[92] *Id.*

[93] *Id.*

[94] *Id.* at 2-24; *see also* IPCC Physical Science AR6, *supra* note 7, at 15 ("Many changes in the climate system become larger in direct relation to increasing global warming. They include increases in the frequency and intensity of hot extremes, marine heatwaves, heavy precipitation, and, in some regions, agricultural and ecological droughts; an increase in the proportion of intense tropical cyclones; and reductions in Arctic sea ice, snow cover and permafrost.").

[95] IPCC Physical Science AR6, *supra* note 7, at 15 (footnote omitted).

[96] IPCC Impacts AR6, *supra* note 44, at 1932.

a given GHG emissions scenario" and that "[t]he probability of low-likelihood, high-impact outcomes increases with higher global warming levels (*high confidence*)."[97] These tipping points, "such as strongly increased Antarctic ice-sheet melt and forest dieback, cannot be ruled out (*high confidence*)[,]"[98] and their impacts could be devastating.[99]

Furthermore, the proportion of greenhouse gas emissions absorbed by the ocean and the land is expected to decline, resulting in greater accumulation of greenhouse gases in the atmosphere.[100] And despite the wide range of model projections of land and ocean carbon sink capacity, "uncertainty in atmospheric CO_2 by 2100 is dominated by future anthropogenic emissions rather than uncertainties related to carbon–climate feedbacks (*high confidence*)."[101] In other words, the strength of the greenhouse gas effect in the atmosphere in 2100 will be determined primarily by future anthropogenic greenhouse gas emissions—not by the behavior of other components of the carbon cycle.

In sum, massive quantities of peer-reviewed science show that human-induced rising atmospheric levels of greenhouse gases are resulting in climate change, these greenhouse gas emissions are endangering human health and welfare, and the harms will intensify with increased emissions, as repeatedly determined in prior evaluations of greenhouse gas endangerment by

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[97] IPCC Physical Science AR6, *supra* note 7, at 27.

[98] IPCC Physical Science AR6, *supra* note 7, at 27.

[99] *See, e.g.*, Vivien Gornitz et al., *New York City Panel on Climate Change 2019 Report Chapter 3: Sea Level Rise,* 1439 Annals N.Y. Acad. Scis. 71–94 (2019), https://perma.cc/RS5R-CFSW.

[100] IPCC Physical Science AR6, *supra* note 7, at 677.

[101] IPCC Physical Science AR6, *supra* note 7, at 677.

EPA,[102] peer-reviewed research,[103] federal government scientific and national security entities,[104] and medical practitioner and health organizations.[105]

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[102] *See, e.g.,* Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 66,496 (Dec. 15, 2009); EPA's Denial of the Petitions to Reconsider the Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Aire Act, 75 Fed. Reg. 49,556 (Aug. 13, 2010); Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act; Final Action on Petitions, 87 Fed. Reg. 25,412 (Apr. 29, 2022); Finding That Greenhouse Gas Emissions From Aircraft Cause or Contribute to Air Pollution That May Reasonably Be Anticipated To Endanger Public Health and Welfare, 81 Fed. Reg. 54,422 (Aug. 15, 2016); Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review, 89 Fed. Reg. 16,820, 16,837 (Mar. 8, 2024); New Source Performance Standards for Greenhouse Gas Emissions From New, Modified, and Reconstructed Fossil Fuel-Fired Electric Generating Units; Emission Guidelines for Greenhouse Gas Emissions From Existing Fossil Fuel-Fired Electric Generating Units; and Repeal of the Affordable Clean Energy Rule, 89 Fed. Reg. 39,798, 39,807–10 (May 9, 2024); Greenhouse Gas Emissions Standards for Heavy-Duty Vehicles-Phase 3, 89 Fed. Reg. 29,440, 29,475 (Apr. 22, 2024); Standards of Performance for Greenhouse Gas Emissions From New, Modified, and Reconstructed Stationary Sources: Electric Utility Generating Units, 80 Fed. Reg. 64,510, 64,517–22, 64,530–31 (Oct. 23, 2015); *see also, e.g.,* Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule, 75 Fed. Reg. 25,324, 25,398 (May 7, 2010); Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles, 76 Fed. Reg. 57,106, 57,294 (Sept. 15, 2011); 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards, 77 Fed. Reg. 62,624, 62,894 (Oct. 15, 2012); Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles-Phase 2, 81 Fed. Reg. 73,478, 73,486 (Oct. 25, 2016); Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles, 89 Fed. Reg. 27,842, 27,862-64 (Apr. 18, 2024); Oil and Natural Gas Sector: Emission Standards for New, Reconstructed, and Modified Sources, 81 Fed. Reg. 35,824, 35,834 (June 3, 2016); Standards of Performance for Municipal Solid Waste Landfills, 81 Fed. Reg. 59,332, 59,338 (Aug. 29, 2016). EPA's Inspector General confirmed in 2011 that EPA's 2009 finding "met statutory requirements for rulemaking and generally followed requirements and guidance related to ensuring the quality of the supporting technical information." EPA Off. Inspector Gen., Procedural Review of EPA's Greenhouse Gases Endangerment Finding Data Quality Processes (Report No. 11-P-0702), at iii ["At a Glance"] (Sept. 26, 2011), https://perma.cc/W65J-4YZQ.

[103] *See* IPCC Impacts AR6, *supra* note 44. (Of particular note, see Chapter 14: North America at p.1929-2042 and peer-reviewed citations at 2000-2042.)

[104] *See* NCA5, *supra* note 1. Of particular note, *see* "Extreme Events are Becoming More Frequent and Severe" at 2-16, "Humans Are Changing Weather and Climate Extremes" at 3-30, "Water Cycle Changes Will Affect All Communities, with Disproportionate Impacts for Some" at 4-16, "Climate Change Threatens Energy Systems" at 5-4, "The Goods and Services Provided by Land Systems Are Threatened by Climate Change" at 6-9, "Species Changes and Biodiversity Loss Are Accelerating" at 8-16, "Coastal Hazards Are Increasing Due to Accelerating Sea Level Rise and Changing Storm Patterns" at 9-5, "Unprecedented Climate Impacts [to oceans and marine resources] Threaten Ecosystems and Human Well-Being" at 10-5, "Climate Change Will Hamper Efforts to Improve US Air Quality" at 14-5, "Increasing Wildfire Smoke Is Harming Human Health and Catalyzing New Protection Strategies" at 14-9, and "Climate Change Is Harming Human Health" at 15-6. *See also* Nat'l Intel. Council, National

Intelligence Estimate: Climate Change and International Responses Increasing Challenges to US National Security Through 2040 (No. NIC-NIE-2021-10030-A), at i (Oct. 21, 2021), https://perma.cc/L7NX-NFMJ ("We assess that climate change will increasingly exacerbate risks to US national security interests as the physical impacts increase and geopolitical tensions mount about how to respond to the challenge. . . . Intensifying physical effects will exacerbate geopolitical flashpoints, particularly after 2030, and key countries and regions will face increasing risks of instability and need for humanitarian assistance."); Lloyd L. Johnson, Sec'y of Def., *Foreword* to Dep't of Def., Off. of the Undersecretary of Def. (Acquisition & Sustainment), Department of Defense Draft Climate Adaptation Plan: Report Submitted to National Climate Task Force and Federal Chief Sustainability Officer, at 1, 3 (Sept. 1, 2021), https://perma.cc/3USB-WR44 ("We in the Department of Defense (DOD) know first-hand the national security risk posed by climate change because it affects the work we do every day. Around the world, climate change is a destabilizing force, demanding new missions of us and altering the operational environment. At the same time, climate-related extreme weather affects military readiness and drains our resources. In just the past few years, wildfires have forced evacuations at bases in the western United States, while hurricanes on the East Coast and flooding in the Midwest have inflicted billions of dollars of damage on facilities that are home to key warfighting capabilities."); *id.* at 3 ("The Department of Defense (DOD) has identified climate change as a critical national security issue and threat multiplier (DOD 2014a) and top management challenge (DOD 2020a). Climate change will continue to amplify operational demands on the force, degrade installations and infrastructure, increase health risks to our service members, and could require modifications to existing and planned equipment. Extreme weather events are already costing the Department billions of dollars and are degrading mission capabilities. These effects and costs are likely to increase as climate change accelerates. Not adapting to climate change will be even more consequential with failure measured in terms of lost military capability, weakened alliances, enfeebled international stature, degraded infrastructure, and missed opportunities for technical innovation and economic growth."); Dep't of Def., Quadrennial Defense Review 2014, at 8 (Mar. 2014), https://perma.cc/XUX4-6LDP ("Climate change poses another significant challenge for the United States and the world at large. As greenhouse gas emissions increase, sea levels are rising, average global temperatures are increasing, and severe weather patterns are accelerating. These changes, coupled with other global dynamics, including growing, urbanizing, more affluent populations, and substantial economic growth in India, China, Brazil, and other nations, will devastate homes, land, and infrastructure. Climate change may exacerbate water scarcity and lead to sharp increases in food costs. The pressures caused by climate change will influence resource competition while placing additional burdens on economies, societies, and governance institutions around the world. These effects are threat multipliers that will aggravate stressors abroad such as poverty, environmental degradation, political instability, and social tensions – conditions that can enable terrorist activity and other forms of violence."); Inspector Gen., Dep't of Def., Fiscal Year 2021: Top DOD Management Challenges, at 25 (Oct. 15, 2020), https://perma.cc/TGG7-RCML ("Changing climate and weather patterns, including extreme and damaging weather events, have adversely impacted military infrastructure and personnel readiness. Meanwhile, droughts, water scarcity, and other natural resource limitations offer opportunities for adversaries, competitors, and violent extremist organizations to exert their influence in pursuit of their goals. These challenges require the DoD to develop long-term plans to address these non-traditional threats without compromising its ability to defend the U.S. homeland and national security interests."); *id.* at 27 ("Some DoD Components have dedicated efforts to identify or mitigate the threats of climate change and extreme weather. In 2019, the Office of the Under Secretary of Defense for Acquisition and Sustainment published a report on the effects of climate change on the DoD. The report stated that out of 79 installations reviewed in the continental United States, 53 are currently vulnerable to repeat flooding. Additionally, it stated that more than half of the 79 installations are at risk from drought and nearly half are vulnerable to wildfire.") (internal citations omitted).

III. The rushed 2025 CWG Report is procedurally and substantively flawed.

The CWG Report—which disregards the massive body of evidence demonstrating climate change and its harms—is fundamentally flawed, both procedurally and substantively. These flaws are not surprising given the Report's hasty preparation, the scope and complexity of topics covered, the authors' lack of expertise in many of the relevant scientific fields, the unbalanced composition of the CWG, and the lack of peer review. As the authors explained in its preface, "[t]he short timeline and the technical nature of the material meant that we could not comprehensively review all topics." CWG Report at *x*. That admission understates the problem. Importantly, though Secretary Wright pitches the Report as a comprehensive assessment of climate science and impacts, *id.* at viii, the authors admit that they were charged with assessing "evidence and perspectives that challenge the mainstream consensus." *Id.* They did not "attempt to survey the entire literature related to the topics covered," and they instead focused only on topics that are purportedly "downplayed in, or absent from, recent assessment reports." *Id.* The Report thus by its terms cannot substitute for a comprehensive survey of climate science like the IPCC Assessment Reports or NCAs just discussed. But to the extent the Report otherwise purports to do so, or that any agency relies on it as such (as EPA has done already), it is fatally flawed both because its preparation was procedurally improper—having failed to comply with applicable law and well-accepted standards of scientific integrity—and because it is unsupported and undermined by the relevant peer-reviewed literature and scientific consensus.

A. The CWG Report is procedurally flawed.

1. DOE failed to comply with the Federal Advisory Committee Act in establishing the CWG and preparing the CWG Report.

In creating and commissioning the CWG, Secretary Wright failed to comply with the requirements of the Federal Advisory Committee Act (FACA), the regulations promulgated thereunder, and the DOE's Advisory Committee Management Program Manual. Many FACA

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[105] Allergy & Asthma Network et al., *A Declaration on Climate Change and Health* (May 20, 2025), https://perma.cc/H9EM-A8KZ ("Climate change is a health emergency that is already harming health and causing loss of life. The window to prevent the worst impacts is rapidly closing. . . . Climate change puts everyone's health at risk, regardless of where you live. . . . Extreme heat is killing people. It causes more deaths than any other weather-related hazard, and climate change is making it much worse. . . . Wildfires are becoming more frequent and intense, spreading dangerous smoke that is making people sick. Particle pollution and other harmful substances in the smoke are linked to lung disease, lung cancer, heart disease, stroke, dementia, and preterm birth. Climate change is making smog worse . . . which is linked to asthma attacks, lung disease, cardiovascular disease, preterm and low birthweight infants, cancer, harms to brain health and premature death. Storms and flooding are getting more severe, causing injuries, [and] worsening physical and mental health. . . . Disease-carrying insects like ticks and mosquitoes are multiplying and spreading to new areas, increasing exposure to illnesses like Lyme disease and Dengue fever. Water-food-borne pathogens are also spreading.").

violations also constitute violations of the Administrative Procedure Act. *Ctr. for Biological Diversity v. Tidwell*, 239 F. Supp. 3d 213, 220 (D.D.C. 2017).

Because the head of a federal executive agency created the CWG, and its work has been utilized to provide advice to at least one such agency, the CWG is a committee as defined by FACA and is subject to its requirements. *See* 5 U.S.C. § 1001(2)(A).

i. FACA imposes substantial procedural requirements governing the formation and functioning of advisory committees.

FACA was enacted in 1972 following significant increases in the number of committees, boards, commissions, councils, and similar groups created to provide advice to the federal government.[106] The Act aims to ensure that all FACA committees are necessary, their number is kept to a minimum, they are terminated when no longer necessary, and uniform standards and procedures are used for their establishment, operation, administration, and duration. 5 U.S.C. § 1008; *see also Pub. Citizen v. U.S. Dep't of Just.,* 491 U.S. 440, 446 (1989) (outlining purpose and importance of FACA).

In enacting FACA, Congress aimed to prevent the proliferation of committees "dominated by representatives of industry and other special interests seeking to advance their own agendas." *Cummock v. Gore*, 180 F.3d 282, 284 (D.C. Cir. 1999). Rather, Congress intended to require "the public accountability of advisory committees established by the Executive Branch." *Pub. Citizen*, 491 U.S. at 459. Key FACA requirements, therefore,

> promote transparency, accountability, and open public participation in executive branch decisions and prevent informal advisory committees from exerting improper or one-sided influence. Specifically, the statute seeks to "ensure that [advisory committees'] creation, operation, and duration be subject to uniform standards and procedures; that Congress and the public remain apprised of their existence, activities, and cost; and that their work be exclusively advisory in nature."

VoteVets Action Fund v. U.S. Dep't of Vets. Affs., 992 F.3d 1097, 1101 (D.C. Cir. 2021) (quoting *Pub. Citizen*, 491 U.S. at 446 (alteration in original)). In addition to FACA and its implementing regulations, 41 C.F.R. Part 102-3, DOE also utilizes an Advisory Committee Management Program Manual with which the Secretary and any committee must comply.[107] These statutory,

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[106] *See Federal Advisory Committee Act (FACA) Management Overview*, U.S. Gen. Servs. Admin. (last updated Mar. 4, 2025), https://perma.cc/3K96-ZZKN.

[107] *See* DOE Off. of Mgmt. Advisory Committee Management Program Manual (DOE M 515.1-1*)* (approved Oct. 22, 2007), https://perma.cc/4LYC-8W3E (*DOE Advisory Committee Manual*).

regulatory, and internal guidelines provide a clear and highly developed framework for the creation, operations, and oversight of advisory committees.

FACA defines "advisory committee" as any "committee, board, commission, council, conference, panel, task force, or other similar group, or any subcommittee or other subgroup thereof" created by statute, the President, or any federal agency "that is established or utilized to obtain advice or recommendations for the President or one or more agencies or officers of the Federal Government." 5 U.S.C. § 1001(2)(A); *see also* 41 C.F.R. § 102-3.25. To establish an advisory committee, an agency head must consult with the General Services Administration's Secretariat, providing an explanation stating why the advisory committee is essential to the conduct of agency business and in the public interest. 41 C.F.R. § 102-3.60(b)(1).[108] Secretary Wright, as DOE's agency head, is responsible for approving nominated members to the advisory committee.[109] He is also responsible for "compliance with FACA and other provisions ensuring that advisory committees not be unduly influenced by their appointing authority or special interests."[110]

Significantly, a "fairly balanced membership" is required. 41 C.F.R. § 102-3.60(b)(3). The advisory committee members' points of view must be diverse. *Id.* § 102-3.60(b)(3)(i).[111] In addition to formulating a group that is balanced in terms of point of view, DOE requires that "[c]onsideration will also be given to factors such as the geographic region of the country; minority groups; women's organizations; public and private academic institutions, including Black colleges and universities; physically challenged individuals and groups; and the public at large."[112] To that end, a required proposal package for the appointment of members must include a discussion of how a "fairly balanced membership" was achieved and the agency must create and submit a Membership Balance Plan (MBP). 41 C.F.R. § 102-3.60(b)(3).[113]

In addition to requiring a balanced membership, FACA also requires that "consideration [be given to] the groups and entities potentially affected or interested in [the advisory committee's] recommendations." 41 C.F.R. § 102-3.60(b)(3)(i); *see also* Federal Advisory Committee Management, 66 Fed. Reg. 37,728, 37,740 (July 19, 2001) (GSA guidance that "[t]he composition of an advisory committee's membership will depend on several factors including . . . [t]he relevance of State, local, or tribal governments to the development of the advisory committee's recommendations"). Such consideration is not merely contemplative or discursive,

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[108] *See also DOE Advisory Committee Manual*, *supra* note 107, § I(5)(b), at I-2.

[109] *See DOE Advisory Committee Manual*, *supra* note 107, § I(6)(a)(1), at I-2.

[110] *See id.* § I(6)(a)(2)(a), at I-3.

[111] *See also DOE Advisory Committee Manual*, *supra* note 107, § I(6)(c)(7), at I-3.

[112] *See DOE Advisory Committee Manual*, *supra* note 107, § IV(3)(a)(2), at IV-2.

[113] *See also DOE Advisory Committee Manual*, *supra* note 107, § IV(5)(a)(1)(b), at IV-4.

but rather requires "broad outreach, using a variety of means and methods, to ensure that the call for nominees reaches the interested parties and stakeholder groups likely to possess those points of view[,]" including "underserved communities." 41 C.F.R. § 102-3.60(b)(ii).

When, as here, advisory committee members serve as purported experts, they also must be appointed as "special government employees" and are subject to ethics and conflict of interest rules.[114] For example, advisory committee members are prohibited from participating in any committee matter that might have a direct and predictable impact on the companies, organizations, or agencies with which they are associated or in which they have a financial interest.[115] To identify potential conflicts, prior to becoming a committee member, each must file a public financial disclosure report that includes disclosure of "any financial or other interest that may be affected by the work of the committee or create the appearance of a conflict of interest."[116]

Before a federal advisory committee can meet, several more steps are required. Transparency and clarity are the primary objectives.[117] The agency must publish a "Notice of Intent to Establish" the advisory committee in the Federal Register. 41 C.F.R. § 102-3.65.[118] A "designated officer or employee of the Federal Government [must be chosen] to chair or attend each meeting." *NAACP Legal Def. & Educ. Fund, Inc. v. Barr*, 496 F. Supp. 3d 116, 123 (D.D.C. 2020) (internal punctuation omitted); *see also* 5 U.S.C. § 1009(e); 41 C.F.R. § 102-3.120(a). Additionally, a formal charter must be prepared and filed specifying the advisory committee's mission or charge, specific duties, and general operational characteristics. 5 U.S.C. § 1008(c)(1); 41 C.F.R. §§ 102-3.70, 102-3.75.[119]

Attendant to each of these requirements is the additional, overarching requirement that these records, and all committee-related records, must be maintained in a central location and available to the public. *See Food Chem. News v. Dep't of Health and Human Servs.*, 980 F.2d 1468, 1472 (D.C. Cir. 1992); 5 U.S.C. § 1009(b).[120] The public right to access of committee-related records is broader than that of FOIA, in that (1) no FOIA request is required, *Food Chem. News*, 980 F.2d at 1472, (2) the documents are to be publicly accessible as soon as they are

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[114] *See DOE Advisory Committee Manual*, *supra* note 107, § I(8)(n) at I-11 & I-12, and § I(6)(g)(1)(d) at I-5.

[115] *See id.* § IV(6)(b), at IV-7; *see also* 18 U.S.C. § 208(a).

[116] *See DOE Advisory Committee Manual*, *supra* note 107, § IV(6)(a)(1), at IV-7.

[117] *See Federal Advisory Committee Charters*, U.S. Gen. Servs. Admin. (last updated Oct. 16, 2024), https://perma.cc/KF8Q-7LY8 (*FAC Charters*).

[118] *See* also *DOE Advisory Committee Manual*, *supra* note 107, § II(4)(c)(1), at II-4.

[119] *See also FAC Charters*, *supra* note 117.

[120] *See also DOE Advisory Committee Manual*, *supra* note 107, § I(6)(i)(14), at I-9.

prepared or used, *id.*, and (3) FOIA's deliberative process exemption is not available to advisory committees, *Heartwood, Inc. v. U.S. Forest Serv.*, 431 F. Supp. 2d 28, 36 (D.D.C.).

