Decades of Deceit

The Case Against Major Fossil Fuel Companies for Climate Fraud and Damages

HIGHLIGHTS

Dozens of states, counties, cities, and tribes across the United States and its territories are currently suing major fossil fuel companies for fraud, climate damages, or racketeering. This report assesses the wealth of documentary evidence behind these lawsuits—including recently released internal corporate documents. The evidence could hardly be clearer: For decades these companies possessed detailed and accurate knowledge about the dangers their products pose to the global climate and understood that climate action would threaten their business models. Yet they planned, funded, and continue to engage in a campaign to profit from the planet's destruction by deceiving the public and blocking climate action. Ongoing investigations link a criminal hacking scheme targeting climate accountability advocates to a Washington, DC, lobbying firm and one of its clients—a major oil and gas corporation.

At a time when the federal government is backsliding on climate action and pandering to fossil fuel interests, it is more important than ever to hold these corporations accountable for exacerbating the climate crisis.

L. Delta Merner

Kathy Mulvey

Laura Peterson

Seth Shulman

May 2025

www.ucs.org/resources/decades-deceit

https://doi.org/10.47923/2025.15837

Union of Concerned Scientists

CONTENTS

Executive Summary

This report draws on dozens of internal fossil fuel industry documents obtained through investigative research, lawsuits, congressional subpoenas, publicly available reports, and industry testimony. It provides a decades-long review of what fossil fuel companies knew about climate change, when they knew it, and, critically, the extreme steps they took to deceive the public to protect their profits at the expense of people and the planet.

Scientists are now increasingly able to quantify the role of human-caused emissions in driving climate impacts and evaluate how carbon emissions from fossil fuels extracted by particular companies have contributed to climate change. Research has determined that just 122 companies are responsible for more than 94 percent of all industrial carbon dioxide (CO_2) emissions since 1959 and 75 percent of all industrial CO_2 emissions since 1981. In these time frames, fossil fuel companies already had clear scientific evidence that their products were contributing to climate change.

What Fossil Fuel Companies Knew About Climate Change—and When They Knew It

The report links to key documents spanning many decades, to let people see the evidence of this deception for themselves. These documents include the following:

- A 1980 presentation by Stanford climate scientist John Laurmann to the American Petroleum Institute, the fossil fuel industry's largest trade association, in which Laurmann said global warming caused by fossil fuels would bring "major economic consequences" with potentially "globally catastrophic effects."

- An internal 1988 report by Shell, acknowledging the significant portion of carbon emissions the company is responsible for and warning that "by the time the global warming becomes detectable it could be too late to take effective countermeasures to reduce the effects or even to stabilize the situation."

- Testimony by Martin Hoffert, former head of ExxonMobil's Research & Engineering division, at a 2019 congressional hearing. "Exxon was publicly promoting views that its own scientists knew were wrong," Hoffert testified. "This was immoral and has greatly set back efforts to address climate change."

What Fossil Fuel Companies Did Instead of Addressing Climate Change

Oil and gas companies were highly aware of the risks to them if the public learned about climate change threats and demanded accountability.

The companies feared similar consequences as those faced by the tobacco industry for the harms caused to public health by its products—which included a payout in the hundreds of billions of dollars from a landmark 1998 settlement. So the fossil fuel industry developed and deployed an aggressive campaign of deception and disinformation about climate science.

A 1998 "Roadmap" memo prepared by the American Petroleum Institute explicitly outlined how the companies could try to increase uncertainty among the public and policymakers about the realities of climate science. "Victory will be achieved when . . . average citizens 'understand' (recognize) uncertainties in climate science," the plan stated.

The following decades saw the industry unleash these strategies and many others to distract and confuse the public. This report describes the following documentation of these strategies:

- Court documents alleging a coordinated scheme to hack into the email accounts of staff members at the Union of Concerned Scientists (UCS) and several other public interest organizations, all of whom were working to hold fossil fuel companies accountable for their role in climate change. The documents, together with related reporting, suggest that the US government possesses evidence the criminal scheme was indirectly paid for by ExxonMobil and that one of its lobbying firms, the Washington, DC-based DCI Group, provided a list of "targets" to a middleman linked to the hackers and sent the fruits of the hacking to the oil and gas company.

- Internal ExxonMobil communications subpoenaed by Congress in 2021. The evidence shows executives were aware that they were failing to invest sufficiently in a biofuels program, even while they were actively promoting the program as an example of the company's commitment to environmental sustainability.