In addition to the requirement that all documents be publicly accessible, so too must "each advisory committee meeting [ ] be open to the public."[121] 5 U.S.C. § 1009(a)(1); *see also* 41 C.F.R. § 102-3.140(a). "Committee meeting" is defined as:

> any gathering of advisory committee members (whether in person or electronically, such as using telecommunications or through a virtual platform), held with the approval of an agency, and with a Designated Federal Officer in attendance, for the purpose of deliberating on the matters upon which the advisory committee provides advice or recommendations.

41 C.F.R. § 102-3.25.

Public notice of each meeting is to be published in the Federal Register at least 15 days prior to a meeting and 30 days whenever possible. *Id.* § 102-3.150(a).[122] Each meeting must be "held at a reasonable time and in a manner or place accessible to the public[,] include [] consideration of affected communities," and be "accessible to . . . persons with disabilities." 41 C.F.R. § 102-3.140(a)(1). The regulations provide for high levels of participation, allowing for the submission of written statements and for "[a]ny member of the public [to] speak to or otherwise address the advisory committee if the agency's guidelines so permit." *Id.* § 102-3.140(a)(4). Indeed, the departmental guidelines governing public participation are even more inclusive, requiring that a minimum of 15 minutes be allotted at the conclusion of each open meeting for oral statements, if not taken throughout the meeting.[123]

In keeping with the expansive transparency requirements related to committee documents, "[d]etailed minutes of each meeting of each advisory committee shall be kept and shall contain a record of the persons present, a complete and accurate description of matters discussed and conclusions reached, and copies of all reports received, issued, or approved by the advisory committee." 5 U.S.C. § 1009(c).[124] Minutes must be posted on the advisory committee website within 14 days of being certified for accuracy. 41 C.F.R. § 102-3.165(c).

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[121] The limited exceptions to the open meeting requirement are inapplicable here. 5 U.S.C. § 552b(c). *See also DOE Advisory Committee Manual*, *supra* note 107, § V(4), at V-4.

[122] *See also DOE Advisory Committee Manual*, *supra* note 107, § V(3)(c)(1), at V-3.

[123] *See DOE Advisory Committee Manual*, *supra* note 107, § V(3)(a)(2)(b)(1), at V-2.

[124] *See also* 41 C.F.R. § 102-3.165(b); *DOE Advisory Committee Manual*, *supra* note 107, § V(5), at V-5.

ii. DOE failed to comply with FACA's mandates.

It is difficult to overstate how far Secretary Wright has strayed from the letter and spirit of the law in commissioning and overseeing the CWG. Whereas FACA, the regulations promulgated thereunder, and the Department's Advisory Committee Management Program Manual require transparency and public accessibility and participation, Secretary Wright and his CWG have operated in secrecy.

The CWG is an advisory committee as defined by FACA and is therefore subject to FACA's requirements. It is a "committee, board, commission, council, conference, panel, task force, or other similar group," 5 U.S.C. § 1001(2)(A), having a fixed membership of five individuals, that was "established or utilized to obtain advice or recommendations for . . . one or more agencies or officers of the Federal Government," *id*. Observing that "misguided policies based on fear rather than facts could truly endanger human well-being," Secretary Wright's Foreword notes that he established the CWG, "commissioned" the CWG Report, and "selected the authors" "to encourage a more thoughtful and science-based conversation about climate change and energy." CWG Report at viii; *see* 41 C.F.R. § 102-3.50. The Report's preface clearly explains the CWG's advisory purpose: "Secretary Wright assembled an independent group to write a report on issues in climate science relevant for energy policymaking." CWG Report at x. Indeed, the CWG Report has already been utilized to provide advice and recommendations to at least one federal agency, as it is cited as a primary basis for an EPA proposed rule, the Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards, 90 Fed. Reg. at 36,292 n.10.

Despite the CWG fitting squarely within the definition of an advisory committee, Secretary Wright failed to follow the requirements of FACA, its implementing regulations, or DOE's own FACA manual. To begin, Secretary Wright seemingly did not consult the General Services Administration's Secretariat in forming the CWG or provide a Membership Balance Plan to the General Services Administration, and no such plan was created or published. *See* 41 C.F.R. §§ 102-3.60. And it is unclear whether the committee members were made special government employees[125] and whether they submitted the requisite financial disclosure reports.[126]

The CWG's membership also is not fairly balanced in terms of points of view, *id*. § 102-3.60(b)(3)(i): though 97% of climate scientists concur in the overwhelming scientific consensus that humans, via greenhouse gas emissions, are causing climate change and that the effects of

[125] *See DOE Advisory Committee Manual*, *supra* note 107, § I(8)(n), at I-11 and I-12, and § I(6)(g)(1)(d), at I-5.

[126] *See DOE Advisory Committee Manual*, *supra* note 107, § IV(6)(a)(1), at IV-7.

climate change are harmful to public health and welfare,[127] the members of the CWG are all members of the 3% who disagree, CWG Report at 140-41. The CWG also lacks balance in terms of geography, gender, and racial diversity, as is required by DOE's own policy.[128] Four of the five CWG members are male, all are white, and three reside and/or work in the southeastern United States. DOE also did not conduct outreach to or consult with communities and stakeholders that are and will be affected by or interested in the CWG's conclusions. 41 C.F.R. § 102-3.60(b)(3)(ii). There are also no provisions in place to prevent inappropriate influence on the CWG's work, *id*. § 102-3.105(i), and in fact Secretary Wright inappropriately influenced the CWG by directing it to prepare a report with a predetermined goal and outcome. *See infra* Section III.A.2. As discussed below, Secretary Wright also influenced the CWG by providing a Foreword summarizing the Report's conclusions before he had even read a draft of the Report. *See id.*

Secretary Wright also failed to publish a notice of intent to establish the CWG, *id.* § 102-3.65, failed to designate an officer to chair its meetings, *id*. § 102-3.120(a), and did not prepare and file a proposed charter in violation of FACA. *See id*. § 102-3.70. DOE did not publish notice of committee meetings in the Federal Register or otherwise notify the public of meetings, *id*. § 102-3.150, did not make meetings open to the public, *id*. 102-3.140(a), and did not give members of the public the opportunity to address the advisory committee, *id.* § 102-3.140(a)(4). And despite FACA's intent and its emphasis on transparency and accountability, DOE failed to make public the records and other documents that the CWG must make public under Section 10(b) of FACA, 5 U.S.C. § 1009(b), and likewise has not kept or made public minutes of the CWG's meetings, 41 C.F.R. § 102-3.165. Indeed, the CWG operated in entire secrecy and its existence was hidden from the public from its inception in early April 2025 until the Report's release on July 29, 2025.

Congress enacted FACA to prevent exactly what Secretary Wright has done. Indeed, these blatant violations have already resulted in litigation. *See Env't Def. Fund v. Wright*, No. 1:25-cv-12249 (D. Mass., filed Aug. 12, 2025). DOE must withdraw the CWG Report and disband the CWG unless and until it fully complies with the FACA's requirements. *See, e.g., NAACP Legal Def. & Educ. Fund, Inc.*, 496 F. Supp. 3d at 145 ("order[ing] that Commission proceedings be halted and that defendants may not submit, publish, or rely on any report or recommendations produced by the Commission until the requirements of FACA are satisfied"). At the very least, this would mean starting over.

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[127] *Do scientists agree on climate change?*, NASA (last updated Mar. 18, 2024), https://perma.cc/G73G-LD3H.

[128] *See DOE Advisory Committee Manual*, *supra* note 107, § IV(3)(a)(2), at IV-2.

2. Secretary Wright prejudged the outcome of the CWG Report.

Secretary Wright has demonstrated an "unalterably closed mind on matters critical to the disposition of" the CWG Report and inappropriately influenced its content and findings. This provides a separate reason why DOE must withdraw the CWG Report, disband the CWG, and begin a new process that is untainted by the Secretary's prejudgment. *See Ass'n of Nat'l Advertisers, Inc. v. FTC.*, 627 F.2d 1151, 1170 (D.C. Cir. 1979); *Nehemiah Corp. of Am. v. Jackson*, 546 F. Supp. 2d 830, 847 (E.D. Cal. 2008).

"There is no doubt that the purpose of [the public comment period] would be frustrated if [agency officials] had reached an irrevocable decision . . . prior to . . . final action." *Ass'n of Nat'l Advertisers*, 627 F.2d at 1170. Several circumstances may indicate that an agency official is unable to meaningfully consider the public's comments, including: (1) a preexisting internal directive to reach a particular result, *id.* at 1172; and (2) a senior political official's patterns of behavior or statements, including an unequivocal announcement of a "dramatic change" in the agency's position, prior to the conclusion of an administrative proceeding, *Int'l Snowmobile Mfrs. Ass'n v. Norton*, 340 F. Supp. 2d 1249, 1260–61 (D. Wyo. 2004). In such cases, "[a]llowing the public to submit comments to an agency that has already made its decision is no different from prohibiting comments altogether." *Nehemiah Corp. of Am.*, 546 F. Supp. 2d at 847.

Secretary Wright's conduct, both before and after he opened a public comment period on the CWG Report, exemplifies both disqualifying circumstances, showing that he is "unable to consider meaningfully" the evidence presented during the public comment period. *Ass'n of Nat'l Advertisers*, 627 F.2d at 1170.

First, a preexisting internal directive to reach a particular result is strong evidence that that official is not "free, both in theory and in reality, to change his mind" following public comment. *Id.* at 1172; *see also Int'l Snowmobile Mfrs. Ass'n*, 340 F. Supp. 2d at 1260. The President's Executive Orders, including Executive Order No. 14,154, *Unleashing American Energy*, 90 Fed. Reg. 8353 (Jan. 29, 2025) (*Unleashing* EO), show that the President has directed DOE to pre-determine certain key factual or legal matters prior to opening any proposal for public comment. These Executive Orders direct and commit executive agencies to an agenda of

facilitating greater use of fossil fuels,[129] while constraining the use of renewable energy,[130] with the intent of reshaping the country's energy sector in favor of the resources the Administration prefers.[131] In particular, the *Unleashing* EO requires DOE to "identify those agency actions that impose an undue burden on the identification, development, or use of domestic energy resources—with particular attention to oil, natural gas, [and] coal . . . resources." 90 Fed. Reg. at 8354. The *Unleashing* EO also required Secretary Wright to, within 30 days, "develop and begin implementing action plans to suspend, revise, or rescind all agency actions identified as unduly burdensome." *Id.* And the *Unleashing* EO also directed that "the Administrator of the EPA, in collaboration with the heads of any other relevant agencies, shall submit joint recommendations to the Director of OMB on the legality and continuing applicability of the Administrator's findings, 'Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act,' Final Rule, 74 FR 66496 (December 15, 2009)," i.e., the 2009

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[129] *See, e.g.,* Exec. Order No. 14,261, of Apr. 8, 2025, *Reinvigorating American's Beautiful Clean Coal Industry and Amending Executive Order 14,241*, 90 Fed. Reg. 15,517 (Apr. 14, 2025) (declaring that "[i]t is a national priority to support the domestic coal industry by . . . *encouraging the utilization of coal to meet growing domestic energy demands*" and directing DOE to revise its regulations to encourage the utilization of coal); Exec. Order No. 14,262, of Apr. 8, 2025, *Strengthening the Reliability and Security of the United States Electric Grid*, 90 Fed. Reg. 15,521–22 (Apr. 14, 2025) (directing the Secretary of Energy to prevent "critical" generation resources from retiring or converting to a different fuel type, in the context of ongoing coal plant retirements and conversions); Exec. Order No. 14,213, of Feb. 14, 2025, *Establishing the National Energy Dominance Council*, 90 Fed. Reg. 9945 (Feb. 14, 2025) (equating use of fossil fuels with making America energy dominant); Exec. Order No. 14,156, of Jan. 20, 2025, *Declaring a National Energy Emergency*, 90 Fed. Reg. 8433 (Jan. 29, 2025) (directing agencies to facilitate fossil fuel production), Exec. Order No. 14,303, of May 23, 2025, *Restoring Gold Standard Science*, 90 Fed. Reg. 22601 (May 29, 2025); Exec. Order No. 14,270, of Apr. 9, 2025, *Zero-Based Regulatory Budgeting To Unleash American Energy*, 90 Fed Reg. 15,643 (Apr. 15, 2025); Exec. Order No. 14,260, of Apr. 8, 2025, *Protecting American Energy From State Overreach*, 90 Fed. Reg. 15,513 (Apr. 14, 2025); Exec. Order No. 14,236, of Mar. 14, 2025, *Additional Rescissions of Harmful Executive Orders and Actions*, 90 Fed. Reg. 13,037 (Mar. 20, 2025); Exec. Order No. 14,225, of Mar. 1, 2025, *Immediate Expansion of American Timber Production*, 90 Fed. Reg 11,365 (Mar. 6, 2025); Exec. Order No. 14,162, of Jan. 20, 2025, *Putting America First in International Environmental Agreements*, 90 Fed. Reg. 8455 (Jan. 30, 2025).

[130] *See* Exec. Order No. 14,315, of July 7, 2025, *Ending Market Distorting Subsidies for Unreliable, Foreign-Controlled Energy Sources*, 90 Fed. Reg. 30,821 (July 10, 2025) (directing Treasury Department to strictly enforce termination of renewable energy tax credits and restrict their use); Presidential Memorandum of January 20, 2025, *Temporary Withdrawal of All Areas on the Outer Continental Shelf from Offshore Wind Leasing and Review of the Federal Government's Leasing and Permitting Practices for Wind Projects,* 90 Fed. Reg. 8363 (Jan. 29, 2025) (precluding wind leasing on the Outer Continental Shelf, pausing all wind approvals, leases, loans, and rights of way, and putting a moratorium on the Lava Ridge Wind Project).

[131] In signing the first tranche of Executive Orders, President Trump said "We're bringing back an industry that was abandoned. . . . All those plants that have been closed are going to be opened." Adam Burke, *Trump Orders Coal Revival, But Market Favors Natural Gas*, Nat'l Pub. Radio (NPR) (Apr. 17, 2025, 12:01 AM ET), https://perma.cc/G73G-LD3H.

Endangerment Finding that EPA now proposes to rescind in reliance on the CWG Report. *Id.* at 8357.

> True to the President's plan, in announcing its release of the CWG Report, DOE stated:
>
> > The report was published today as part of the U.S. Environmental Protection Agency's (EPA) proposed rule repealing the 2009 Endangerment Finding. EPA's proposed rule, if finalized, will mark a critical step forward in achieving President Trump's commitment to unleash American energy dominance.[132]

Secretary Wright's identification of the Report as a critical step toward fulfilling the mandate of the directives in President Trump's Executive Orders, and his coordinated release of the Report on the same day as EPA's proposed Endangerment Finding rescission, demonstrate that he and DOE are not free—either in theory or in reality—to change their mind after public comment. Rather, Secretary Wright has demonstrated an unshakable, predetermined commitment to facilitate use of the CWG Report to undermine the established climate science underpinning climate regulations as a tool to achieve the President's directive to advantage fossil fuels in the name of energy dominance and promote skepticism about the existence and impacts of climate change. Although general political or ideological stances are not enough to show prejudgment, President Trump's Executive Orders on fossil fuels are specific and binding. *See Ass'n of Nat'l Advertisers*, 627 F.2d at 1170. President Trump's agenda does not reflect merely an interest in allowing increased greenhouse gas emissions, but, according to the Secretary, a specific promise to "dismantl[e]" regulations controlling greenhouse gas emissions.[133]

Second, an agency official's actions and statements, both before and after purporting to seek public comment, may indicate that they have prejudged the outcome of the proceeding. To determine whether an official has demonstrated an "unalterably closed mind on matters critical to the disposition of the proceeding," their statements are to be examined as a whole using a clear and convincing evidence standard. *Hous. Study Grp. v. Kemp*, 736 F. Supp. 321, 332 (D.D.C. 1990); *see also Ass'n of Nat'l Advertisers*, 627 F.2d at 1170–71. While "an expression of opinion prior to the issuance of a proposed rulemaking does not, without more, show that an agency member cannot maintain an open mind during the hearing stage of the proceeding," patterns of behavior or statements may indicate an inability or unwillingness to meaningfully consider the public's comments. *Hous. Study Grp*., 736 F. Supp. at 333 (*quoting* A*ss'n of Nat'l Advertisers*, 627 F.2d at 1173). In this inquiry, courts have noted a distinction between statements made prior to a proposed rulemaking and statements made after a proceeding has commenced, viewing the

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[132] *Department of Energy Issues Report Evaluating Impact of Greenhouse Gasses on U.S. Climate, Invites Public Comment*, DOE (July 29, 2025), https://perma.cc/MU67-7JJ6.

[133] *See Statement from Energy Secretary Chris Wright on President Trump's Joint Address to Congress*, DOE (Mar. 4, 2025), https://perma.cc/4DB8-H33D.

latter with increased skepticism. *See id.; Penobscot Indian Nation v. U.S. Dep't of Hous. & Urb. Dev.*, 539 F. Supp. 2d 40, 46 n.5 (D.D.C.). While a showing of prejudgment requires more than "mere discussion of policy or advocacy on a legal question," *Ass'n of Nat'l Advertisers*, 627 F.2d at 1171, a statement that constitutes or announces a dramatic change in agency policy can constitute a prejudgment, *Int'l Snowmobile Mfrs. Ass'n*, 340 F. Supp. 2d at 1260–61.

Secretary Wright has repeatedly demonstrated, through his actions and statements both before and after release of the Report, that he has prejudged, and almost certainly influenced the CWG's findings on, the specific scientific and policy issues in the CWG Report on which DOE purportedly seeks public comment. First, even before release of the Report, Secretary Wright frequently expressed his disagreement with the overwhelming scientific consensus on the harmful consequences of climate change, consistent with the arguments set forth in the Report. For example, he has frequently asserted that extreme weather events are not increasing over time.[134] This matches the CWG Report's statement that "[m]ost types of extreme weather exhibit no statistically significant long-term trends over the available historical record." CWG Report at 46. He has stated that "a warmer planet, with more CO_2, is better for growing plants."[135] This mirrors the CWG Report's assessment that "[t]he growing CO_2 concentration in the atmosphere has the important positive effect of promoting plant growth." CWG Report at 3. Both Secretary Wright and the CWG Report critique climate policies and mainstream science for their purported reliance on the RCP 8.5 scenario, explained *infra* Section III.B.1.iii. CWG Report at 11.[136] Both Secretary Wright and the CWG Report state that social-cost-of-carbon calculations are unfounded and that emissions reductions policies will do more harm than good. *See* CWG

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[134] *Energy Secretary Wright Testifies on 2026 Budget Request*, C-SPAN, at 51:10 (June 18, 2025), https://www.c-span.org/program/senate-committee/energy-secretary-wright-testifies-on-2026-budget-request/661387 ("Extreme weather is not actually exploding and growing as everyone says.") (Sec. Wright Testimony June 18, 2025); *see also Beyond Scope: How the SEC's Climate Rule Threatens American Markets: Hearing Before the H. Comm. On Fin. Servs.,* 118th Cong. 11 (Apr. 10, 2024) (statement of Chris Wright, Founder, Chairman & CEO, Liberty Energy Inc.), https://perma.cc/XZY2-BCV4 (Wright Statement on SEC Rule) ("[T]to date we have not seen an increase in extreme weather events."); *see also* Chris Wright, CEO, Liberty Energy, *Introduction*, Bettering Human Lives Report 16 (Liberty Energy, Jan. 2024), https://perma.cc/4WFL-WW97 ("[W]e often hear [that] climate change . . . leads to a significant increase in extreme weather events with deadly consequences. This claim is false."); *see also* Chris Wright, CEO Liberty Energy, LinkedIn (2024), https://perma.cc/2V2R-7M4R, (IPCC "reports no significant trends in extreme weather events like hurricanes, tornadoes, floods or droughts") (citation omitted).

[135] *Secretary Wright Joins FOX Business's Stuart Varney*, at 0:20, YouTube: U.S. Dep't of Energy Channel (Feb. 19, 2025), https://www.youtube.com/watch?v=GsijyIafpPA [hereinafter Wright Fox Business Interview],.

[136] *See also* Clare Zhang, *DOE Secretary Defends Cuts to National Labs while Suggesting Future Boost*, Am. Inst. Physics (June 20, 2025), https://perma.cc/QY6Z-NMV8.

Report at x, 120–121, 125.[137] To support these contrarian assessments, Secretary Wright has even relied on some of the same studies cited in the CWG Report.[138]

Furthermore, Secretary Wright's empanelment of the five individuals he hand-picked to comprise the CWG is additional evidence of his prejudgment. The five members of the CWG all hold opinions contrary to the vast majority of climate scientists.[139] Secretary Wright was familiar

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[137] Zhang, *DOE Secretary Defends Cuts to National Labs while Suggesting Future Boost*, *supra* note 136 ("Wright criticized the Biden administration's calculations of the social cost of carbon as 'crazy' and 'torturous math[.]' . . . '[S]hould we spend $300 to reduce a cost that maybe is $100? . . . Clearly, that math just doesn't add up.'") (quoting Sec. Wright Testimony, June 18, 2025, *supra* note 134).