- A trade show presentation by FTI Consulting, the PR agency hired to build and run the Energy in Depth website, which attacks climate accountability experts while promoting false claims about oil, fossil gas, and environmental and economic issues. Launched in 2009 by the Independent Petroleum Association of America, Energy in Depth has depended on backing from fossil fuel companies, including BP, Chevron, ExxonMobil, and Shell. The presentation states that the value of such programs and platforms lies in their "ability to say, do and write things that individual company employees cannot and should not."

- Video of an infamous and shockingly candid interview in which Keith McCoy, then ExxonMobil's senior director of government affairs, admits that the corporation used front groups as part of its "fight" against climate science.

Preserving Access to Justice and Ratcheting Up Climate Accountability

A careful and thorough review leaves little room for doubt that major fossil fuel corporations deserve to be held accountable through all lawful means for their decades of climate deception and the resulting devastating damages.

UCS is calling for elected officials, investors, financiers, experts, and the public to increase pressure on these companies to do the following:

- ✓ Cease disinformation and greenwashing on climate science, public policy, and corporate actions.

- ✓ Stop obstructing science-informed public policy and its implementation.

- ✓ Pay an equitable share of the costs for climate damages; climate adaptation; and the environmental, social, and systemic impacts of fossil fuel products and production.

- ✓ Fully disclose, and regularly and publicly report on, risks and impacts to the climate, communities, and the economy.

- ✓ Accelerate actions, investment, and business planning for a fair and fast phaseout of fossil fuels worldwide.

- ✓ Stop violating civil rights, human rights, and the rights of Indigenous peoples.

Further, the report warns of a potential renewed push for a blanket waiver of liability for the fossil fuel industry and calls on federal representatives to do everything in their power to ensure any such effort does not succeed—so that communities harmed by climate change have access to justice and funding, and these corporations face legal and legislative consequences for their misconduct.

Introduction
The Case Against Major Fossil Fuel Companies

Climate change is no longer a distant threat; its impacts are already devastating communities worldwide, intensifying many kinds of extreme weather events, driving sea level rise, and harming human health. Advances in climate attribution science, which quantifies the extent to which human activities are responsible for observed changes in the climate system, show it is indisputable that the primary driver of these escalating harms is the burning of fossil fuels. Despite this, the cost of climate change falls disproportionately on taxpayers and communities on the front line of those impacts, rather than on the corporations that knowingly caused the crisis.

A mounting body of documentary evidence—reinforced by recently released internal corporate documents—demonstrates that major fossil fuel companies have known for decades that the continued extraction, production, promotion, and sale of their products would lead to catastrophic consequences, and that action to ward off the crisis would threaten their bottom lines. Instead of acting responsibly, they engaged in a long-term, deliberate disinformation campaign to sow public doubt, block climate action, and continue profiting from fossil fuel extraction at the expense of the planet. These companies have not only failed to take responsibility for their role in the climate crisis but also actively obstructed efforts to transition to a clean energy future.

Given this overwhelming evidence, legal action against the fossil fuel industry is gaining traction. Several dozen states, counties, cities, and tribes across the United States and its territories have filed lawsuits against fossil fuel corporations, seeking accountability for fraud, climate damages, or racketeering. These cases, part of a growing global movement for climate justice, contend that fossil fuel companies knowingly misled the public about climate science and the risks of continued fossil fuel use. The lawsuits argue that, much like the tobacco industry in its deception about the dangers of smoking, fossil fuel companies have long understood the harm their products cause and chose to prioritize profit over people and the planet.

The Need for Accountability and Justice

Climate justice remains elusive. Fossil fuel corporations deploy vast legal resources to delay proceedings, seeking to evade accountability. More concerning still, fossil fuel corporations may revive past attempts to shield themselves from liability by, for example, lobbying Congress to grant them immunity akin to protections afforded to gun manufacturers. These efforts, if successful, would represent a devastating setback for climate accountability and the public interest.

Holding these corporations responsible is a matter of both justice and necessity. Without intervention, these companies will continue their deception, delaying the urgent action needed to mitigate further climate destruction. Public awareness and legal pressure are critical tools in demanding that fossil fuel companies pay for their role in the climate crisis and contribute to paying the cost of addressing and adapting to the damage they have caused. The

lawsuits currently making their way through the courts are not just focused on securing financial compensation—some intend to establish accountability, prevent future deception, and ensure that those responsible for climate harm can no longer operate with impunity.

This report provides a comprehensive analysis of the legal and scientific case against major fossil fuel companies. It details what these corporations knew, when they knew it, and how they deliberately misled the public and influenced policymakers to continue profiting from planetary destruction. By exposing the extent of industry deception and the strength of the lawsuits seeking justice, the Union of Concerned Scientists (UCS) aims to inform courts, advocates, policymakers, regulators, and the public about the critical need to hold these companies accountable.

Mounting Evidence of the Global Climate Crisis

To understand how strong the case is against the fossil fuel companies, it is important to first briefly review what scientists know about global climate change and its causes.

Of course, you do not need to be an academically trained scientist to recognize that climate change is already wreaking havoc on our planet; worsening heat waves, wildfires, flooding, and droughts; melting glaciers and polar ice masses; raising sea levels; and threatening human health. For centuries, Indigenous communities and frontline populations—many of whom are scientists of the environment, with holistic understandings of the interconnected drivers of climate change—have documented changing environmental conditions, recognizing patterns of disrupted weather, ecological shifts, and resource depletion caused by extractive industries (Whyte et al. 2023). Their observations align with each other, provide robust evidence of climate-related changes and strategies for adaptation, and complement the Western scientific measurements recorded over the past century.

Today, we see the effects of climate change in almost daily reports of severe weather events and a host of other documented developments, from extinctions to ocean acidification that threatens the entire marine ecosystem. We know that droughts have become more frequent in many areas, lengthening wildfire season in the US Western states, for example. Extremely heavy rainfall has also become more common in other regions, such as parts of the Eastern United States, leading to increased and sometimes unprecedented flooding (Marvel et al. 2023).

To appreciate the scale of the problem, consider one robust data source: the US National Oceanic and Atmospheric Administration (NOAA), which has tracked extreme weather and climate-related disasters, including hurricanes, wildfires, droughts, and floods. According to NOAA data, 2024 saw 27 confirmed weather and climate disaster events that each caused damages amounting to $1 billion or more.

The number of such events fluctuates from year to year, but climate change is altering the frequency and severity of certain extreme events that contribute to costly disasters (Seneviratne et al. 2021). Multiple factors contribute to the increase of such events, including population changes, infrastructure expansion, and greater exposure to hazards, as well as a changing climate that can intensify certain extreme events.

The overall trend is unmistakable: Over the past five years, NOAA reports that there have been, on average, 23 billion-dollar disaster events per year. Over the prior decade (2010–19)

NOAA tracked 13.1 billion-dollar disasters per year, using adjusted dollar amounts to account for inflation. The decade of the 2000s (2000–2009) saw an average of 6.7 (inflation-adjusted) billion-dollar disasters; the 1990s (1990–99) saw an average of 5.7 such disasters per year; the 1980s (1980–89) saw 3.3 such events (NOAA NCEI 2020).

The implications of climate change for human health are also increasingly apparent, as rising temperatures, poor air quality, and extreme weather events contribute to a growing array of health crises. The World Health Organization predicts that climate change will cause an additional 250,000 deaths annually between 2030 and 2050, due to complications arising from heat exposure, malnutrition, and the spread of infectious diseases (WHO 2023). Additionally, worsening air quality from increased wildfire smoke and industrial emissions has been linked to respiratory problems and cardiovascular diseases (Chen et al. 2021).

The Science of Climate Change Is Well Established

For all the industry-stoked disinformation and bad-faith political debate about climate change, the underlying science is clear and beyond dispute about what is driving these changes. Scientists have known for well over a century that carbon dioxide (CO_2) in the Earth's atmosphere traps heat like a blanket. When fossil fuels are burned, CO_2 is released and increases in concentration. As the proportion of CO_2 increases in the atmosphere, it lets in the sun's rays but traps an increasing amount of heat radiating from the Earth's surface.

In 1856, Eunice Foote, a scientist and women's rights advocate, was the first to experimentally demonstrate the "greenhouse effect" of CO_2, publishing her findings in the *American Journal of Science and Arts* (Foote 1856). In 1896, scientist Svante Arrhenius showed that rising levels of CO_2 in the atmosphere would trap a growing proportion of the sun's heat and cause the planet to warm. Arrhenius quantified the impact of CO_2 in the atmosphere and hypothesized that fossil fuel combustion would increase global temperatures (Arrhenius 1896). His work was widely recognized in the field and was included in many academic geology texts throughout the early 20th century.