[138] *See* Wright Statement on SEC Rule, *supra* note 134, at 10-11 & nn. 52, 53, 56 (citing Gasparrini et al. (2015), *infra* note 249; Qi Zhao, et al., *Global, Regional, and National Burden of Mortality Associated with Non-Optimal Ambient Temperatures from 2000 to 2019: A Three-State Modelling Study*, 5 (7) Lancet Planetary Health E415-E425 (July 2021); and Philip J. Klotzbach et al., *Continental U.S. Hurricane Landfall Frequency and Associated Damage: Observations and Future Risks*, 99 (7) Bull. Am. Meteorological Soc'y 1359-1376 (July 1, 2018), https://journals.ametsoc.org/view/journals/bams/99/7/bams-d-17-0184.1.xml); CWG Report at 50–51, 112 (same).

[139] John Christy has a reputation for being "a favorite of the political right, in large part, because of his views that carbon dioxide emissions have very little influence on the climate." Richard Banks, *Alabama's John Christy May Be the Country's Best Known and Most Criticized Climate Change Skeptic*, WBHM.org (Sept. 1, 2023), https://perma.cc/U95D-J2QJ. He has made "frequent appearances on Capitol Hill [that] have almost always been at the request of Republican legislators opposed to addressing climate change," Michael Wines, *Though Scorned by Colleagues, a Climate-Change Skeptic Is Unbowed*, N.Y. Times (July 15, 2014), https://www.nytimes.com/2014/07/16/us/skeptic-of-climate-change-john-christy-finds-himself-a-target-of-suspicion.html. (attached as Exhibit R), and he is also "a frequent speaker at conservative think tanks that promote the notion that worldwide temperature increases are largely unrelated to human activity," Scott Waldman & E&E News, *Scientist Who Rejects Warming Is Named to EPA Advisory Board*, Sci. Am. (Feb. 1, 2019), https://perma.cc/2NE7-69QQ**.** Christy "is a critic of efforts to mandate reduction of carbon emissions," William Thornton, *Trump Administration Hires 2 Alabama Climate Change Skeptics for Energy Department*, Ala. Media Grp. (July 9, 2025, 12:43 PM; updated July 9, 2025, 1:23 PM), https://perma.cc/77B5-PSX7, and he has long "advocated for the repeal of regulations on greenhouse gas emissions." Waldman & E&E News (2019), *supra* this note.

Judith Curry is known for having "testified in front of Congress, boosted by politicians who use her work to argue that environmental regulations and a scaling down of fossil fuel use will be ineffective. Her work is frequently invoked by climate skeptics and denialists." Scott Waldman, *Judith Curry Retires, Citing "Craziness" of Climate Science*, E&E News (Jan. 4, 2017, 8:30 AM EST), https://perma.cc/8X3Y-JNZ2. She maintains a climate-skepticism blog, Climate Etc., Judith Curry, *About*, Climate Etc. Blog (last visited Aug. 27, 2025), https://judithcurry.com/about/. In one blog post, she predicts that climate scientists will hate the CWG Report "because Trump Derangement Syndrome." *See* Judith Curry, *New Climate Assessment Report from US DOE*, Climate Etc. Blog (July 29 2025), https://perma.cc/T33Q-YQQQ, and has published a book in which she opines that "the threat from human-caused climate change is not dire" and advises "*not* [to] suppress fossil-fuel use because that would impose serious costs while generating no detectable benefits." Rupert Darwall, *Book Review: Climate Uncertainty and Risk, by Judith Curry*, Real Clear Energy (Oct. 8, 2023), https://perma.cc/P2HY-L2PZ (describing the book as one "counter to the

IPCC that offers a radical alternative to the UN paradigm of climate change that could well serve as a manual for a future Republican administration"); Judith Curry, *A Critique of the Apocalyptic Climate Narrative*, Judith Curry, Climate Etc. Blog (May 7, 2025), https://perma.cc/2M77-PBBC https://judithcurry.com/2025/05/07/a-critique-of-the-apocalyptic-climate-narrative/ (emphasis in original); Maxine Joselow, *Trump Hires Scientists Who Doubt the Consensus on Climate Change*, N.Y. Times (July 8, 2025), https://www.nytimes.com/2025/07/08/climate/trump-climate-energy-department.html (attached as Exhibit S).

Steven Koonin describes himself as a friend of Secretary Wright. Maxine Joselow, *Trump Hires Scientists Who Doubt the Consensus on Climate Change*, Maxine Joselow, New. York. Times (July 8, 2025), https://www.nytimes.com/2025/07/08/climate/trump-climate-energy-department.html. Koonin has publicly stated that Secretary Wright is "well aligned with what I wrote in the book," *Unsettled: What Climate Science Tells Us, What It Doesn't and Why It Matters*, *id.*, in which Koonin advocates against reductions in fossil fuel use. Marianne Lavelle & Bob Berwyn, *A New Book Feeds Climate Doubters, but Scientists Say the Conclusions Are Misleading and Out of Date*, Inside Climate News (May 4, 2021), https://perma.cc/FZP7-AWHL. He has long advocated against renewable energy, Caitlin McFall & Andrew Murray, *Obama DOE Scientist Dissents from Biden Climate Change "Existential Crisis" Narrative*, Fox News (Apr. 22, 2021, 9:04 PM EDT), https://perma.cc/AX6P-EAH3, and has publicly acknowledged having a reputation for being a climate denier and a "shill for the oil business."[139] *Joe Rogan Experience: Episode 1776: Steven E. Koonin* YouTube: Joe Rogan Experience Channel (June 27, 2024), https://www.youtube.com/watch?v=OBjX0O7gOmw. Koonin is well-known for having suggested a debate on the issue of climate change—termed a "red team-blue team exercise"—which has been called "a mockery of scientific research, which already relies on an extensive process of peer review to weed out flawed analyses." Brad Plummer & Coral Davenport, *E.P.A. to Give Dissenters a Voice on Climate, No Matter the Consensus,* N.Y. Times (June 30, 2017), https://www.nytimes.com/2017/06/30/climate/scott-pruitt-climate-change-red-team.html (attached as Exhibit T); Steven Koonin, *A "Red Team" Exercise Would Strengthen Climate Science*, Wall St. J. (Apr. 20, 2017, 6:49 PM ET), https://www.wsj.com/articles/a-red-team-exercise-would-strengthen-climate-science-1492728579 (attached as Exhibit U).

Ross McKitrick, despite being an economist and not a scientist (climate or otherwise), co-authored a book, *Taken by Storm: The Troubled Science, Policy, and Politics of Global Warming*, that purports to "deconstruct[] the myth of global warming." *Taken by Storm: The Troubled Science, Policy, and Politics of Global Warming, Paperbook — January 1, 2008, by Christopher Essex, Ross McKitrick,* Amazon.com, https://www.amazon.com/Taken-Storm-Troubled-Science-Politics/dp/1552639460 (last visited Aug. 28, 2025). Upon President Trump's 2024 re-election, McKitrick published an article advocating for "a rethink of climate and energy policies." Ross McKitrick, *Opinion: Trump 2.0 Requires a Rethink of Climate and Energy Policies*, Fin. Post (Nov. 14, 2024), https://financialpost.com/opinion/trump-2-rethink-climate-energy-policies (attached as Exhibit V). He has long advocated against renewable energy. *See, e.g*, Hannes Sarv, *Professor McKitrick: Climate Story Is a Good Way of Expanding Government Power*, Freedom Rsch. (June 19, 2024) https://www.freedom-research.org/p/professor-mckitrick-climate-story.

Roy Spencer is a prolific blogger and often disputes warming trends and human causes of climate change. Roy Spencer, *Home/Blog Page*, Roy Spencer, Ph.D. Blog, https://perma.cc/W6EC-DDK3 (archived Aug. 27, 2025). He has written numerous books on the topic of the CWG Report, including such titles as *Climate Confusion: How Global Warming Hysteria Leads to Bad Science, Pandering Politicians and Misguided Policies That Hurt the Poor*. *Roy W. Spencer, All Books*, Amazon.com (last visited Aug. 28, 2025), https://www.amazon.com/stores/author/B001JPAG4K/allbooks?ingress=0&visitId=e10894b0-3e8b-410c-840f-6fc643509d64&ccs_id=c4f8293f-6f99-46b2-87af-5679606abf5d.

with their stances regarding the Report's topics,[140] and those stances are well known in the scientific community. Indeed, he admits he had worked with them before. CWG Report at viii. While the CWG stated in the Report's preface that Secretary Wright exercised "no editorial oversight" over the Report, it defies credulity to suggest that he did not expect and intend the conclusions his hand-picked group reached in the Report at the time he appointed them.

In addition to appointing the five members of the CWG, Secretary Wright also appointed Travis Fisher to organize the CWG and the Report; in appointing Fisher, as in appointing the CWG, Secretary Wright showed his prejudgment. Fisher's understanding of his assigned task similarly reveals Secretary Wright's prejudgment. Fisher is a vocal proponent of energy sector deregulation.[141] In explaining "Why I Helped Organize the Department of Energy's Climate Report," Fisher describes both Secretary Wright's "simple" plan to "cut against the prevailing narrative that climate change is an existential threat."[142]

Secretary Wright's prejudgment further tainted the CWG Report through his exercise of improper influence before the CWG had finished drafting it. While the CWG was working on the Report, Secretary Wright provided them with his Foreword, which characterizes the Report's content and purpose, see CWG Report viii.[143] Though Secretary Wright had not yet reviewed the Report, the Foreword summarizes its conclusions. CWG Report viii. It is simply implausible to believe that the Secretary's description of the Report did not influence its content or findings.

Secretary Wright's recent statements, both within the CWG Report and since release of the Report, similarly reveal prejudgment. In his foreword, CWG Report at viii, he makes the case for a policy shift, rather than neutrally introducing scientific findings. In support of his policy

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[140] *See All Things with Kim Strassel: Energy Secretary Chris Wright on Resetting the Climate Debate*, Wall St. J. Podcasts, at 3:16 (Aug. 5, 2025), https://www.wsj.com/podcasts/all-things-with-kim-strassel/energy-secretary-chris-wright-on-resetting-the-climate-debate/cd19e28b-1a93-4958-ab91-7b07bcd0cf73?msockid=07726cb70d546c9c0d617af20c896dc0 (All Things with Kim Strassel) ("I've been engaged in the climate discussion and debate for probably a little more than 20 years . . . so I have followed this stuff to a fault, a lot, and, you know, I had a list . . . of 12 scientists . . . I just started at the top and called them . . . 'You've been attacked for speaking out. Will you work with us?' . . . All of them said yes . . . I made five calls.").

[141] Paul Best, Cato Inst., *Travis Fisher on Why a Dynamic Electric Grid Is "Essential to Human Flourishing,"* Free Society (Spring 2025), https://www.cato.org/sites/cato.org/files/2025-03/Travis%20fisher.pdf.

[142] Travis Fisher, *Why I Helped Organize the Department of Energy's Climate Report*, Cato Inst.: Cato at Liberty Blog (Aug. 6, 2025, 10:25 AM), https://www.cato.org/blog/why-i-helped-organize-department-energys-climate-report.

[143] *See Climate Realism Show: Episode 167: The End of Official Climate Alarmism (Guest: Dr. Judith Curry)*, at 30:24, YouTube: Heartland Inst. Channel (Aug. 1, 2025, 1:00 PM ET), https://www.youtube.com/watch?v=TNdfQk8Mgmc (Curry explaining that the CWG understood "what is the Secretary thinking along these lines" because they received his Foreword in mid-May).

pitch, he opines that "[c]limate change . . . is not the greatest threat facing humanity" and makes demonstrably false claims, including that the Report is based on "the best available data and scientific assessments." *See infra/supra* Sections II, III.B.

Since release of the Report for public comment, Secretary Wright appeared on a podcast to tout "the findings [of the CWG Report], including the upsides of warming, the minimal economic effects of climate change, the limits of U.S. policy actions and the lack of evidence that climate is related to the frequency or intensity of extreme weather."[144] He has also taken to social media, claiming, "[t]he ceaseless repeating from the media, politicians and activists claiming that climate change is making weather more dangerous and severe is just nonsense. That is just NOT true."[145] These arguments are not new and have been widely debunked for decades in thousands of peer-reviewed scientific publications. If Secretary Wright has to date been unwilling to accept the scientific evidence amassed over decades and supported by 97% of climate scientists, he certainly is not open to changing his mind after a 32-day public comment period.

Secretary Wright's repeated, adamant statements regarding his prejudged stance more than overcome any contemporary, pro forma statements he has made disclaiming any prejudgment. Much like so-called "savings clauses" directing agencies to proceed "consistent with applicable law," these statements "are read in their context" and cannot overcome "clear and specific language" that shows exactly the prejudgment these statements disclaim. *See City & Cnty. of S. F. v. Trump*, 897 F.3d 1225, 1233, 1239 (9th Cir. 2018); *HIAS, Inc. v. Trump*, 985 F.3d 309, 325 (4th Cir. 2021).

Prejudgment is also indicated where, among other statements and actions, a senior political official announces a drastic change in agency policy before a proceeding (here, a public comment period) is complete. *See Int'l Snowmobile Mfrs. Ass'n*, 340 F. Supp. 2d at 1260–61. DOE previously hewed to "net-zero carbon policies . . . constraining energy production in pursuit of aggressive emissions targets."[146] Secretary Wright's predecessor, Jennifer Granholm, had

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[144] All Things with Kim Strassel, *supra* note 140, at landing page.

[145] Secretary Chris Wright (@SecretaryWright), X (Aug. 4, 2025, 10:08 AM), https://x.com/SecretaryWright/status/1952370967780454744; *see also* Kim LaCapria, *US Official Faces Backlash After Perpetuating Dangerous Claims in Recent Report: "This Destroys Wealth, Lives, and Livelihoods"*, Yahoo! News (Aug. 8, 2025, 6:05 AM EDT), https://www.yahoo.com/news/articles/us-official-faces-backlash-perpetuating-100500307.html.

[146] Robert Rapier, *Energy Secretary Wright Charts A New Direction In U.S. Energy Policy*, Forbes, (Feb. 7, 2025, 6:00 AM EST), https://www.forbes.com/sites/rrapier/2025/02/07/energy-secretary-wright-charts-a-new-direction-in-us-energy-policy/. Said policy was in keeping with the Executive Order then in place. *See* Exec Order No. 14,008, of Jan. 27, 2021, *Tackling the Climate Crisis at Home and Abroad*, 86 Fed. Reg. 7619, 7622-23 (Feb. 1, 2021) ("taking a government-wide approach to the climate crisis" and creating a National Climate Task Force, amongst other measures).

embraced and pursued the goals of "combating the climate crisis, creating clean energy union jobs, and promoting energy justice."[147] Before the current administration took office, DOE repeatedly acknowledged that "[c]limate change is intensifying and ravaging our communities and our planet [and aimed to] put America on an irreversible path to achieve net-zero carbon emissions by 2050."[148] The DOE policy change that Secretary Wright announced before the public comment period even commenced is drastic.

Not only has Secretary Wright prejudged the outcome of the public comment period, he and DOE are also using the Report as a pretext for his and the President's policy goal: slashing greenhouse gas regulations in the name of energy dominance. Pretext can be found where "an explanation for agency action [is proffered] that is incongruent with what the record reveals about the agency's priorities and decisionmaking process." *Dep't of Com. v. New York*, 588 U.S. 752, 785 (2019). Secretary Wright states in his Foreword that the Report is meant to "encourage a more thoughtful and science-based conversation about climate change and energy." CWG Report at viii. But in light of his other statements and actions, in the context of the simultaneous proposed rescission of EPA's Endangerment Finding, it is clear such a disclaimer is "contrived." *See Dep't of Com. v. New York*, 588 U.S. at 784–85; *see also id.* at 756 (requiring that "agencies offer genuine justifications for important decisions, reasons that can be scrutinized by courts and the interested public"). The Report is a pretext that cloaks Secretary Wright's motivation: to provide an imprimatur of legitimacy to fringe climate skepticism to advance his and the President's energy agenda.[149] Viewed as a whole, the Presidential directives, Secretary Wright's obedient and concurring statements, his choice of appointees to serve on the CWG, his statements on climate science, and the drastic change in agency policy show that the Secretary does not have a truly open mind on the questions addressed in the Report. In short, Secretary Wright unlawfully prejudged the outcome of this proceeding, and the reasons he has provided are pretextual. Accordingly, DOE must withdraw the Report.

3. DOE failed to comply with well-established scientific integrity standards.

DOE has not published a peer review of the CWG Report or the data and code underlying many of its analyses. Those failures violate multiple scientific integrity requirements, including policies from the Office of Management and Budget (OMB) and DOE implementing the Information Quality Act, Pub. L. No. 106-554, § 515, 114 Stat. 2763A (2000), and the Open,

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[147] *Secretary Granholm's Message to America*, DOE, https://www.energy.gov/articles/secretary-granholms-message-america (Feb. 25, 2021).

[148] *See id*.

[149] Similarly, the studies and findings invoked in the Report are used as pretexts to arrive at the predetermined outcome. Numerous scientists whose work is referenced in the Report have contested the Report's use and manipulation of said work. *See infra* notes 278, 315.

Public, Electronic, and Necessary (OPEN) Government Data Act, Pub. L. No. 115-435, 132 Stat. 5534 (2019).

i. Lack of Peer Review

DOE's work is subject to the requirements of OMB's Final Information Quality Bulletin for Peer Review, 70 Fed. Reg. 2664 (Jan. 14, 2005) (Information Quality Bulletin), issued pursuant to the Information Quality Act.[150] The Information Quality Bulletin requires DOE to conduct a peer review before disseminating any "influential scientific information" and imposes even stricter requirements for "highly influential scientific assessments." *Id*. at 2675.

"Scientific information" includes "analyses . . . or scientific assessments based on . . . life and earth sciences, engineering, or physical sciences." *Id*. "'[I]nfluential scientific information' means scientific information the agency reasonably can determine will have or does have a clear and substantial impact on important public policies or private sector decisions . . . ." *Id.* This includes any information that "may result in an annual effect on the economy of $100 million or more."[151] The term "highly influential scientific assessments" includes any influential scientific information that constitutes a scientific assessment and either "[c]ould have a potential impact of more than $500 million in any year, or . . . [i]s novel, controversial, or precedent-setting or has significant interagency interest." 70 Fed. Reg. at 2,675.

The CWG Report meets all of these definitions. "Secretary Wright assembled [the CWG] to write a report on issues in climate science relevant for energy policymaking[,]" purporting to focus on "scientific certainties and uncertainties in how anthropogenic carbon dioxide (CO_2) and other greenhouse gas emissions have affected, or will affect, the Nation's climate." CWG Report at ix, x. The Report contends that analyses underpinning recent climate policies "have overstated observed and likely future emission trends," that the cost of climate change is less than estimated in those policies, and that "U.S. policy actions are expected to have undetectably small direct impacts on the global climate." *Id.* at ix. The Report already threatens a major policy impact. In May 2025, less than two months after the CWG began work on it, DOE provided the Report to EPA, which then used it to examine the critical question of whether greenhouse gas emissions endanger human health and welfare. EPA relied upon the Report as a central basis for the proposed rescission of the 2009 Endangerment Finding and greenhouse gas emission standards for vehicles. *See* 90 Fed. Reg. at 36,292 n.10. EPA estimates that the Endangerment Finding

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[150] *See* Off. of Mgmt. & Budget, Exec. Off. of the President, OMB M-19-15, Memorandum for the Heads of Executive Departments and Agencies RE: Improving Implementation of the Information Quality Act, at 4 (Apr. 4, 2019), https://perma.cc/DF49-NDPP (OMB M-19-15).

[151] DOE, Final Report Implementing Updates to the Department of Energy's Information Quality Act Guidelines, at 12 (2019), https://perma.cc/99CJ-JAX5 (DOE Final Updated Information Quality Guidelines).

rescission will have a multi-billion-dollar yearly impact,[152] so the CWG Report easily crosses the $100 million and $500 million yearly thresholds. Furthermore, as Secretary Wright intended it to do, the CWG Report makes conclusions directly contrary to the most widely accepted overviews of climate science, showing that it is novel and controversial. *See, e.g.*, CWG Report at 11-21, 38, 57, 91, 95.

Because the CWG Report constitutes influential scientific information and a highly influential scientific assessment, it must comply with peer review requirements. Specifically, before dissemination[153] of the Report, a peer review must be conducted by a group of non-DOE employees that is "sufficiently broad and diverse to fairly represent the relevant scientific and technical perspectives and fields of knowledge." 70 Fed. Reg. at 2675–76. DOE must then disseminate a "peer review report" identifying the reviewers and summarizing their comments, as well as a written response to the peer review report. *Id.*

DOE has violated these requirements. As an initial matter, DOE clearly has disseminated the CWG Report. The Report bears DOE's seal, provides a suggested citation, and states that it "is being disseminated by the Department of Energy." CWG Report at i, iii. DOE's press release states that the Report "was published . . . as part of the U.S. Environmental Protection Agency's (EPA) proposed rule repealing the 2009 Endangerment Finding."[154] These documents do not refer to the Report as a draft.

Despite the requirements of the Information Quality Bulletin, no peer review has been published, and it appears that none was conducted.[155] "Peer review typically evaluates the clarity of hypotheses, the validity of the research design, the quality of data collection procedures, the robustness of the methods employed, the appropriateness of the methods for the hypotheses being tested, the extent to which the conclusions follow from the analysis, and the strengths and limitations of the overall product." 70 Fed. Reg. at 2665. "A high quality peer review can only be

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[152] EPA Off. of Transp. & Air Quality, Reconsideration of 2009 Endangerment Finding and Greenhouse Gas Vehicle Standards: Draft Regulatory Impact Analysis (EPA-420-D-25-003), at 20-22 (July 2025), https://perma.cc/6PFW-J32D.

[153] "The term 'dissemination' means agency initiated or sponsored distribution of information to the public." 70 Fed. Reg. at 2674 (internal citation omitted).

[154] DOE, *Department of Energy Issues Report Evaluating Impact of Greenhouse Gasses on U.S. Climate, Invites Public Comment, supra* note 132; *see also* DOE, *Climate* (archived Aug. 29, 2025), https://perma.cc/LC9P-8S9X (stating that DOE "published" the Report on July 29, 2025, and providing a summary of the Report's "find[ings]" and "conclu[sions]").

[155] Even if the CWG is considered to be a non-DOE entity, DOE's publication of the CWG Report meets the definition of dissemination because DOE's imprimatur and statements describing the report "suggest[] that [DOE] endorses or adopts the information" and "is using or proposing to use the information to formulate or support a regulation [or] guidance." DOE Final Updated Information Quality Guidelines, *supra* note 151, at 15.

conducted if the experts have sufficient insight and knowledge of the subject area to provide meaningful feedback for more information."[156]

Here, there was none. The Report states that DOE had "no editorial oversight" over the Report and that a "team of anonymous DOE and national lab reviewers [provided] input." CWG Report at x. One author stated that "eight scientists/administrators employed by the DOE" reviewed the Report, but she noted that the authors did not respond to the reviewers' comments and that there was no "formal" peer review.[157] It appears that three of the reviewers were not scientists, and that the reviewers may not have included any climate or physical scientists.[158] DOE plainly failed to assemble an appropriate review team, publish a peer review report and written response, identify the reviewers, and limit the reviewers to non-DOE employees. *See* 70 Fed. Reg. at 2675–76.

Moreover, the public comment period cannot substitute for peer review. As OMB explains, "[t]he mere existence of a public comment process . . . does not constitute adequate peer review or an 'alternative process,' because it does not assure that qualified, impartial specialists in relevant fields have performed a critical evaluation of the agency's draft product." *Id.* at 2672 (footnote omitted).[159]

The lack of peer review similarly violates DOE's scientific integrity policies, which require "appropriate technical peer review."[160] DOE has also violated Executive Order 14,303, *Restoring Gold Standard Science*, 90 Fed Reg. 22,601, 22602 (May 29, 2025) (*Gold Standard Science* EO), at § 3(a)(vii), which requires agencies' scientific endeavors to be "subject to unbiased peer review." And DOE has violated the directive in its own plan implementing the *Gold Standard Science* EO (*Gold Standard Science* Plan) to "ensure all scientific results, including agency-directed reports, undergo an enhanced scientific peer-review process by

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[156] DOE Off. of Energy Efficiency & Renewable Energy, EERE 810: Peer Review Guidance, 11 (June 2016), https://perma.cc/RNF5-MG8K.

[157] Curry, *New Climate Assessment Report from US DOE, supra* note 139.

[158] *See Heartland Inst.: Climate Realism Show: Episode 167*, *supra* note 143, at 39:56,(Curry stating that the review team included "five scientists" who were "a little bit more heavily biased in the direction of [agriculture] and land and forests . . . so we didn't have . . . a lot of what I would call climate, physics kind of people reviewing it"); *id.* at 1:00:10 (similar).

[159] *See also* 70 Fed. Reg. at 2665 ("Peer review should not be confused with public comment and other stakeholder processes. The selection of participants in a peer review is based on expertise, with due consideration of independence and conflict of interest. . . . [N]otice-and-comment procedures for agency rulemaking do not provide an adequate substitute for peer review.").

[160] DOE, DOE P 411.2B, DOE Scientific Integrity Policy, § 7(e) (Jan. 30, 2025), https://perma.cc/R64G-94AR; *see also* DOE, DOE O 411.2, Scientific Integrity Order, § 5(d)(2) (Jan. 4, 2017), https://perma.cc/5SZD-2VYK ("Scientific and technical objectivity should be supported through independent peer review . . . .").

domain experts."[161] The CWG Report's failure to seek thorough peer review and engage with diverse collaborators is also in conflict with the *Gold Standard Science* Plan's directive to advance science "through collaboration and interdisciplinary partnerships with academia, federal laboratories, [and] other funding agencies," and to rely upon "objective and unbiased . . . independent merit review by domain experts" when doing so.[162]

An example of a robust peer-review process can be seen in the development of NCA5—one of the documents that the CWG Report critiques. NCA5 was reviewed by an independent peer review committee established by the National Academies of Sciences, Engineering, and Medicine (NASEM).[163] NASEM also conducted a second peer review of its peer review report prior publication. The NASEM peer review report and the names, affiliations, and credentials of the peer reviewers were published in March 2023. NCA5 authors provided a narrative response to the peer review comments[164] as well as responses to every line-by-line comment received.[165]

In sum, the CWG Report is a paradigmatic example of a document that requires peer review. It purports to be a scientific assessment (not purely a policy document), and it seeks to upend the consensus on arguably the most impactful scientific issue of the 21st century. As described below, *see infra* Sections III.B.1, III.B.2, several scientists have already stated that their work was misconstrued in the CWG Report, providing a window into the crucial feedback that a peer review would have generated. Accordingly, DOE must withdraw the Report and conduct a full peer review.

ii. Open Data Requirements

Multiple laws and policies—including the Information Quality Act, the Open, Public, Electronic, and Necessary (OPEN) Government Data Act, implementing policies from OMB and DOE, the *Gold Standard Science* EO, and the *Gold Standard Science* Plan—require the

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[161] DOE, *Restoring Gold Standard Science DOE Implementation Plan* 1 (Aug. 22, 2025) https://perma.cc/68YY-8YT6 (*Gold Standard Science* Plan); *see also id.* at ii (emphasizing the ("use of the peer review process for building skepticism into the process of disseminating scientific results").

[162] *See id.* at 2, 3.

[163] Nat'l Acads. of Scis., Eng'g, & Med., Review of the Draft Fifth National Climate Assessment (Nat'l Acads. Press 2023). https://perma.cc/C5AH-CVBL.

[164] Allison Crimmins, U.S. Glob. Change Rsch. Program: 5th Nat'l Climate Assessment, Narrative Response to the National Academies of Sciences, Engineering, and Medicine's Review of the Third Order Draft of the Fifth National Climate Assessment (NCA5) (Oct. 24, 2023), https://web.archive.org/web/20250630000751/https://nca2023.globalchange.gov/downloads/NCA5_Narrative-Response-to-NASEM-Review.pdf.

[165] U.S. Glob. Change Rsch. Program: 5th Nat'l Climate Assessment, NCA5 Authors' Responses to the NASEM Review Panel's Line-by-Line Comments on NCA5 (2023), https://web.archive.org/web/20250629110705/https://nca2023.globalchange.gov/downloads/NCA5_Author-Responses-to-NASEM.pdf.

government to provide public access to data and code underlying its scientific publications. Put simply, the authors need to "show their work." Much of the CWG Report involves original analyses, but the data and code underlying those analyses are not publicly available, in contravention of these open data requirements.

OMB guidelines state that agencies "shall generally require sufficient transparency about data and methods that an independent reanalysis could be undertaken by a qualified member of the public."[166] Agencies are "require[d]" under the OPEN Government Data Act and OMB policies "to collect and create information in a way that supports public transparency as well as downstream, secondary information dissemination and processing by third parties."[167] And when "an agency has performed analysis using a specialized set of computer code, the computer code used to process it should be made available to the public for further analysis, if consistent with applicable law and policy."[168] Similarly, section 4(b)(i)(A) of the *Gold Standard Science* EO requires agencies to "make publicly available . . . the data, analyses, and conclusions associated with scientific and technological information produced or used by the agency that the agency reasonably assesses will have a clear and substantial effect on important public policies." And in the *Gold Standard Science* Plan, DOE likewise promised to "maximize appropriate sharing of scientific data and code," as well as "produce results that can be replicated or validated by third parties."[169]

To this end, DOE guidelines state that "a high degree of transparency of data and methods should be ensured to facilitate the reproducibility of [influential scientific] information by qualified third parties."[170] Data underlying DOE research should generally be "publicly shared and preserved in a timely and equitable manner that enables validation and replication of results."[171]

Various parts of the CWG Report contain the authors' original analyses, *e.g.*, Figures 6.2.1, 6.3.3, 6.3.4, 6.3.5, 6.3.6, but the public does not have access to the underlying data and code. DOE's release of the CWG Report is inconsistent with open-data requirements. This

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[166] Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity of Information Disseminated by Federal Agencies, 67 Fed. Reg. 8452, 8460 (Feb. 22, 2002) (implementing the Information Quality Act).

[167] OMB M-19-15, *supra* note 150, at 5.

[168] OMB M-19-15, *supra* note 150, at 8.

[169] *Gold Standard Science* Plan, *supra* note 161, at 1, ii, 1.

[170] DOE Final Updated Information Quality Guidelines, *supra* note 151, at 17.

[171] DOE, Public Access Plan 13 (June 2023), https://perma.cc/B8SJ-9HGJ; *see also* DOE Off. of Sci., Statement on Digital Data Management (2022) (requiring research proposals to include a plan for sharing and preserving data or justify not doing so), https://perma.cc/CN29-SYYG.

provides yet another reason the Report should be withdrawn, at least pending release of all relevant data.

iii. Communication of Uncertainty

The CWG Report also violates the *Gold Standard Science* Plan's requirements for the communication of uncertainty. The Plan directs DOE to "communicat[e] . . . as appropriate, methodological constraints, assumptions, uncertainties, and confidence intervals associated with results."[172] The Report fails to do so. For instance, the Report claims that there are uncertainties in calculating the social cost of carbon, CWG Report at 125, but rather than establish "confidence intervals" to explain this alleged uncertainty, the Report foregoes estimating the social cost entirely. The CWG Report also makes a practice of asserting that certain trends are "exaggerated" or that "biases have not been completely" accounted for, CWG Report at viii, ix, 8, 21, but then fails to provide any estimate or range of estimates reflecting this supposed uncertainty. Furthermore, as a general matter, the CWG Report does not caveat its conclusions by disclosing the authors' level of confidence in those conclusions.

The CWG Report's failures on this front contrast with the practices of international and national climate assessments. The IPPC, for instance, qualifies each of its conclusions with a level of confidence.[173] This is a model of transparent communication about uncertainty. The CWG Report is not, nor is it consistent with DOE's obligations under the *Gold Standard Science* Plan.

B. The CWG Report is substantively flawed.

DOE's rushed process, failure to follow uniform standards and procedures and transparency requirements, and violation of scientific integrity principles like peer review and open data have resulted in a document that is blatantly wrong on the substance. On each topic it addresses, the Report's conclusions are unsupported and unsupportable. And the Report fails to contend with the massive social cost of carbon that our States and Local Governments face that will increase absent bold federal action to firmly acknowledge, seriously study, and meaningfully address climate change. Moreover, insofar as DOE would claim deference on the Report's conclusions, none is warranted: DOE is not even an expert agency on climate change, and the purportedly scientific findings of a handful of cherry-picked climate skeptics do not meet scientific standards for reliability.

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[172] *Gold Standard Science* Plan, *supra* note 161, at 2.

[173] *See* IPCC, Guidance Note for Lead Authors of the IPCC Fifth Assessment Report*, supra* note 2.

1. The CWG Report's scientific analyses are erroneous and misleading.

Climate science is a vast and complex field. Prior efforts to encapsulate the subject have taken years of work by thousands of scientists. As described *supra* Section II, the science amply documents that human-induced climate change is already endangering public health and welfare through rising temperatures, increases in extreme weather events, threats to our electricity grid and other infrastructure, ozone pollution, damages to fisheries and other marine life, and harms to agricultural production, among many other impacts. The CWG Report seeks to critique large swathes of this multifaceted body of science, but was written in less than two months by five contrarian scientists lacking in sufficient scientific training and expertise over all of the relevant fields of science covered in the Report. Unsurprisingly, the Report does not reflect a faithful description of the state of climate science. Errors, omissions, and mischaracterizations abound. The following section provides a small sampling of these many and significant shortfalls.

i. Sea Level Rise

As the CWG Report notes, global-mean sea level has risen about eight inches since 1900, and this rise is "unambiguously associated with increasing temperatures." CWG Report at 75. Nonetheless, the CWG Report claims that "U.S. tide gauge measurements in aggregate show no obvious acceleration in sea level rise beyond the historical average rate." *Id.* at ix, 75. The Report provides no systematic, statistical analysis to support this claim. *Id.* at 75-80. It also ignores the substantial analyses and literature documenting sea-level acceleration both in the global mean[174] and at regional scales.[175]

The scientific literature shows that sea-level rise has accelerated in the United States. Sweet et al. (2022) analyzes aggregate tide gauge measurements in the contiguous United States and confirms an aggregate acceleration in sea-level rise since the 1970s, driven particularly by

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[174] Anny Cazenave et al., *Contemporary Sea-Level Changes from Global to Local Scales: A Review,* 478 (2261) Proc. of the Royal Soc'y A: Mathematical, Physical & Eng'g Scis.*,* (May 2022), https://perma.cc/NGN2-JZ7K; Sönke Dangendorf et al., *Probabilistic Reconstruction of Sea-Level Changes and Their Causes since 1900,* 16 (7) Earth Sys. Sci. Data 3471–3494 (July 31, 2024), https://perma.cc/J54U-W8WS; IPCC Physical Science AR6, *supra* note 7, ch. 9: Ocean Cryosphere and Sea-Level Change, at 1211–1362; B. D. Hamlington et al., *The Rate of Global Sea Level Rise Doubled During the Past Three Decades*, 5 (601) Nature Commc'ns Earth & Env't (Oct. 17, 2024), https://perma.cc/U6TV-UCC4.

[175] Sönke Dangendorf et al., *Acceleration of U.S. Southeast and Gulf Coast Sea-Level Rise Amplified by Internal Climate Variability*, 14 (1935) Nature Commc'ns (Apr. 10, 2023), https://perma.cc/NX6E-4HKD; Tal Ezer, *Sea Level Acceleration and Variability in the Chesapeake Bay: Past Trends, Future Projections, and Spatial Variations Within the Bay,* 73 Ocean Dynamics 23–34 (Dec. 27, 2022), https://doi.org/10.1007/s10236-022-01536-6 (attached as Exhibit W); Robert E. Kopp, *Does the Mid-Atlantic United States Sea Level Acceleration Hot Spot Reflect Ocean Dynamic Variability?*, 40 (15) Geophysical Rsch. Letters 3981–3985 (Aug. 2013), https://perma.cc/2HEF-MWBF.

acceleration along the Atlantic and Gulf Coasts.[176] Using a different statistical method, Piecuch (2025) demonstrates a sustained acceleration in contiguous U.S. sea level since 1900.[177]

The CWG Report performs no statistical analysis to test for acceleration. Instead, it selectively shows graphs of linear fits for four selected U.S. tide gauges, and presents tabular results for these four gauges and a fifth, unplotted tide gauge. The Report provides no rationale for how these five gauges were selected for presentation from among the 141 actively updated, long-duration NOAA tide gauges.[178] In contrast with the Report's untested assumption of linearity, an interagency analysis led by the National Aeronautics and Space Administration's (NASA), NOAA, and U.S. Geological Survey shows that four of the five tide gauges highlighted in the CWG Report show an increase in the rate of sea-level rise (i.e., an acceleration) of at least 1.5 inches/decade between the 1970s and the 2010s.[179]

ii. Direct Impacts of CO_2 on the Environment

The CWG Report purports to analyze two aspects of the impact of CO_2 emissions on the planet: the carbon fertilization effect, and ocean acidification. Neither analysis is an accurate or complete description of the evidence.

The carbon fertilization effect. First, the Report argues that increased CO_2 concentrations are beneficial because they "promot[e] plant growth by enhancing photosynthesis and improving water use efficiency." CWG Report at 3. This phenomenon is often called the carbon fertilization effect. The Report discusses the effects of increased CO_2 on agriculture and the level of vegetation across the planet, asserting that these effects are largely ignored in mainstream climate science. CWG Report at 6. In fact, the carbon fertilization effect is well studied in the

[176] W. V. Sweet et al., NOAA, Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines (NOAA Technical Report No. NOS 01), at xii–xiii, 15–16, (2022), https://perma.cc/ZW4R-5MMV; *see also* Jennifer S. Walker et al., *Common Era Sea-Level Budgets Along the U.S. Atlantic Coast*, 12 (1841) Nature Commc'ns (Mar. 23, 2021), https://perma.cc/GGE8-JHVT.

[177] Christopher G. Piecuch, Woods Hole Oceanographic Inst., *The Rate of U.S. Coastal Sea-Level Rise Doubled in the Past Century* (Aug. 15, 2025) (unpublished manuscript) (on file with ESS Open Archive), https://perma.cc/B6YT-XUYT.

[178] *Sea Level Trends: U.S. Linear Relative Sea Level (RSL) Trends and 95% Confidence Intervals (CI) in mm/Year and in ft/Century*, NOAA Tides & Currents (archived Aug. 29, 2025), https://perma.cc/WN7M-88UE.

[179] *See National Sea Level Explorer: Explore Sea Level Change in the Coastal U.S.*, U.S. Interagency Task Force on Sea Level Change (last visited Aug. 28, 2025), https://earth.gov/sealevel/us/national-sea-level-explorer/.

peer-reviewed literature[180] but, as described *infra* Section III.B.2, is predicted to be negated by other effects of climate change.

The CWG Report's conclusion about increased agricultural yields depends on flawed studies and ignores important findings in the literature. CWG Report at 3, 104–108. Importantly, the laboratory experiments discussed in the CWG Report do not reflect real-world growing conditions. They can inform our understanding of fertilization effects, but are less informative than state-of-the-art FACE (free air CO_2 enrichment) studies, which are conducted in situ. Ainsworth and Long (2021)[181] summarize the results of 30 years of FACE studies over 14 sites and 5 continents. They find that "elevation of [CO_2] by [about] 200 ppm caused a [carbon fertilization effect (CFE) of approximately] 18% increase in yield under non-stress conditions," which the CWG Report correctly cites. Ainsworth and Long (2021), however, also find that rising temperatures, wet and drought conditions, and soil characteristics (e.g. nitrogen deficiency) negatively affect crop productivity. They also report reduced levels of nutrients in most crops under carbon fertilization, and lower nitrogen and protein in the seeds of non-leguminous crops. The relevant inquiry is not whether CO_2 fertilization is beneficial to plants—it often is—but rather how the stress of climate change affects agriculture long term.

With its selective emphasis on the benefits, the CWG Report ignores the research showing that the carbon fertilization effect will be counteracted by other effects of climate change. For example, Zhu (2023)[182] is a meta-regression analysis of 86 studies of four major crops and their seed yield responses to simultaneous increases in CO_2 and temperature. This analysis finds that carbon fertilization effects on seed yield will likely be greatly reduced or entirely negated by temperature stress effects on all crops in the study other than soy.[183] The CWG Report's non-methodological analysis fails to rebut the robust conclusions of the literature. The CWG Report also ignores the consensus in the peer-reviewed literature that climate change

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[180] In contrast, the studies cited in the CWG Report are taken from co2science.org, a website that does not produce peer-reviewed literature but rather highlights only research finding benefits of CO2 fertilization.

[181] Elizabeth A. Ainsworth & Stephen P. Long ,*30 Years of Free-Air Carbon Dioxide Enrichment (FACE): What Have We Learned About Future Crop Productivity and Its Potential for Adaptation?* 27 (1) Glob. Change Biology 27-49 (Jan. 2021), https://onlinelibrary.wiley.com/doi/epdf/10.1111/gcb.15375 (attached as Exhibit X).

[182] Chunwu Zhu, et al., Rising Temperatures Can Negate CO2 Fertilization Effects on Global Staple Crop Yields: A Meta-Regression Analysis", 342 (109737) Agricultural Agric. and & Forest Meteorology 342, (Nov. 2023), https://perma.cc/GJY6-DQ8V.

[183] *Id.*; *see also, e.g.*, Jacob Schewe et al., *Multimodel Assessment of Water Scarcity Under Climate Change,* 111 (9) Proc. Nat'l Acad. Scis. 3245, 3245 (Mar. 4, 2014), https://perma.cc/3K3X-N5TF (finding that "climate change is likely to exacerbate regional and global water scarcity considerably," and noting that water scarcity "impairs food security").

will have detrimental effects on agriculture in the major growing regions of the United States and for most of the world.[184]

The CWG Report's related argument that increased global vegetation, described as "global greening," demonstrates benefits of CO_2 emissions likewise falls short. *See* CWG Report at 3–6. AR6's Special Report on Climate Change and Land notes that a significant amount of greening has occurred due to afforestation and croplands, rather than a generalized carbon fertilization effect.[185] And "[p]rojected increases in drought conditions in many regions suggest long-term global vegetation greening trends are at risk of reversal to browning in a warmer climate."[186] Similarly, the AR6 Report on Impacts, Adaptation and Vulnerability concludes with high confidence that "carbon uptake services [in terrestrial ecosystems] linked to CO_2 fertilisation effects are being increasingly limited by drought and warming."[187] Research also suggests that "CO_2 fertilisation [in tropical forests] is outweighed by the impacts of higher temperatures and drought that enhance tree mortality and diminish growth."[188] Furthermore, evidence indicates that the carbon fertilization effect has been weakening over time[189] and may decrease biodiversity.[190]

Even in ecosystems where greening occurs, the ecosystems may become less able to absorb carbon, thus exacerbating climate change.[191] Chen et al. (2024) find that the Amazon rainforest biome shifted from being a net absorber of carbon dioxide in the period from 1901 to 1959 to becoming a net carbon emitter in the period from 1960 to 2021.[192] And Wang et al.