Beyond the powerful theoretical understanding, though, scientists have long known precisely how much CO_2 is in the atmosphere because they have been carefully measuring it for generations. Many research teams around the world now track CO_2 levels, but one of the most respected sources of data began with the work of a scientist named Charles David Keeling. From a weather monitoring facility in Hawai'i, far from industrial resources that might skew the results, Keeling began taking measurements in 1957.

Today, the Mauna Loa Observatory, where Keeling set up his experiment, continues to make hourly measurements of the CO_2 in the atmosphere. The measurements are so precise and have been handled so consistently that they have long been considered the gold standard in the field of climate studies.

Keeling's work eventually earned him the National Medal of Science, the nation's top honor for a scientist. His Keeling Curve, as it is now known, is engraved on the wall of the National Academy of Sciences' headquarters in Washington, DC.

In 1958, Keeling measured 315 parts per million (ppm) of CO_2 in the atmosphere. Levels have grown steadily since then. For 2024, the Mauna Loa Observatory reports atmospheric measurements of roughly 422 ppm of CO_2—a 33 percent increase (NOAA GML 2025).

We also know temperatures are rising because we have been taking precise temperature measurements around the world for centuries. Scientists have consistently charted increases in global average temperatures, with particularly sharp warming observed in polar regions. The world has experienced record-setting temperatures since 2005, and the 10 warmest years since 1850 have all occurred in the past decade (NOAA NCEI 2024).

Fossil Fuels Leave Fingerprints

For a host of powerful reasons, scientists are confident that rising global temperatures are due to increasing levels of heat-trapping gases, such as CO_2, in the atmosphere, primarily from the burning of fossil fuels. One key source of confidence is a technique sometimes known as "climate fingerprinting." Similar to how detectives analyze forensic evidence, climate scientists can study carbon molecules and gradations in temperature between the lower and upper atmosphere for clues about the source of warming trends.

Benjamin Santer, long a climate scientist at the Lawrence Livermore National Laboratory in California, is one of the researchers who first explored the implications of climate fingerprinting. He recognized that if the warming were caused by increased energy from the sun, for instance, careful temperature measurements of the atmosphere at different altitudes would reveal that it was warming from the top straight down to Earth's surface. Volcanic eruptions would yield a distinctly different temperature profile.

But Santer's research, now replicated by many other scientists around the world, shows a telltale warming of the lower atmosphere, or troposphere, and a cooling of the upper layer of the atmosphere, or stratosphere. This pattern precisely matches the expected "fingerprint" of heat-trapping CO_2 from fossil fuel emissions building up in the atmosphere (Santer et al. 1996; Santer et al. 2023).

In addition to the upward trend in global average temperatures, scientists have identified multiple other indicators of a rapidly changing climate, including warming oceans, rising sea levels, more frequent extreme weather events, thawing permafrost, earlier snowmelt, shifting wildlife habitats, and longer wildfire seasons. Collectively, these lines of evidence reinforce the conclusion that human activities are altering Earth's climate in profound ways.

The Emergence of Powerful Climate Attribution Science

Although scientists have long understood that the burning of fossil fuels was the major driver of climate change, they have discovered powerful ways, over the past several decades, to tease apart the natural and human factors that contribute to changes in the climate and the oceans. The fast-developing field, known as climate attribution science, addresses how human activities contribute to the warming of the atmosphere and oceans and to specific climate impacts (IPCC 2013). Scientists are now increasingly able to quantify the role of human-caused emissions in driving climate impacts and to assess how carbon emissions from fossil fuels extracted by particular companies have contributed to climate change.

The rapid expansion of observational networks—from satellites to ground sensors—paired with major advances in climate modeling allow researchers to generate increasingly precise estimates that underpin attribution analyses. This synergy helps scientists ascribe the contribution of fossil fuel emissions to specific climate impacts and project future changes with greater accuracy.

In turn, communities, policymakers, and others gain scientific insights for devising adaptation strategies, inform accountability efforts, and improve understanding of climate risks. As attribution science continues to advance and gains greater recognition, its findings enable us to recognize the direct link between climate impacts and the emissions driving them. These advancements can be especially crucial for Indigenous nations, small island states, and frontline communities who have long experienced and documented climate shifts.