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[184] *See infra* Section III.B.2.

[185] P.R. Shukla, et al., *Summary for Policymakers, In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*, IPCC, ch. 2, Land-Climate Interactions, § 2.2.4, at 143–144 (2019), https://perma.cc/B4FR-PTPK.

[186] *Id.*

[187] IPCC Impacts AR6, *supra* note 44, at 47.

[188] *Id.* at 273–74.

[189] *Id.* at 251; *see also* Baozhang Chen et al., *Inhibitive Effects of Recent Exceeding Air Temperature Optima of Vegetation Productivity and Increasing Water Limitation on Photosynthesis Reversed Global Greening*, 10 (11) Earth's Future (Nov. 2022), https://perma.cc/5TSE-L6BA (finding that greening was "reversed . . . around the year 2000 over 90% of the global vegetated area").

[190] Oliver L. Phillips et al., *Increasing Dominance of Large Lianas in Amazonian Forests*, 418 Nature 770–774 (Aug. 15, 2002), https://perma.cc/Z4HM-66AA.

[191] *See* Bin Chen et al., *Carbon Dioxide Fertilization Enhanced Carbon Sink Offset by Climate Change and Land Use in Amazonia on a Centennial Scale*, 955 (176903) Sci. Total Env't (Dec. 10, 2024), https://doi.org/10.1016/j.scitotenv.2024.176903 (attached as Exhibit Y); Songhan Wang et al., *Recent Global Decline of CO_2 Fertilization Effects on Vegetation Photosynthesis*, 370 (6522) Sci. 1295-1300 (Dec. 2020), https://www.science.org/doi/epdf/10.1126/science.abb7772 (attached as Exhibit Z).

[192] Bin Chen et al., *supra* note 191.

(2020)[193] examine long-term satellite and ground-based data sets and find that global carbon fertilization effects have declined across most terrestrial regions of the globe from 1982 to 2015, correlating with changing nutrient availability and soil water. They conclude that "[t]his declining trend in the forcing of terrestrial carbon sinks by increasing amounts of atmospheric CO_2 implies a weakening negative feedback on the climatic system and increased societal dependence on future strategies to mitigate climate warming." The CWG Report does not account for these findings.

Ocean acidification. The CWG Report claims that ocean acidification is not a cause for concern and asserts that much of the science on this topic is not robust. The Report states that the oceans are presently alkaline and will only become neutralized as pH decreases. CWG Report at 6–8. These misleading claims ignore the vast majority of the literature and fail to rebut the widespread consensus on the dangers of ocean acidification.

Specifically, the Report asserts:

> Even if the water were to turn acidic, it is believed that life in the oceans evolved when the oceans were mildly acidic with pH 6.5 to 7.0. On the time scale of thousands of years, boron isotope proxy measurements show that ocean pH was around 7.4 or 7.5 during the last glaciation (up to about 20,000 years ago) increasing to present-day values as the world warmed during deglaciation. Thus, ocean biota appear to be resilient to natural long-term changes in ocean pH since marine organisms were exposed to wide ranges in pH.

CWG Report at 7 (citation omitted).

These statements ignore important aspects of present and past circumstances. During the last glaciation (the time period mentioned in the above quote), various species suffered significant decreases in weight, thus undercutting claims that ocean biota will not be affected.[194] Moreover, the current rate of ocean acidification is faster than at any time in the past 300 million years.[195] For instance, the most recent de-glacial transition phase was "two orders of magnitude slower."[196] Another example is the period 56 million years ago known as the Paleocene-Eocene Thermal Maximum, which is generally considered to be the closest analog to current climate

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[193] Songhan Wang et al., *supra* note 191.

[194] Bärbel Hönisch et al., *The Geological Record of Ocean Acidification*, 335 (6072) Sci. 1058, 1060 (Mar. 2, 2012), https://www.science.org/doi/10.1126/science.1208277 (attached as Exhibit AA).

[195] *Id.* at 1058.

[196] *Id.* at 1062.

change.[197] That period is associated with the largest extinction among deep-sea sediment invertebrates of the past 75 million years and other major shifts in marine life, which were likely caused in part by ocean acidification.[198] Current acidification is occurring almost 10 times as fast.[199]

Ocean pH is expected to continue changing based on current and future greenhouse gas emissions.[200] And there is strong scientific evidence that the current pace and scale of changes in ocean pH will have a variety of impacts on ocean biota, including commercially important marine fisheries, which would in turn impact the many businesses, communities, and economies that depend on them.[201] The IPCC AR6 concludes with high confidence that ocean warming and acidification have already reduced production from fisheries and shellfish aquaculture in some regions.[202]

The Report also ignores the fact that biological response to changing ocean pH is more complicated than survival or mortality alone. For example, adult scallops are known to eat less when CO_2 is high,[203] which has implications for growth rates. These impacts would not necessarily affect a species' survival but would have consequences for food production and conservation efforts. Calcifying organisms (from small plankton, to oysters, to larger coral-reef building organisms) require more energy to respond to stressors like ocean acidification, which can have consequences for growth and reproduction. For example, oysters have been shown to experience mortality if exposed to high CO_2 levels during their first 48 hours of life.[204] Lastly, the impacts of ocean acidification on ocean biota will worsen with continued greenhouse gas emissions.[205]

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[197] *Id.* at 1060; Lee R. Kump et al., *Ocean Acidification in Deep Time,* 22 (4) Oceanography 94-107, at 103-104 (Dec. 2009), https://perma.cc/AN6E-29DZ.

[198] Hönisch et al., *supra* note 194, at 1060; Kump et al., *supra* note 197, at 104.

[199] Hönisch et al., supra note 194, at 1060.

[200] IPCC Impacts AR6, *supra* note 44, at 396.

[201] *Id.* at 48.

[202] *Id.* at 9.

[203] Emilien Pousse et al., *Juvenile Atlantic Sea Scallop*, *Placopecten magellanicus*, *Energetic Response to Increased Carbon Dioxide and Temperature Changes*, PLOS climate (Feb. 22, 2023), https://journals.plos.org/climate/article?id=10.1371/journal.pclm.0000142 (attached as Exhibit BB).

[204] Alan Barton et al., The Pacific Oyster, *Crassostrea gigas*, Shows Negative Correlation to Naturally Elevated Carbon Dioxide Levels: Implications for Near-Term Ocean Acidification Effects, 57 (3) *Limnology and Oceanography* 671-896 (May 2012) https://aslopubs.onlinelibrary.wiley.com/doi/epdf/10.4319/lo.2012.57.3.0698 (attached as Exhibit CC).

[205] IPCC Impacts AR6, *supra* note 44, at 48, 406; NCA5, *supra* note 1, ch. 10, Ocean Ecosystems and Marine Resources.

iii. Human Influences on the Climate

The CWG Report downplays the influence of human-induced greenhouse gas emissions on climate change, emphasizing the natural variability of the global climate, the planet's capacity to absorb CO_2, and other purported uncertainties and flaws in climate science. CWG Report 11–21.

The Report's cursory review of a small fraction of the relevant literature does not undermine the robust consensus of the scientific community. IPCC Physical Science AR6, which represents the scientific community's best summation of the literature on anthropogenic climate change, concludes:

> Human influence on the climate system is now an established fact. . . . It is unequivocal that the increase of CO_2, methane (CH_4) and nitrous oxide (N_2O) in the atmosphere over the industrial era is the result of human activities and that human influence is the main driver of many changes observed across the atmosphere, ocean, cryosphere and biosphere.
>
> …
>
> [O]ver the past several decades, key indicators of the climate system are increasingly at levels unseen in centuries to millennia and are changing at rates unprecedented in at least the last 2000 years.[206]

The CWG Report does not rebut these conclusions. For example, the CWG Report critiques the IPCC's use of the RCP 8.5 scenario (an early scenario involving radiative forcing of 8.5 watts per square meter by the year 2100) as implausible. Although there is a growing consensus among climate scientists that RCP 8.5 is unlikely, it is just one of many scenarios analyzed by the IPCC.[207] The other scenarios, while less extreme, involve significant and lasting harms to the environment, public health and welfare, and economies in the U.S. and throughout the world. The CWG Report's critique of this single scenario—which was intended to provide an upper-end scenario of possible warming—ignores the fact that climate models have proven to be quite accurate and that developments in climate science since the RCP 8.5 was first developed have reduced the uncertainty associated with these scenarios.

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[206] IPCC Physical Science AR6, *supra* note 7, at 41.

[207] Furthermore, carbon-cycle feedback effects could plausibly lead to radiative forcing of 8.5 W/m^2. *See* Zeke Hausfather & Richard Betts, *Analysis: How "Carbon-Cycle Feedbacks" Could Make Global Warming Worse*, CarbonBrief: Climate Modeling (Apr. 14, 2020, 4:49 PM), https://perma.cc/V52D-K84K.

Furthermore, the IPCC no longer uses the RCP pathways as its primary scenarios.[208] As explained in IPCC Physical Science AR6:

> The AR6 assessment of future change in global surface temperature is, for the first time in an IPCC report, explicitly constructed by combining new projections for the [Shared Socioeconomic Pathway] scenarios with observational constraints based on past simulated warming as well as the AR6-updated assessment of equilibrium climate sensitivity and transient climate response. In addition, climate forecasts initialized from the observed climate state have been used for the period 2019–2028. The inclusion of additional lines of evidence has reduced the assessed uncertainty ranges for each scenario . . . .[209]

The CWG Report also downplays the risks of climate change by pointing to models showing increased CO_2 uptake on land and/or in oceans. The scientific consensus, however, concludes that the net carbon sink activities of the carbon fertilization effect is likely to be counteracted by increases in emissions from soils and vegetation due to climate change.[210] Meanwhile, the capacity for the ocean to act as a carbon sink is likely to be limited by emerging carbon-climate feedbacks.[211] Projections show that the ocean and land sinks will stop growing from the second part of the 21st century under all emissions scenarios.[212]

Finally, the CWG Report claims there is evidence that urbanization biases in the land warming record have not been completely removed from climate data sets. CWG Report at 20–21. But urbanization has a negligible effect on global surface temperature overall.[213] Moreover, urbanization is incorporated into climate modeling in spatial patterns emphasizing the regional

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[208] IPCC Physical Science AR6, *supra* note 7, at 52.

[209] *Id.* at 60.

[210] P.R. Shukla, et al., *Summary for Policymakers, In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*, at 10, IPCC (2019), https://perma.cc/TL9G-327D; *see also supra* Section III.B.1.ii.

[211] Jens Daniel Müller et al., *Decadal Trends in the Oceanic Storage of Anthropogenic Carbon from 1994 to 2014,* AGU Advances, 4 (e2023AV000875) (Aug. 10, 2023), https://perma.cc/C9SZ-72AW; Tereza Jarníková et al., *Decreasing Importance of Carbon-Climate Feedbacks in the Southern Ocean in a Warming Climate,* 11 (20) Sci. Advances (May 16, 2025), https://perma.cc/5L32-NUH7; Nicolas Gruber et al., *Trends and Variability in the Ocean Carbon Sink,* 4 Nature Revs. Earth & Env't 119–134 (Jan. 24, 2023), https://doi.org/10.1038/s43017-022-00381-x (attached as Exhibit DD).

[212] IPCC Physical Science AR6, *supra* note 7, at 80.

[213] *Id.* at 144; *see also* Zeke Hausfather et al., *Quantifying the Effect of Urbanization on U.S. Historical Climatology Network Temperature Records*, 118 (2) J. Geophysical Rsch.: Atmospheres 481–494 (Jan. 30, 2013), https://perma.cc/JN8N-2388.

character of land use and land management, such as changes to albedo.[214] Thus, this critique is unfounded.

iv. Climate Models

More broadly, the CWG Report argues that climate models cannot be trusted as a source of accurate climate change prediction because they "generally run 'hot' in their description of the climate of the past few decades." CWG Report at ix.

Climate models are a well-respected and highly reviewed area of climate research. These models undergo extensive quality assessment, quality control, and third-party verification.[215] Nearly all model code and data inputs and results are available publicly as a condition of publication.[216] Climate model outputs are collected to create a well-rounded understanding of the most likely scenarios for the future, such as the Coupled Model Intercomparison Project Phase 6 (CMIP6) ensemble that the CWG Report cites. CMIP6 includes 23 endorsed models,[217] each with specific strengths and weaknesses. The consensus in the field is that models are to be used for their intended use-cases, such as precipitation forecasts or tropical storm projections, not as a catch-all for future changes.[218] The CWG Report's criticisms do not detract from the robust literature supporting the use of these models.

As a general point, the CWG Report's criticisms are largely directed at older climate models. *See* CWG Report at 26. The IPCC's Sixth Assessment Report explains recent improvements in modeling:

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[214] IPCC Physical Science AR6, supra note 7, at 310, 324.

[215] *See generally* IPCC Physical Science AR6, *supra* note 7, ch. 9, Evaluation of Climate Models, https://perma.cc/5NJ6-YXNN; Hausfather et al., *Evaluating the Performance of Past Climate Model Projections, supra* note 22; David C. Bader et al., U.S. Climate Change Sci. Program & Subcommittee on Glob. Change Rsch., *Climate Models: An Assessment of Strengths and Limitations (Synthesis and Assessment Product 3.1)* (July 2008), https://perma.cc/PHD6-PUAC.

[216] *E.g.* Neil C. Swart et al., *The Canadian Earth System Model Version 5 (CanESM5.0.3),* 12 (11) Geoscientific Model Dev. 4823–4873 (Nov. 25, 2019), https://perma.cc/CS84-DMSV; Hans Hersbach et al., *The ERA5 Global Reanalysis*, 146 (730) Q. J. Royal Meteorological Soc'y 1999–2049 (2020), https://perma.cc/28Z2-2393.

[217] *CMIP6 Multi-Model Ensembles Model List,* Gov't of Can.: Canadian Climate Data & Scenarios (archived Aug. 26, 2023), https://perma.cc/WYU2-AKJ5; *CMIP Phase 6 (CMIP6)*, World Climate Rsch. Program: Coupled Model Intercomparison Project (archived Aug. 26, 2025), https://perma.cc/C3XY-62LK.

[218] Najeebullah Khan et al., *Global Climate Models Performance: A Comprehensive Review of Applied Approaches, Recognized Issues and Possible Future Directions*, 326 (108300) Atmospheric Rsch. (Nov. 2025) https://doi.org/10.1016/j.atmosres.2025.108300 (attached as Exhibit EE); David W. Pierce et al., *Selecting Global Climate Models for Regional Climate Change Studies*, 106 (21) Proc. Nat'l Acad. Scis. 8441-8446 (May 26, 2009), https://perma.cc/BWT9-XFN8.

> The latest generation of complex climate models has an improved representation of physical processes, and a wider range of Earth system models now represent biogeochemical cycles. Since AR5, higher-resolution models that better capture smaller-scale processes and extreme events have become available. Key model intercomparisons supporting this Assessment include the Coupled Model Intercomparison Project Phase 6 (CMIP6) and the Coordinated Regional Climate Downscaling Experiment (CORDEX), for global and regional models respectively. Results using CMIP Phase 5 (CMIP5) simulations are also assessed. Since AR5, large ensemble simulations, where individual models perform multiple simulations with the same climate forcings, are increasingly used to inform understanding of the relative roles of internal variability and forced change in the climate system, especially on regional scales. The broader availability of ensemble model simulations has contributed to better estimations of uncertainty in projections of future change (high confidence).[219]

More specifically, the CWG Report contends that the climate models are inaccurate with regard to surface warming, tropospheric warming, stratospheric cooling, and the U.S. Corn Belt. These arguments characterize the data unfairly and rely on faulty studies.

Surface warming. The CWG Report argues that climate models of surface warming exhibit warming biases and that the IPCC has only incompletely addressed this issue. *See* CWG Report at 33–34. In fact, the literature has extensively explored the reasons that some models run hotter,[220] and the IPCC thoroughly accounted for these variations in AR6's treatment of the CMIP6 ensemble (for example, through observational constraint[221] and weighted average[222]). The CWG Report relies heavily on the work of Scafetta (2023)[223] to support its claims about the supposed inaccuracy of climate models. *See, e.g.*, CWG Report at 33 & Figure 5.2. Scafetta (2023)'s methodologies, however, are thoroughly rebutted by Schmidt et al. (2022) (analyzing a

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[219] IPCC Physical Science AR6, *supra* note 7, at 151.

[220] *E.g.* Mark D. Zelinka et al., *Causes of Higher Climate Sensitivity in CMIP6 Models*, 47 (1: e2019GL085782) Geophysical Rsch. Letters, (Jan. 16, 2020), https://perma.cc/V52F-8CG7.

[221] *E.g.* Yongxiao Liang et al., *Climate Model Projections of 21st Century Global Warming Constrained Using the Observed Warming Trend,* 47 (12: e2019GL086757) Geophysical Rsch. Letters (June 28, 2020), https://perma.cc/5DCH-QUMJ.

[222] Zeke Hausfather et al., *Climate Simulations: Recognize the "Hot Model" Problem*, 605 Nature: Comment 26-29 (May 4, 2022), http://dx.doi.org/10.1038/d41586-022-01192-2 (attached as Exhibit FF).

[223] Nicola Scafetta, *CMIP6 GCM Ensemble Members Versus Global Surface Temperatures*, 60 Climate Dynamics 60 3091–312 (Sept. 18, 2022), https://perma.cc/ME72-FWXJ. This article was published online in 2022, hence the Schmidt et al. (2022) rebuttals.

related paper by Scafetta) and other writings from Schmidt.[224] For example, Scafetta (2023) incorrectly analyzes internal and interannual variability in model outputs, which is important in modeling long term climate change (in this case, decadal temperature change).[225] Additionally, Scafetta categorizes the models into low, middle, and high climate sensitivity groups, which do not match up with the ranges used in the dominant literature and whose cut-offs are necessary for Scafetta's conclusions.[226]

Next, CWG Report Figure 5.3 claims to show a trend in models producing more warming than observed from 1979 to 2024. *See* CWG Report at 33–34. The chart shows 30 models, but not all are endorsed by CMIP6.[227] CWG Report Figure 5.3 is taken from a policy brief authored by Roy Spencer, one of the authors of the CWG Report. It is not from a refereed or peer-reviewed journal and not an appropriate source for reliable information on climate science.

As illustrated in Figure 3.4 from IPCC Physical Science AR6 (reproduced below), the CMIP6 model average shows that models are not producing more warming than observed for global mean surface air temperature.

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[224] Gavin A. Schmidt et al., *Comment on "Advanced Testing of Low, Medium, and High ECS CMIP6 GCM Simulations Versus ERA5-T2m" by N. Scafetta (2022)*, 50 (18) Geophysical Rsch. Letters (Sept. 28 2023), https://perma.cc/W5CF-4YWY; *see also* Gavin Schmidt, *Scafetta Comes Back for More,* Real Climate: Climate Modelling (Oct. 10, 2022), https://perma.cc/M4GN-X94W. Schmidt is the Director and Principal Investigator for NASA's Goddard Institute for Space Studies (GISS) ModelE Earth System Model in New York. Schmidt is also an author of the Hausfather et al. (2022), *supra* note 222, study in *Nature* that originally describes the "hot models" question in climate modeling.

[225] *See* Schmidt et al., *Comment on "Advanced Testing of Low, Medium, and High ECS CMIP6 GCM Simulations Versus ERA5-T2m" by N. Scafetta*, *supra* note 224; Gavin Schmidt, *Scafetta Comes Back for More*, Real Climate: Climate Modelling (Oct. 10, 2022), https://perma.cc/M4GN-X94W.

[226] Schmidt, *Scafetta comes back for more*, *supra* note 225; *see also* Gavin Schmidt, *The Scafetta Saga*, Real Climate: Climate Modelling (Sept. 21, 2023), https://perma.cc/U93Q-SKL4.

[227] CMIP6 Multi-Model Ensembles Model List, *supra* note 217.

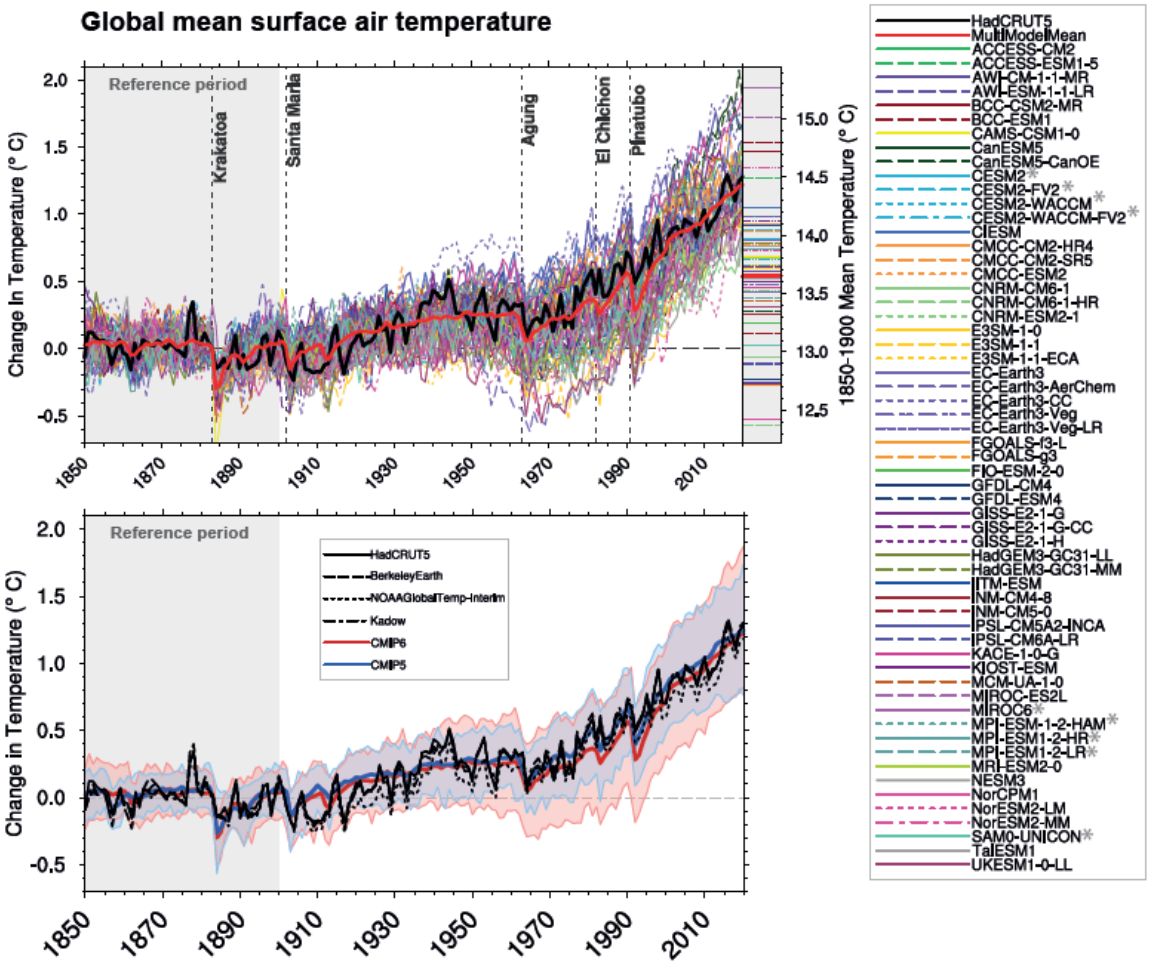

Figure 3.4 | Observed and simulated time series of the anomalies in annual and global mean surface air temperature (GSAT). All anomalies are differences from the 1850–1900 time-mean of each individual time series. The reference period 1850–1900 is indicated by grey shading. **(a)** Single simulations from CMIP6 models (thin lines) and the multi-model mean (thick red line). Observational data (thick black lines) are from the Met Office Hadley Centre/Climatic Research Unit dataset (HadCRUT5), and are blended surface temperature (2 m air temperature over land and sea surface temperature over the ocean). All models have been subsampled using the HadCRUT5 observational data mask. Vertical lines indicate large historical volcanic eruptions. CMIP6 models which are marked with an asterisk are either tuned to reproduce observed warming directly, or indirectly by tuning equilibrium climate sensitivity. Inset: GSAT for each model over the reference period, not masked to any observations. **(b)** Multi-model means of CMIP5 (blue line) and CMIP6 (red line) ensembles and associated 5th to 95th percentile ranges (shaded regions). Observational data are HadCRUT5, Berkeley Earth, National Oceanic and Atmospheric Administration NOAAGlobalTemp-Interim and Kadow et al. (2020). Masking was done as in (a). CMIP6 historical simulations were extended with SSP2-4.5 simulations for the period 2015–2020 and CMIP5 simulations were extended with RCP4.5 simulations for the period 2006–2020. All available ensemble members were used (see Section 3.2). The multi-model means and percentiles were calculated solely from simulations available for the whole time span (1850–2020). Figure is updated from Bock et al. (2020), their Figures 1 and 2. CC BY 4.0 https://creativecommons.org/licenses/by/4.0/. Further details on data sources and processing are available in the chapter data table (Table 3.SM.1).

IPCC Physical Science AR6, *supra* note 7, at 435.

Tropospheric warming and stratospheric cooling. The CWG Report asserts that models have predicted too much warming in the troposphere and too much cooling in the stratosphere. CWG Report at 34–38. The Report cites Benjamin Santer's work to support the Report's claims on stratospheric cooling. Santer has stated that the CWG Report "completely misrepresents my

work."[228] While his research does not show the re-emergence of a cooling trend within the lower stratosphere, Santer *et al.* (2023)'s[229] analysis of the upper stratosphere produces a more distinct view of the "fingerprint" of anthropogenic climate change, which the CWG Report ignores. Santer *et al.* (2023) concludes that the "fingerprint" is undoubtable, even if the lower stratosphere, in isolation, does not show significant cooling due to the additional influence of ozone depletion and recovery.[230]

U.S. Corn Belt. The CWG Report asserts that for the U.S. Corn Belt, the CMIP6 models used by the IPCC "warm far too rapidly compared to observations." CWG Report at 42. The Report bases this observation on global climate models (within the CMIP6 ensemble). But those climate models are not intended to be used for smaller-scale regional predictions due to the complex systems and randomness of regional weather and climate patterns such as lake effects[231] and the intensive agriculture practices and productivity in the Corn Belt.[232]

The CWG Report itself acknowledges that "users need to assess model projections carefully on a case-by-case basis since local biases might be sufficiently large that the models are simply not fit for purpose." CWG Report at 43.[233] This point is in direct conflict with the CWG Report's critique that the models shown in Figure 5.9, which are *global* climate models, are inaccurate as to a relatively small area of the United States. *See* CWG Report at 43. There are, however, models designed to look at the resolution of the Corn Belt, such as The Weather Research and Forecasting (WRF) model,[234] which can produce much more accurate projections for this scale but which the CWG Report ignored. Furthermore, the CWG Report fails to provide any justification for the models used in the figure and the ones omitted (such as CanESM5/r1i1p1f1). *See* CWG Report at 43.

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[228] Andrew Zinin, *US Energy Department Misrepresents Climate Science in New Report*, Sci. X: Phys.org (Aug. 1, 2025), https://perma.cc/Q8PP-6W9Z.

[229] Benjamin D. Santer et al., *Exceptional Stratospheric Contribution to Human Fingerprints on Atmospheric Temperature*, 120 (20: e2300758120) *Proc. Natl. Acad. Scis*. (May 8, 2023), https://perma.cc/R576-J836.

[230] *Id.*

[231] Laura J. Briley et al., Large Lakes in Climate Models: A Great Lakes Case Study on the Usability of CMIP5, 47 (2) J. Great Lakes Rsch. 405-418 (Apr. 2021), https://perma.cc/UN3G-CMCT.

[232] N.D. Mueller et al., *Cooling of US Midwest summer temperature extremes from cropland intensification*, 6(3) Nature Climate Change 317–322 (2016), https://perma.cc/2528-6ZBV.

[233] *See also* Tim Palmer & Bjorn Stevens, *The Scientific Challenge of Understanding and Estimating Climate Change*, 116 (49) *Proc. Nat'l Acad. Scis.,* 24390–24395 (Dec. 3, 2019), https://perma.cc/7RDE-BJSS.

[234] Zhe Zhang et al., *US Corn Belt Enhances Regional Precipitation Recycling*, 122 (1: e2402656121) *Proc. Natl. Acad. Sci.* (Dec. 30, 2024), https://perma.cc/94QG-FTDL.

Finally, the CWG Report remarks that "the anticipated negative effects of increasing temperatures on U.S. corn yields have not materialized." *Id.* What the CWG Report fails to acknowledge is that yields of corn are dependent on more than just temperature conditions; they also depend heavily on inputs such as irrigation,[235] fertilization,[236] and the use of pesticides and herbicides.[237] Yields are predicted to start to decrease due to the impacts of climate change in many locations,[238] and at some point, technological fixes will not be enough to stop it.[239]

v. Extreme Weather

The CWG Report asserts that "[m]ost types of extreme weather exhibit no statistically significant long-term trends over the available historical record." CWG Report at 46. This conclusion misstates the evidence and ignores the well-supported scientific consensus that extreme weather is becoming more severe and more frequent because of human-caused climate change.

Temperature and Heat Waves. The CWG Report argues that temperatures in the U.S. have become less extreme over time and that heatwaves are not increasing due to human-caused greenhouse gas emissions. *See* CWG Report at 52–60. Further, the report asserts, "[w]hile there has been an increase in hot days in the U.S. since the 1950s, . . . numbers are still low relative to the 1920s and 1930s." CWG Report at 46.

These points are erroneous and misleading. As explained in AR6, "[i]t is *virtually certain* that hot extremes (including heatwaves) have become more frequent and more intense across most land regions since the 1950s, while cold extremes (including cold waves) have become less frequent and less severe, with *high confidence* that human-caused climate change is the main driver of these changes."[240] And the Report's reference to relatively high numbers of hot days

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[235] T.J. Troy et al., *The Impact of Climate Extremes and Irrigation on US Crop Yields*, 10 (054013) Env't Rsch. Letters (May 14, 2015), https://perma.cc/SS2N-2LQ2.

[236] Yihenew G. Selassie, *The Effect of N Fertilizer Rates on Agronomic Parameters, Yield Components and Yields of Maize Grown on Alfisols of North-western Ethiopia*, 4 (21) Env't Sys. Rsch. (2015), https://perma.cc/JW8A-LX7N.

[237] *Assessing Yield-Limiting Factors in Corn, When Do Yield Components Develop?,* Crop Observation & Recommendation Network (C.O.R.N.) Newsl. (Ohio State Univ. Coll. of Food, Agric., & Env't Scis./Ohio State Univ. Extension Agronomic Crops Network), 2022, https://perma.cc/9QX8-4UDH.

[238] Jayson Beckman et al., Estimating Market Implications From Corn and Soybean Yields Under Climate Change in the United States, USDA Econ. Rsch. Serv., (Economic Research Report No. 324) (2023), https://perma.cc/UP3G-PR9L.

[239] *Climate Change Cuts Global Crop Yields, Even When Farmers Adapt*, ACES Newsl. (Univ. of Ill. Urbana-Champaign Coll. of Agric., Consumer & Env't Scis), June 18, 2025, https://perma.cc/2VVJ-HWNB.

[240] IPCC Physical Science AR6, *supra* note 7, at 8.

during the 1920s and 1930s is based on outlier data: the hot days of the 1930s were caused by the Dust Bowl, a regional event in which European settlers inappropriately applied temperate ecosystem farming practices in the dryland ecosystem of the Great Plains, at the same time that the region experienced three multi-year periods of drought.[241] Much of the topsoil in the central United States blew away during this period, allowing increased warming from the sun.[242] "[W]eather patterns sometimes pushed the dust and heat all the way to the East Coast."[243] The anomalies of the Dust Bowl do not detract from the strong evidence that heatwaves are increasing due to human-caused climate change.

For its claim that temperatures in the United States are becoming less extreme, the CWG Report relies on data from the United States Historical Climate Network (USHCN), which is comprised of 1,211 weather stations. The CWG Report uses the single year in which a record high or low temperature for any particular calendar day occurred over the time period of the dataset, and finds that more of the hottest or coolest days occurred in the first half of the data set than in the last half. *See* CWG Report at 53–57. In 2014, however, the USHCN was replaced by the nClimDiv data set as NOAA's official temperature data set for the contiguous 48 states and Alaska.[244] The nClimDiv divisional data set incorporates data from more than 10,000 stations and uses a computational approach known as climatologically aided interpolation that helps to address topographic variability.[245] The nClimDiv data set represents a vast improvement in geographical coverage, resolution, and accuracy over the USHCN dataset alone.[246] Moreover, standard, peer-reviewed measures for examining trends in average surface temperature show significant increase. For example, the following figure from EPA shows that the average surface temperature in the contiguous United States has unequivocally increased since 1901, and that average temperatures have risen more quickly since the late 1970s:

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[241] Bob Henson & Jeff Masters, *Why Were the 1930s So Hot in North America?*, Yale Climate Connections Newsl. (Yale Ctr. Env't Educ/Yale Sch. Env't), July 15, 2024, https://perma.cc/3CV3-H3SR; Robert A. McLeman et al., *What We Learned from the Dust Bowl: Lessons in Science, Policy, and Adaptation*, 35 Population & Env't 417-440 (Aug. 28, 2014), https://perma.cc/2BS3-NU62.

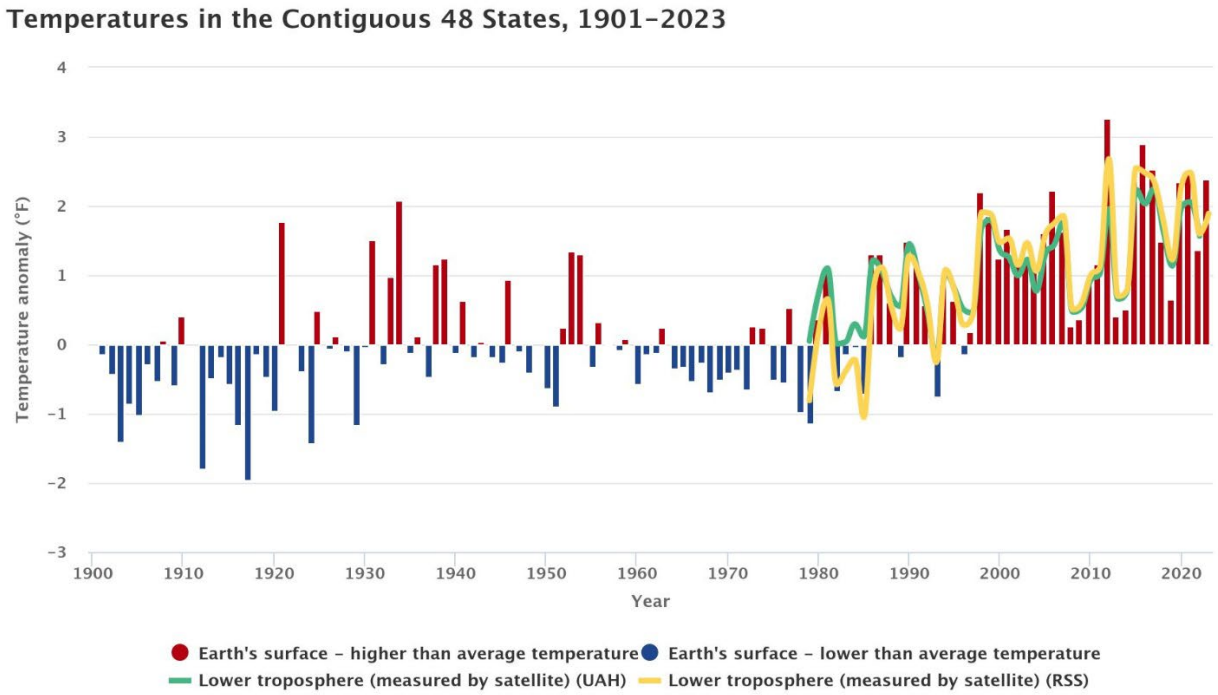
[242] Henson & Masters, *supra* note 241.

[243] *Id.*

[244] EPA, Technical Documentation: U.S. and Global Temperature (June 2024), https://perma.cc/K8WT-2J8V (referenced at EPA, *Climate Change Indicators: U.S. and Global Temperature*, (last updated May 9, 2025), https://perma.cc/Q9EP-4DRL).

[245] *Id.* at 3.

[246] *Id.* at 2–7; *National Temperature Index: Background*, NOAA Nat'l Ctrs. For Env't Info. (archived Aug. 27, 2025), https://perma.cc/KP7S-JZZ6.



EPA, Climate Change Indicators: U.S. and Global Temperature (last updated May 9, 2025), https://perma.cc/Q9EP-4DRL.

The CWG Report relatedly claims that cold is more dangerous than heat, and rising temperatures will therefore save lives. *See* CWG Report at 111–14. This claim is misleading. The CWG Report asserts that "[m]ortality during heat extremes is typically caused by heat stroke and heat exhaustion." CWG Report at 112. In fact, deaths from cardiovascular and respiratory illnesses related to heat are much more common.[247] Further, it is well known that heat-related deaths are severely underreported in coroners' reports, and thus undercounted.[248] And the CWG Report relies heavily on a source, Gasparrini *et al.* (2015),[249] whose conclusions have been

[247] EPA, Climate Indicators Report: Technical Documentation: Heat-Related Deaths, at 8 (June 2024), https://perma.cc/J4B5-ZBP4 (EPA Heat-Related Deaths Report).

[248] *Id.* at 9.

[249] Antonio Gasparrini, et al., *Mortality Risk Attributable to High and Low Ambient Temperature: A Multicountry Observational Study*, 386 (9991) Lancet 369–375 (July 25, 2015), https://perma.cc/A73R-4WZG. Moreover Dr. Gasparrini expresses disagreement with the CWG Report's analysis. *See* Ayesha Tandon et al., *Factcheck: Trump's climate report includes more than 100 false or misleading claims* (Aug. 13, 2025), https://perma.cc/V7DK-EAMX (quoting Dr. Antonio Gasparrini).

called into question.[250] Indeed, data from the National Weather Service and from the U.S. Centers for Disease Control (CDC) show clearly that heat is the leading cause of weather-related mortality in the United States.[251] Further, in emphasizing the counteracting effects of cold versus heat-driving mortality changes, the Report incorrectly implies that climate change is net beneficial for health, which ignores the increases in morbidity and mortality driven by increased exposure to dangerous air pollution, higher disease burdens, extreme weather events, flooding, and other impacts discussed *infra* Section II.

Tropical cyclones. As the CWG Report notes, although "all measures of Atlantic hurricane activity show a significant increase since 1970[,]" there is not strong evidence of long-term trends in the frequency or intensity of tropical cyclones. CWG Report at 48–49. (The CWG Report limits its analysis to hurricanes, while scientists generally discuss a range of tropical convective events called tropical cyclones, which include hurricanes.[252]) But the CWG Report ignores important and strongly supported dangers regarding tropical cyclones and climate change.

For example, there is strong evidence that "human-caused climate change increases heavy precipitation associated with tropical cyclones."[253] Scientists also have a high level of confidence that 1.5°C global warming will cause an "increased proportion of and peak wind speeds of intense tropical cyclones."[254] And tropical cyclones have become slower moving over the past century, resulting in more rain, wind, flooding, and property damage.[255]

The CWG Report also cherry-picks the data to paint an inaccurate picture of mild weather. In Table 6.2.1 and related discussions, the Report analyzes hurricanes that have made landfall with sustained winds greater than 150 mph, CWG Report at 49–52, an arbitrary cut off that has no basis in tropical cyclone science and little relationship to the effects of tropical cyclones on humans.

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[250] Keith Dear & Zhan Wang, *Climate and Health: Mortality Attributable to Heat and Cold*, 386 (9991) Lancet 320 – 322 (July 25, 2015), https://perma.cc/ECY6-788K.

[251] *Weather Related Fatality and Injury Statistics: Weather Fatalities 2024*, NOAA Nat'l Weather Serv. (archived Aug. 31, 2025), https://perma.cc/GBG6-6BTV; *see also 2025 Heat-Related Mortality Report*, N.Y.C. Dep't of Health & Mental Hygiene (archived Aug. 28, 2025), https://perma.cc/E6RR-LC93 (finding "an estimated 525 people died annually due to heat" in New York City).

[252] *See Tropical Cyclone Climatology,* NOAA Nat'l Weather Serv.: Nat'l Hurricane Ctr. & Cent. Pac. Hurricane Ctr. (archived Aug. 31, 2025), https://perma.cc/6ZYZ-W4WM.

[253] IPCC Climate Change 2023 Synthesis Report AR6, *supra* note 24, at 51.

[254] *Id.* at 98.

[255] NCA5, *supra* note 1, at 2-20.

Tornadoes. The CWG Report asserts that "there is a noticeable downward trend in the number of severe tornadoes in the U.S, since 1950." CWG Report at 66. However, that the downward trend since 1950 may be attributable to the change in severity rating in 1973 when the Enhanced Fujita Scale was implemented. Before this, tornadoes were rated by newspaper clippings[256] and were most likely over-rating the severity of storms.[257] The CWG Report also inaccurately states that "tornado strength is measured by the damage it produces." CWG Report at 66. Tornado strength is rated by recorded windspeed *and* expected damage information.[258] The CWG Report fails to account for these factors.

The CWG Report also fails to mention that "Tornado Alley," the geographic area most commonly associated with tornado activity, is moving eastward.[259] The annual number of tornadoes rated moderate or higher has decreased in the western United States by 34% while increasing 60% in the eastern United States.[260] This eastward shift could lead to more fatalities and monetary damages due to higher population density and less wind-resilient infrastructure.[261]

Flooding. The CWG Report asserts there is an "absence of detectable U.S.-wide trends in flooding." CWG Report at 68. This interpretation is based solely on streamflow measurements and disregards the serious threat of flash flooding and sunny-day flooding in coastal areas.

As described by the IPCC, "the seasonality of floods has changed in cold regions where snowmelt dominates the flow regime in response to warming."[262] This shift can cause snow to melt earlier and more quickly in the year, leading to the potential for fluvial and flash flooding events downstream.[263] As average temperatures continue to rise due to climate change, this risk

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[256] Christopher J. Anderson et al., *Population Influences on Tornado Reports in the United States*, 22 (3) Weather & Forecasting 571-579 (June 1, 2007), https://perma.cc/T5E2-88SN.

[257] Timothy A. Coleman et al., *A Comprehensive Analysis of the Spatial and Seasonal Shifts in Tornado Activity in the United States*, 63 (6) J. of Applied Meteorology & Climatology 717–730 (June 1, 2024), https://perma.cc/KJ7A-WKNX.

[258] *Explanation of EF-Scale Ratings,* NOAA Nat'l Weather Serv. Huntsville, Ala. Weather Forecast Off. (archived Aug. 31, 2025), https://perma.cc/S66V-URT5.

[259] Todd W. Moore & Tiffany A. DeBoer, *A Review and Analysis of Possible Changes to the Climatology of Tornadoes in the United States*, 43 (3) Progress Physical Geography: Earth & Env't, 365–390 (Feb. 25, 2019), https://doi.org/10.1177/0309133319829398 (attached as Exhibit GG).

[260] Coleman et al., *supra* note 257, at 726.

[261] James B. Elsner et al., *A Model for U.S. Tornado Casualties Involving Interaction between Damage Path Estimates of Population Density and Energy Dissipation*, 57 (9) J. Applied Meteorology & Climatology 2035–2046 (Sept. 1, 2018), https://perma.cc/P6NZ-8SRD.

[262] IPCC Physical Science AR6, *supra* note 7, at 1568.

[263] Manuela Nied et al., *On the Relationship Between Hydro-Meteorological Patterns and Flood Types*, 519 (D) J. Hydrology 3249-3262 (Nov. 2014), https://www.*sciencedirect*.com/science/article/pii/S0022169414008233 (attached as Exhibit HH).

will also continue to grow. And "robust evidence [shows] that human-caused warming has contributed to increases in the frequency and severity of the heaviest precipitation events across nearly 70% of the US."[264]

Similarly, with rising sea levels caused by climate change, coastal communities continue to see more instances of sunny day flooding, which occurs due to high tides rather than precipitation events.[265] "Since 1990, high tide flooding has nearly tripled . . . due to sea level rise caused by climate change and sinking land."[266] This type of flooding requires infrastructure upgrades that can be prohibitively expensive and expose vulnerable communities to dangerous conditions, such as mold growth from persistent moisture.[267]

Droughts. Droughts are generally categorized as meteorological droughts (caused by lack of precipitation), agricultural and ecological droughts (caused by soil moisture deficits), or hydrological droughts (involving water deficits in waterbodies).[268] The CWG Report focuses narrowly on meteorological droughts, summarily asserting "there is no evidence of increasing *meteorological* drought frequency or intensity in the U.S. or globally over recent decades." CWG Report at 69 (emphasis added).

In contrast, the IPCC's AR6 describes that "[t]rends in precipitation are not a main driver in affecting global-scale trends in drought."[269] Rather, "there is *high confidence* that [agricultural and ecological droughts have] increased on average on continents, contributing to increased [evapotranspiration] and resulting water stress during periods with precipitation deficits, in particular during dry seasons."[270]

Moreover, the sole chart in this section depicts the monthly percent of the United States classified as "very dry" from 1895 to 2025. *See* CWG Report at 68. This analysis is inapt for two reasons. First, it is based solely on precipitation data and says nothing about non-meteorological droughts. Second, it groups the entire United States together, thus ignoring regional trends.

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[264] NCA5, *supra* note 1, at 2-18.

[265] *The State of High Tide Flooding and 2022 Outlook*, NOAA Ctr. for Operational Oceanographic Prods. & Servs: NOAA Tides & Currents (archived Aug. 31, 2025), https://perma.cc/YXY5-3Z9B.

[266] *Flooding on a Sunny Day? Here's How (1-Minute Watch)*, NOAA Ocean Today (last visited Aug. 29, 2025), https://oceantoday.noaa.gov/flooding-sunny-day/.

[267] *Chronic Tidal Flooding*, N.Y.C. Mayor's Off. of Climate & Env't Just. (archived Aug. 31, 2025), https://perma.cc/3B3N-VSFU.

[268] IPCC Physical Science AR6, *supra* note 7, Annex VII: Glossary, definitions of "Drought," at 2226.

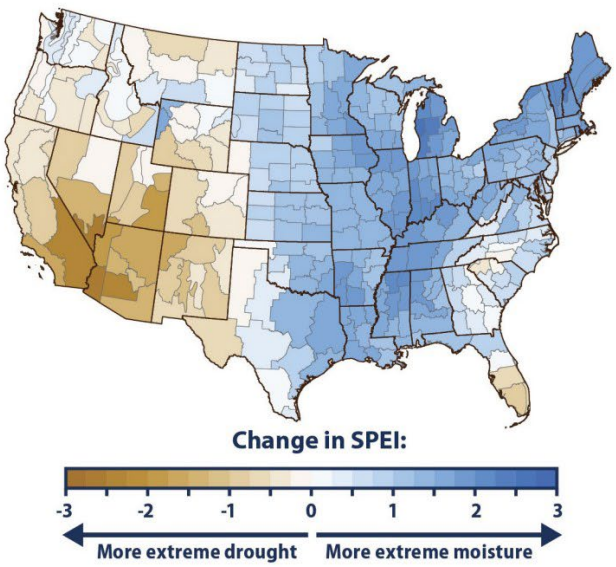
[269] IPCC Physical Science AR6, *supra* note 7, at 1518.

[270] IPCC Physical Science AR6, *supra* note 7, at 1575 (emphasis in original).

A more robust analysis can easily avoid these pitfalls. The following figure from EPA's Climate Change Indicators in the United States: Fifth Edition, accounts for both precipitation and evapotranspiration on a regional level, and demonstrates a significant increase in drought conditions in western United States since 1900:

Figure 15. Average Change in Drought (Five-Year SPEI) in the Contiguous 48 States, 1900–2023

This map shows the total change in drought conditions across the contiguous 48 states, based on the long-term average rate of change in the five-year Standardized Precipitation Evapotranspiration Index (SPEI) from 1900 to 2023. SPEI measures the combination of water supply (precipitation) and atmospheric water demand (evapotranspiration, which is based on temperature) to determine whether a certain area is experiencing extreme drought, extreme moisture, or conditions in between. Data are displayed for small regions called climate divisions. Blue areas represent increased moisture; brown areas represent decreased moisture or drier conditions. Data sources: Abatzoglou et al., 2017;[5] Western Regional Climate Center, 2024.[6]



EPA, Climate change indicators in the United States (Fifth ed., EPA 430-R-24-003), at 28 (July 2024), https://perma.cc/4ZDE-HH2V.

This figure also shows that while drought has increased in some U.S. regions, extreme moisture has increased in others, demonstrating that drought trends are region-specific. Therefore, considering the entirety of the U.S. in the "monthly percent classified as very dry" does not make sense. Rather, any drought trend analysis should reflect the region-specific nature of moisture and drought trends in the U.S.

Finally, the CWG Report references Kogan et al. (2020) to assert there has been no observable increase in drought frequency or intensity and to dispute a connection between global drought and climate change. CWG Report at 69. This article's utility may be limited by the fact that it uses a vegetative-health-based metric to measure drought rather than the frequency and tendency of drought conditions.[271]

Wildfires. The CWG Report first states that the area burned by wildfires has been decreasing globally. The CWG Report's presentation of these facts is misleading and lacking in

[271] Felix Kogan et al., *Near 40-Year Drought Trend During 1981-2019 Earth Warming and Food Security*, 11 (1) Geomatics, Nat. Hazards & Risk 469-490 (Feb. 26, 2020), https://perma.cc/7PPW-C5H7.

context. The Report relies on data on annual average burned area across the globe. CWG Report at 69, Figure 6.8.1. Analyzing burned area in the global aggregate excludes extreme fires, which pose the greatest risks to society. According to Cunningham et al., (2024), which is referenced in the CWG Report:

> [A]s most fires are human ignited and have relatively small impacts, a focus on average intensities and global burned area mean that such analyses are swamped by relatively low-impact fires, including fire used for habitat management, pastoralism, agriculture, and silviculture. A focus on global averages disproportionately weights Africa (67% of burned land) and conceals opposing trends in different regions. Importantly, a focus on average intensities obscures the extreme events—those that cause the most damage and release the most emissions.
>
> …
>
> Our results show that events of extreme intensity have more than doubled in frequency and magnitude, with increases largely concentrated in the carbon-rich boreal and temperate conifer forest of the northern hemisphere.[272]

The CWG Report also asserts that global wildfire coverage is "constant or declining on every continent," citing Samborska and Ritchie (2024). But this reference clarifies that the difference between vegetative biomes must be considered, as "most of this decline has come from shrublands, grasslands, and croplands (with small declines in savannas). Forest fires have been relatively stable."[273] Indeed, another study cited by the CWG Report finds "an increasing global trend in forest loss due to fire from 2001 to 2019, driven by near-uniform increases across the tropics, subtropical, and temperate Australia, and boreal Eurasia[,]" which "quantif[ies] the increasing threat of fires to remaining forests globally."[274]

Lastly, in its analysis of U.S. data on wildfires, the CWG Report acknowledges that National Interagency Fire Center data from before 1960 is unreliable, but nonetheless includes that data in Figure 6.8.3, which skews the apparent trend in U.S. wildfire area. CWG Report at 71. In contrast, the EPA Climate Change Indicators in the United States: Fifth Edition report correctly excludes pre-1960 data from its graph:

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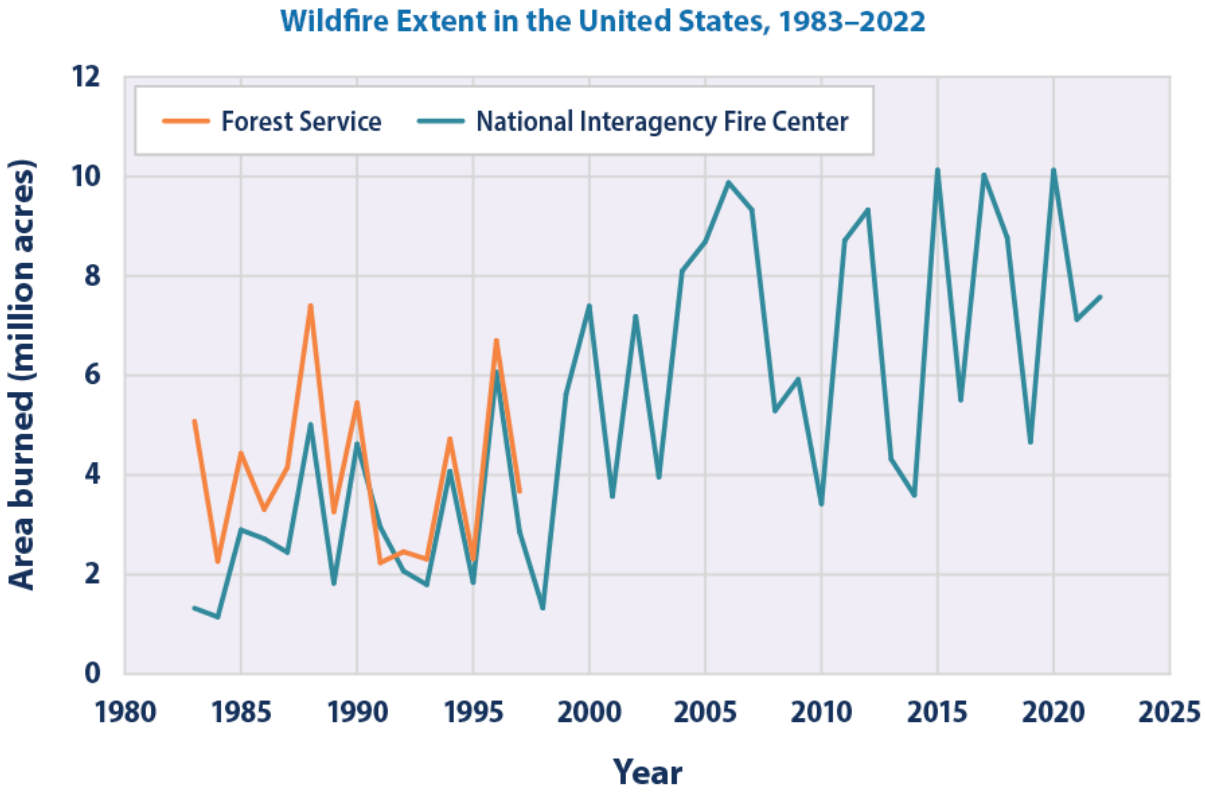
[272] Calum X. Cunningham et al., *Increasing Frequency and Intensity of the Most Extreme Wildfires on Earth*, 8 (8) Nature Ecology & Evolution 1420–1425 (June 24, 2024), https://doi.org/10.1038/s41559-024-02452-2 (internal citations omitted) (attached as Exhibit II).

[273] Veronika Samborska & Hannah Ritchie, *Wildfires*, Our World in Data (Apr. 2, 2024; updated weekly), https://perma.cc/EW93-NRLY.

[274] Alexandra Tyukavina et al., *Global Trends of Forest Loss Due to Fire from 2001 to 2019*, 3 (825190) Frontiers Remote Sensing 1, 1 (Mar. 14, 2022), https://perma.cc/8SJ7-438G.



Data sources:
- NIFC (National Interagency Fire Center). (2024). *Total wildland fires and acres (1983–2023).* [Data set]. Retrieved February 21, 2024, from www.nifc.gov/fireInfo/fireInfo_stats_totalFires.html
- Short, K. C. (2015). Sources and implications of bias and uncertainty in a century of US wildfire activity data. *International Journal of Wildland Fire, 24*(7), 883–891. https://doi.org/10.1071/WF14190

For more information, visit U.S. EPA's "Climate Change Indicators in the United States" at www.epa.gov/climate-indicators.

EPA, Climate change indicators in the United States (Fifth ed., EPA 430-R-24-003) (2024), www.epa.gov/climate-indicators.

When plotted correctly, it is evident that area burned by wildfires in the U.S. has been increasing since 1985, including after 2007. The fact that the number of fires has not increased over this period (as noted by the CWG Report), but burned area has, demonstrates that fires in the United States are becoming more extreme.

This rise in extreme weather events fits the pattern one expects with a warming planet, where average temperatures are increasing and the atmosphere holds more moisture. Scientists project that climate change will make some of these extreme weather events more likely to occur and/or more likely to be severe.[275]

[275] EPA, Climate Change Indicators in the United States (EPA 430-R-24-003) 26 (5th ed. July 2024), https://perma.cc/4ZDE-HH2V.

In sum, the CWG's critiques of climate science are based on incomplete analyses and flawed interpretations of the literature. These critiques do not undermine the scientific consensus that human-induced climate change is causing widespread harm to humans, which will dramatically worsen without rapid emissions reductions.[276]

2. The CWG Report's economic analysis and policy commentary, including its assessment of the social cost of carbon, are unfounded and flawed.

The CWG Report's discussion of climate change, the economy, and the social cost of carbon fails to accurately reflect available research (including the research it cites) and fails to undermine the extensive evidence of social costs already caused by climate change and of the much greater costs that will be caused by unabated greenhouse gas emissions.

The Report asserts that "[s]tudies that take full account of modeling uncertainties either find no evidence of a negative effect on global growth from CO_2 emissions or find poor countries as likely to benefit from it as rich countries." CWG Report at 116, 120. For this sweeping conclusion, the CWG Report cites only *a single study*, which finds precisely the opposite. The study concluded that "the central estimate of the economic impact of global warming is always negative"; "[t]he uncertainty about the impact is skewed towards negative surprises"; and "[p]oorer countries are much more vulnerable than richer ones."[277] Indeed, after the CWG

[276] The CWG Report relatedly takes issue with the attribution of extreme weather events to anthropogenic climate change. CWG Report at 95. As the IPCC concludes, however:

> It is an established fact that human-induced greenhouse gas emissions have led to an increased frequency and/or intensity of some weather and climate extremes since pre-industrial time, in particular for temperature extremes. Evidence of observed changes in extremes and their attribution to human influence (including greenhouse gas and aerosol emissions and landuse changes) has strengthened since AR5, in particular for extreme precipitation, droughts, tropical cyclones and compound extremes (including dry/hot events and fire weather).

IPCC Physical Science AR6, *supra* note 7, at 1517; *see also* NCA5, *supra* note 1, at 2-16 (similar). The CWG Report at 95 contends that Table 12.12 of IPCC Physical Science AR6 conflicts with those conclusions, but Table 12.12 in fact concludes with high and medium confidence that various increases in extreme weather have already occurred and that many more would occur under high-emissions scenarios. *Id.* at 1856, Table 12.12.

[277] *See* Richard S. J. Tol, *A Meta-Analysis of the Total Economic Impact of Climate Change,* 185 (113922) Energy Policy 1, 1 (Feb. 2024), https://perma.cc/84VL-H699.

Report was released, Richard Tol, the author of that study, wrote that the CWG misrepresented his conclusions and generally failed to conduct a robust review of the relevant research.[278]

As another example, the CWG Report cites a 2023 study for the theory that rising temperatures could be economically beneficial because the negative effects of extreme cold events are greater than those of extreme heat events. CWG Report at 117. But this study finds that their results "provide evidence for the damage that climate change causes in the US using various economic indicators."[279] As a final example, the CWG Report argues that social cost of carbon calculations are flawed because they do not account for the private benefit of fossil fuel usage. CWG Report at 123. For this point, the Report relies on a 2017 paper by Richard Tol, who points out that his paper was correctly rejected during peer review and therefore never published in a peer-reviewed journal because its methodology was "wrong."[280]

As the CWG Report indicates, some climate change effects are beneficial rather than detrimental. *See* CWG Report Chapters 2, 9, and 10. "Cold regions may benefit from low levels of warming[281] while temperate and hot regions are generally harmed."[282] But the benefits of warming are grossly overstated in the Report, and the Report fails to acknowledge the critical point that the detrimental effects are much greater in number, scale, and severity—presumably because the Report entirely fails to discuss or grapple with any of the deleterious effects of climate change. Indeed, in most areas researchers have examined, "more Americans are harmed

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[278] Richard Tol, *Is Climate Change Dangerous?*, Substack: Tol Tales (July 30, 2025), https://perma.cc/7V46-GFAF ("I am cited 3 times, incorrectly all three times. . . . Tol (2024) finds that the then available studies jointly point to a negative impact of climate change on global economic growth. . . . Their conclusion that "poor countries" are "likely to benefit" is again not backed up with references. Tol (2024), the only reference in the paragraph, concludes the opposite. . . . The [social cost of carbon] literature is vast. I counted 446 papers with estimates. There are numerous commentaries; and two handfuls of meta-analyses (e.g. Tol (2023) and Moore et al. (2024)). Instead, the authors wrote their own review, which omits the most influential papers and misses key insights. Cherry-picking may be a better term than review.").

[279] Kamiar Mohaddes et al., *Climate Change and Economic Activity: Evidence from US States*, 2 (odac010) Oxford Open Economics (2023), https://perma.cc/KKF7-GCYJ; *see also* Tandon et al., *supra* note 249 (quoting Dr. Kamiar Mohaddes).

[280] Tol, *supra* note 278.

[281] For example, rising temperatures are expected to reduce cold-related mortality while increasing heat-related mortality. A recent study of these countervailing effects for European cities found that increases in heat-related mortality are projected to dominate decreases in cold-related mortality, with the effect most pronounced for higher global warming and lower adaptation levels. In scenarios where greenhouse gas emissions are aggressively mitigated and adaptation is very robust, temperature-related mortality can be reduced. Pierre Masselot et al., *Estimating Future Heat-Related and Cold-Related Mortality Under Climate Change, Demographic and Adaptation Scenarios in 854 European Cities,* 31 Nature Medicine 1294–1302 (Jan. 27, 2025), https://perma.cc/G5N9-68QT.

[282] NCA5, *supra* note 1, at 19-6 (citation omitted).

than are helped by climate change."[283] As noted above, "estimates of nationwide impacts indicate a net loss in the economic well-being of American society."[284]

The CWG Report's discussion of the social cost of greenhouse gas emissions largely ignores EPA's peer-reviewed methodology for monetizing the harm caused by these emissions.[285] The U.S. government has been monetizing costs and benefits since the 1920s, and has been doing so consistently across the entire federal government since 1981.[286] In 2010, the federal government developed a social cost of carbon for use in monetizing the net damages caused by greenhouse gas emissions using an interagency group of experts and relying on state-of-the-art models from the peer-reviewed literature.[287] The history of this process is laid out in more detail in EPA's Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances (2023 EPA Report).[288] The values have been updated at numerous points since 2010 to incorporate advances in science and economics, and have been peer-reviewed, routinely subject to public comment, reviewed by the U.S. Government Accountability Office,[289] and comprehensively evaluated by the National Academies of Science, Engineering, and Medicine in 2016 and 2017.[290] And during every previous administration since the Clinton administration, including the first Trump administration, DOE correctly concluded that the costs

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[283] NCA5, *supra* note 1, at 19-6, 19-10 (Figure 19.1b).

[284] NCA5, *supra* note 1, at 19-6 (citing S. Hsiang et al., *supra* note 47; A. Rode, et al. (2021), *supra* note 47; A. Rode et al. (2019), *supra* note 47; A. Hultgren et al., *supra* note 47; T. Carleton et al., *supra* note 47; J. Martinich & A. Crimmins, *supra* note 47.); *see also id.* at 19-20 ("Most of the [cited] papers find an asymmetric relationship with regard to temperature, where being too hot is worse than being too cold. Hence, the effect of an increase in extreme heat is the dominant driver for most places in the US leading to a net [economic] loss.").

[285] EPA, Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances, Supplementary Material for the Regulatory Impact Analysis for the Final Rulemaking, "Standards of Performance for New, Reconstructed, and Modified Sources and Emissions Guidelines for Existing Sources: Oil and Natural Gas Sector Climate Review" 6–9 (Nov. 2023), https://perma.cc/DK5F-YYMQ (2023 EPA Report).

[286] Joseph Persky, *Cost-Benefit Analysis and the Classical Creed*, 15 (4) J. Econ. Persps. 200–01 (2001), https://perma.cc/8J4J-2JHK; Exec. Order No. 12,291, 46 Fed. Reg. 13,193 (Feb. 19, 1981).

[287] U.S. Gov't Interagency Working Grp. on the Social Cost of Greenhouse Gases, Technical Support Document: Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis Under Exec. Order 12866 (Aug. 2016), https://perma.cc/XU7X-HAKT.

[288] 2023 EPA Report, *supra* note 285, at 5–19.

[289] 2023 EPA Report, *supra* note 285, at 8.

[290] *Id*. at 8-10.

of climate change should be factored into its decision-making.[291] As DOE explained quite simply in 2000, "reductions in CO_2 . . . are a positive benefit to the nation."[292]

Unlike the CWG Report, the 2023 EPA Report integrates the latest updates in scientific knowledge and economics.[293] It produces a social cost of carbon central estimate of $140, $230, and $390/metric ton for 2030 emissions using near-term discount rates of 2.5%, 2.0%, and 1.5%, respectively.[294] The 2023 EPA Report was subject to a robust peer review,[295] and it explains, in expansive detail, the techniques deployed to quantify and address uncertainty and ensure that the estimates are uncertainty weighted.[296] The approach in the 2023 EPA Report—identifying sources of uncertainty and applying techniques like Monte Carlo analysis—is rigorous and up-to-date.[297] The 2023 EPA Report's estimates are consistent with other estimates in the peer-reviewed literature derived using alternate methodologies,[298] and it responds to and implements

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[291] *See, e.g.*, Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters, 66 Fed. Reg. 4474, 4491 (Jan. 17, 2001); Energy Conservation Program for Commercial and Industrial Equipment: Packaged Terminal Air Conditioner and Packaged Terminal Heat Pump Energy Conservation Standards, 73 Fed. Reg. 58,772, 58,813–14. (Oct. 7, 2008); Energy Conservation Program for Certain Industrial Equipment: Energy Conservation Standards and Test Procedures for Commercial Heating, Air-Conditioning, and Water-Heating Equipment, 74 Fed. Reg. 36,312, 36,333, 36,342–43 (July 22, 2009); Energy Conservation Program: Energy Conservation Standards for Walk-In Cooler and Freezer Refrigeration Systems, 82 Fed. Reg. 31,808, 31,853–57 (July 10, 2017); Energy Conservation Program: Energy Conservation Standards for Uninterruptible Power Supplies, 85 Fed. Reg. 1447, 1477–480 (Jan. 10, 2020); Energy Conservation Program: Definitions for General Service Lamps, 87 Fed. Reg. 27,461, 27,474–77 (May 9, 2022).

[292] Energy Conservation Program for Consumer Products: Energy Conservation Standards for Water Heaters, 65 Fed. Reg. 25,042, 25,078 (Apr. 28, 2000).

[293] 2023 EPA Report, *supra* note 285, at 1–2, 24–25, 35–36, 47–53, 55–59, 64, 67–68.

[294] 2023 EPA Report, *supra* note 285, at 1–2, 20–21, 24–25, 35–36, 47–53, 55–59, 64, 67–68, 78, 101, 106.

[295] *Id*. at 10 ("The report represents a huge advance in estimating the US Social Cost of Carbon (SCC). The estimates reported have successfully incorporated all of the short-term recommendations of the National Research Council (NRC) Committee on Valuing Climate Damages, and some of the longer-term recommendations. The report represents the state-of-the-art in executing the four steps of SCC calculation."); *see also* Press Release, EPA, EPA Releases Responses to External Peer Review Comments on "Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances" (Dec. 2, 2023), https://perma.cc/9LP2-2GNT.

[296] 2023 EPA Report, *supra* note 285, at 2, 20–21, 26, 61, 64–65, 67–68, 77–79, 80, 85, 168–70.

[297] *Id*. at 2, 20, 61, 77, 80. Using Monte Carlo techniques, the models were run ten thousand times drawing input values from probability distribution functions that reflect the uncertainty associated with those values to characterize uncertainty and develop estimates that are informed by that uncertainty.

[298] *Id*. at 102–03. Estimates in the 2023 EPA Report are comparable in magnitude to other recent social cost of carbon estimates developed using large expert surveys ($200 per metric ton) and vehicle choice experiments of willingness to pay ($236 per metric ton CO_2; $130-$372 per metric ton CO_2). *See also id*.

the recommendations of the National Academies of Sciences, after a comprehensive review of the prior federal estimates.[299]

The 2023 EPA Report values are also informed, to the extent feasible based on the underlying research, by projections of adaptation and adaptation costs.[300] EPA notes that although the estimates have improved accounting of adaptation and its costs, there are opportunities for future improvements. For example, "the modeled estimates employ optimistic assumptions about adaptation decisions in the estimation of coastal damages [assuming] perfect foresight about [sea level rise] conditions [and that decision makers] always choose the lowest-cost adaptation strategy and level of investment. . . . Recent studies have also highlighted that observed levels of investment in adaptative measures are significantly lower than what is predicted under optimistic cost-minimizing assumptions. . . . [C]urrent [U.S.] adaptation policy tends to be implemented reactively, post-disaster."[301]

In contrast to those robust, well-established methodologies and values, the CWG Report's scant discussion of social cost of carbon estimates—which makes the wholly unremarkable points that any estimates are only as robust as the underlying data and analysis upon which they are based, and that projecting into the future involves significant uncertainty—provides no reasonable justification for abandoning the 2023 EPA Report estimates. *See* CWG Report at 116, 121–22. The CWG Report focuses almost exclusively on two social cost of climate change models (FUND and DICE), *see* CWG Report at 120–23, that were not relied upon in the 2023 EPA Report, and are therefore irrelevant to any critique of that report.[302] The CWG Report also concedes that "[t]here are potential abrupt change points in the climate system in response to warming," but claims that "[w]hen these have been considered, the result is only a modest increase in the SCC value in the 21st century." CWG Report at 125. This assertion is belied by the very study cited, which found that incorporating the risk of eight potential tipping points (a subset of all known and unknown potential tipping points) into a social cost of carbon estimate increased the estimate by 24.5%.[303]

The CWG Report makes one allegation relevant to the 2023 EPA Report, citing a 2025 publication that calls into question the 2023 EPA Report's reliance on a prior publication assessing the net effects of climate change (including warming and CO_2 fertilization) on

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at 98 (discussing total-economy approach, capturing only market effects and deriving a $48 social cost per metric ton of CO_2 estimate).

[299] *Id*. at 1–2, 22–23, 36, 52–53, 55, 106.

[300] *Id.* at 48–55.

[301] *Id.* at 84.

[302] *Id.* at 2, 45–56.

[303] *Id*. at 82 (citing Simon Dietz et al., *Economic Impacts of Tipping Points in the Climate System*, 118 (34: e2103081118) Proc. of the Nat'l Acad. of Scis. (Aug. 16, 2021), https://perma.cc/DVE8-LDHT).

agriculture. *See* CWG Report at 122–23.[304] The 2025 publication concludes that a reanalysis of data indicates that "[t]he negative temperature effects are fully offset by gains from CO_2 fertilization and adaptation" leading to "insignificant but positive average output gains for all crop types."[305] Even if this single study holds up, it would suggest that the agricultural category should be removed from the social cost estimate, as it would not lead to significant monetizable harms or benefits, but would leave the other inputs of the social cost estimate in place. This would result in a social cost of greenhouse gas estimate of $194/ton CO_2[306]—a reduction (16%) from the $230/ton estimate, but certainly not a reduction that undermines the calculation of very large monetizable damages caused by climate change. It seems unlikely that this study will hold up, however. First, it reinterprets one dataset used in Moore (2017) but ignores the second,[307] which also indicated net climate change damages to agriculture. Second, a much larger body of research on crop yield response to climate change is now available, including a new dataset with more than 8,700 point estimates of changes in crop yield across varying temperature, precipitation, CO_2 and other factors[308] (as compared to 1,010 observations in the dataset evaluated in Moore (2017)[309] and 1,222 in McKitrick (2025)[310]). A meta-analysis of that dataset found net declines in global yields for major crops (with the exception of soybeans) even under aggressive emission mitigation scenarios; without aggressive mitigation the analysis found much larger declines across corn, rice, soybeans, and wheat.[311]

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[304] Citing Frances C. Moore et al., *New Science of Climate Change Impacts on Agriculture Implies Higher Social Cost of Carbon*, 8 (1607) Nature Commc'ns (Nov. 20, 2017), https://perma.cc/BP4X-M3ZZ (Moore 2017) and Ross McKitrick, *Extended Crop Yield Meta-analysis Data Do Not Support Upward SCC Revision*, 15 (5575) Nature Sci. Res. (Feb. 15, 2025), https://perma.cc/GV7Q-P3Z6 (McKitrick 2025).

[305] McKitrick 2025, *supra* note 304, at 5.

[306] Taking numbers from Table 3.1.4 in the 2023 EPA Report, *supra* note 285, at 81, zeroing out the "Agriculture" row, and recalculating the 3 sums and then averaging them, as EPA did previously to derive a central estimate, results in ($233 - 4 = $229) + ($219 - 103 = 116) + (238) / 3 = $194/ton CO2 as compared to EPA's original value of $230/ton CO2.

[307] Moore 2017, *supra* note 304, at 3–5.

[308] Toshihiro Hasegawa et al., *A Global Dataset for the Projected Impacts of Climate Change on Four Major Crops,* 9 (58) Nature Sci. Data at 1–11 (Feb. 16, 2022), https://perma.cc/MWA7-DV22.

[309] Moore 2017, *supra* note 304, at 6.

[310] McKitrick 2025, *supra* note 304, at 1.

[311] Christine Li et al., *Predicting Changes in Agricultural Yields Under Climate Change Scenarios and Their Implications for Global Food Security,* 15 (2858) Sci. Reps. 1, 10 (Jan. 22, 2025), https://perma.cc/S4FE-8G9G. Additional peer-reviewed publications support the finding that climate change will lead to yield declines in most parts of the world. *See* Tongxi Hu et al., *Climate Change Impacts on Crop Yields: A Review of Empirical Findings, Statistical Crop Models, and Machine Learning Methods,* 179 (106119) Env't Modelling & Software (Aug. 2024),

Furthermore, the probability distributions for the 2023 estimates themselves show a very significant risk that the "actual" social cost of greenhouse gas emissions is much higher than the central estimate.[312] In other words, high-end estimates with a 5% or 10% likelihood of being "correct" are dramatically higher than the central estimate, while the low-end social cost of greenhouse gas values with a 5% or 10% likelihood of being "correct" are much closer to the central estimate. The significant risk that the "actual" damage number is significantly higher than the central estimate, the fact that these estimates are underestimates (omitting many damage categories entirely and covering many more categories only partially), and the fact that estimates of the social cost of greenhouse gas have been increasing over time as data and methodologies have improved[313] indicate that decision makers should carefully weigh the potential for social damages that are much higher than the central social cost of greenhouse gas estimates. DOE has altogether failed to do so here, warranting withdrawal of the CWG Report.

3. The CWG Report's scientific findings warrant no deference.

Secretary Wright commissioned the CWG Report for the purposes of informing "energy policymaking." CWG Report at x. Indeed, the timing and use of the Report show that it was intended to support EPA's proposed rescission of the 2009 Endangerment Finding. The Report, however, is unsuitable for governmental policymaking and warrants no deference.

DOE is not the primary agency charged with researching and addressing environmental issues. Rather, DOE was created, inter alia, "[t]o carry out the planning, coordination, support, and management of a balanced and comprehensive *energy* research and development program[,]" and "place major emphasis on the development and commercial use of solar, geothermal, recycling and other technologies utilizing renewable energy resources." 42 U.S.C. § 7112(5), (6). In contrast, EPA was created, inter alia, to "conduct . . . research on the adverse effects of pollution and on methods and equipment for controlling it, the gathering of

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https://doi.org/10.1016/j.envsoft.2024.106119 (attached as Exhibit JJ); Andrew Hultgren et al., *Impacts of Climate Change on Global Agriculture Accounting for Adaptation*, 642 Nature 644–652 (June 18, 2025), https://perma.cc/9BY7-UVAB; Jonas Jägermeyr et al., *Climate Impacts on Global Agriculture Emerge Earlier in New Generation of Climate and Crop Models,* 2 Nature Food 873–885 (Nov. 1, 2021), https://doi.org/10.1038/s43016-021-00400-y (attached as Exhibit KK); Chuang Zhao et al., *Temperature Increase Reduces Global Yields of Major Crops in Four Independent Estimates*, 114 (35) Proc. Nat'l Acad. Scis. 9326–9331 (Aug. 15, 2017), https://perma.cc/6P74-SG7H; Peng Zhu et al., *Warming Reduces Global Agricultural Production by Decreasing Cropping Frequency and Yields,* 12 Nature Climate Change 1016–1023, 1016, 1021–22 (Oct. 10, 2022), https://www.nature.com/articles/s41558-022-01492-5 (excerpt attached as Exhibit LL; cannot attach full document due to file size limitations); Chunwu Zhu et al., supra note 182; E. Marie Muehe et al., *Rice Production Threatened by Coupled Stresses of Climate and Soil Arsenic,* 10 (4985) Nature Commc'ns (Nov. 1, 2019), https://perma.cc/YY7D-UP3T.

[312] 2023 EPA Report, *supra* note 285, at 80 (Figure 3.1.1), 162 (Figures A.6.11, A.6.12).

[313] *Id.* at 102; *see also* Richard S. J. Tol, *Social Cost of Carbon Estimates Have Increased Over Time*, 13 (6) Nature Climate Change 532-536 (May 2023), https://www.nature.com/articles/s41558-023-01680-x (attached as Exhibit MM).

information on pollution, and the use of this information in strengthening environmental protection programs and recommending policy changes." 5 U.S.C. app. 1, Reorganization Plan No. 3 of 1970, 84 Stat. 2086. Nonetheless, DOE took it upon itself to create this Report, seemingly without EPA's assistance or input.

The Report's origin and manner of creation further demonstrate its infirmity. The CWG Report was not created pursuant to any statute or regulation. *Cf.* 42 U.S.C. § 7607(d)(3) (requiring EPA to take account of and explain departures from "any pertinent findings, recommendations, and comments by the Scientific Review Committee established under [the Clean Air Act] and the National Academy of Sciences"). Rather, the Secretary of Energy privately commissioned the CWG and gave it a mandate to advance a particular viewpoint: to "cut against the prevailing narrative that climate change is an existential threat."[314] As described *supra* Section III.A.1, the creation and activities of the CWG violated FACA. Secretary Wright prejudged the issues in the Report, dictating its conclusions before it was even finished. *See supra* Section III.A.2. And DOE and the CWG did not follow basic policies concerning scientific integrity. *See supra* Section III.A.3.

A procedurally unlawful report, prepared in secret for a nonexpert agency by hand-selected outlier scientists, influenced by non-scientists (including Secretary Wright), and withheld from the public until the day it was used by another agency for a major proposed rule, is not entitled to any persuasive value or deference.

IV. DOE has not provided a meaningful opportunity for comment.

As DOE recognizes by soliciting comment in the first place, DOE should follow the APA's notice-and-comment requirements, particularly because DOE and other agencies intend to use the Report as a substantive source in rulemakings. *See* 90 Fed. Reg. at 36,150; CWG Report at x. In fact, EPA has already heavily relied on the draft CWG Report in its proposal to rescind the 2009 Endangerment Finding and Greenhouse Gas Motor Vehicle Standards. 90 Fed. Reg. at 36,292 n.10. But, as discussed more fully in our request to extend the comment period (attached as Exhibit NN), DOE has not provided a meaningful opportunity for comment on the CWG Report, for at least two reasons. *See Prometheus Radio Project v. FCC*, 652 F.3d 431, 450 (3d Cir. 2011) (stating that a meaningful opportunity for comment "means enough time with enough information to comment").

First, a 32-day comment period is woefully inadequate to fully evaluate and respond to the CWG Report considering the vast scope and complexity of climate science—the topic it purports (but fails) to cover. Even while acknowledging that its authors could not comprehensively review all topics in two months, the CWG Report claims to address numerous issues related to the causes and impacts of climate change, each of which, properly considered,

[314] Fisher, *Why I Helped Organize the Department of Energy's Climate Report*, *supra* note 142.

involves complex analyses and assumptions that require significant time to evaluate. The limited 32-day comment period is plainly insufficient to thoroughly assess the accuracy of analysis underlying the CWG Report. That is especially so considering the alarming lack of scientific peer review, discussed *supra* Section III.A.3, numerous instances of scientists and economists identifying misrepresentations of their research in the CWG Report,[315] and the concurrent comment period open on EPA's proposal to rescind its 2009 Endangerment Finding and Greenhouse Gas Motor Vehicle Standards, 90 Fed. Reg. at 36,288, which covers many of the same topics and relies heavily on a draft of this Report, and on which numerous interested stakeholders must also prepare comments on an artificially and unlawfully constrained timeframe. An extended comment period is also necessary to allow commenters to address the forthcoming review from the National Academies of Sciences, Engineering, and Medicine on the effects of greenhouse gas emissions on public health and welfare.[316]

Second, DOE failed to timely disclose factual material necessary to assess and understand the basis of the CWG Report. As detailed *supra* Section III.A, the CWG Report is procedurally and substantively flawed. Among other issues, much of the CWG Report contains the authors' original analyses, but the data and code underlying those analyses have not been made public. *See, e.g.*, CWG Report at Figures 6.2.1, 6.3.3, 6.3.4, 6.3.5, and 6.3.6. DOE also failed to disclose all committee-related records, ensure that committee meetings were open to the public and properly noticed, conduct scientific peer review, and disclose data and code underlying the CWG Report's analysis. Had DOE complied with FACA disclosure requirements and met scientific integrity standards, the public would have a more complete and transparent understanding of the CWG Report's origins, compilation process, and evaluation, if any, by independent scientists of its content. Instead, DOE did not disclose any relevant information until July 29, 2025, even though the CWG begin assembling the CWG Report in March 2025 and produced a draft to EPA in May 2025. *See* 90 Fed. Reg. at 36,292 n.10. Moreover, these failures cast serious doubt on whether the DOE would have issued the CWG Report in its current form had it properly complied with FACA and scientific integrity requirements. *See Am. Pub. Gas Ass'n v. U.S. Dep't of Energy,* 72 F.4th 1324, 1338–39 (D.C. Cir. 2023) (holding that DOE's failure to provide notice and comment prejudiced petitioners who demonstrated uncertainty as to whether their objections to studies would have influenced DOE's decision). In short, DOE has deprived the public of a meaningful opportunity to comment. If DOE truly intends to facilitate

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[315] Molly Taft, *Scientists Say New Government Climate Report Twists Their Work*, Wired (July 30, 2025, 4:31 PM), https://perma.cc/96BV-UZ7R; Paul Voosen, *Contrarian Climate Assessment from U.S. Government Draws Swift Pushback*, Sci.: ScienceInsider (July 30, 2025, 5:45 PM ET), https://www.science.org/content/article/contrarian-climate-assessment-u-s-government-draws-swift-pushback; Zeke Hausfather, *How the DOE and EPA Used and Misused My Research*, The Climate Brink (August 2, 2025), https://perma.cc/QY6J-HP42; Tol, *supra* note 278.

[316] News Release, Nat'l Acads. of Scis., Engi'g & Med., National Academies Launch Fast-Track Review of Latest Evidence for Whether Greenhouse Gas Emissions Endanger Public Health and Welfare (Aug. 7, 2025), https://perma.cc/5ATW-M47H.

"open, respectful, and informed debate" through public comment, as Secretary Wright claims, CWG Report at viii, DOE must immediately withdraw the CWG Report to remedy its procedural infirmities and then provide sufficient time and information to allow public comment.

V. Conclusion

Our communities are suffering devasting harms from climate change. These harms will worsen dramatically unless we aggressively reduce greenhouse gas emissions. The CWG, which was assembled to hamper emissions reduction efforts, is already accomplishing its goal. The actions of DOE and this group plainly violate numerous procedural requirements for advisory groups and scientific work in the federal government. The scientific, economic, and policy conclusions in the CWG Report are erroneous, unsupported, and misleading. For these reasons, DOE must withdraw the unlawful and misguided Report.

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