A key link in quantifying the contributions of major fossil fuel companies to cumulative global emissions comes from a tool known as the Carbon Majors database, now run by a global nonprofit based in the United Kingdom (UK) called InfluenceMap (InfluenceMap 2024).

This database tabulates the cumulative historical carbon emissions, from 1854 through 2022, of 122 major oil and gas companies, as well as producers of cement, an industrial product with very high carbon intensity. The database includes both investor-owned and state-owned corporations, as well as nation-state producers. This relatively small number of producers accounts for roughly 72 percent of total global fossil fuel and cement CO_2 emissions since 1751. Astonishingly, more than 70 percent of these global CO_2 emissions can be attributed to just 78 companies or state-producing entities (InfluenceMap 2024).

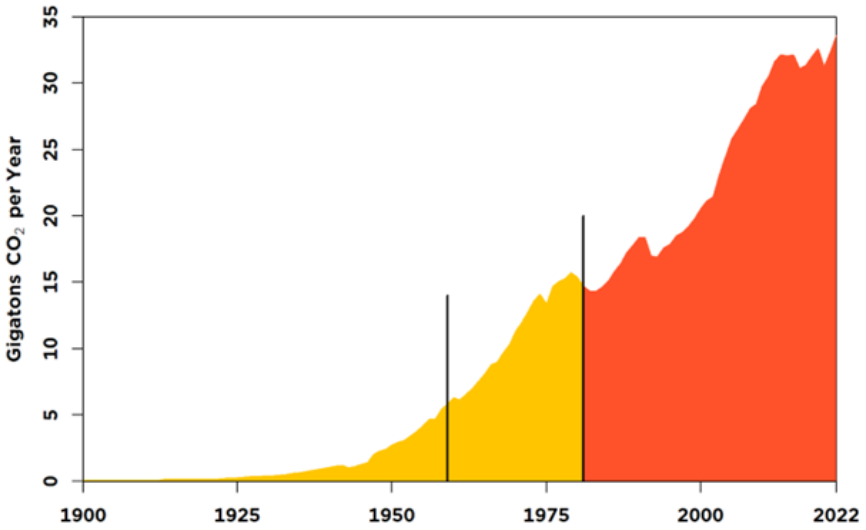
The Carbon Majors database was initially developed over the course of eight years by an energy expert named Rick Heede. Tracking down production figures in fossil fuel companies' annual reports, which were scattered among university archives on multiple continents, Heede spent thousands of hours compiling worldwide company data dating back to the Industrial Revolution and entering the data into detailed spreadsheets. Heede's years of painstaking work led to two crucial findings.

First, he determined that just 90 companies have produced and marketed the fossil fuels and cement responsible for almost two-thirds of the world's industrial heat-trapping carbon emissions over the past two and a half centuries. Of these, 50 are investor-owned oil and gas companies, including BP, Chevron, ConocoPhillips, ExxonMobil, and Shell (Heede 2014). [1]

Secondly—and perhaps equally consequential for understanding the role of major fossil fuel producers in climate change—the Carbon Majors database, which has since added some new companies, shows that 122 companies are responsible for more than 94 percent of all industrial CO_2 emissions since 1959 and 75 percent of all industrial CO_2 emissions since 1981 (Figure 1). In these time frames, fossil fuel companies already had clear scientific evidence that their products were contributing to climate change. The Carbon Majors database offers a key means through which scientists can trace carbon emissions on an annual basis to the oil and gas sold by individual companies.

[1] *Royal Dutch Shell changed its name to Shell in 2022. Exxon merged with Mobil to become ExxonMobil in 1999.*

Figure 1. Industrial CO_2 Emissions Since 1900



Just 122 fossil fuel and cement companies are responsible for more than 94 percent of all industrial CO_2 emissions since 1959 and 75 percent of all industrial CO_2 emissions since 1981.
Source: InfluenceMap 2025.

UCS-Led Research Traces Climate Impacts to Fossil Fuel Companies

UCS has been a leader in peer-reviewed scientific research linking climate impacts to emissions that trace directly to fossil fuel companies. Research teams led by UCS climate scientists and joined by a variety of top academic expert collaborators have published a series of pathbreaking studies quantifying the contribution of major fossil fuel companies to increases in global temperatures, sea level rise, ocean acidification, and increasing damage from wildfires. These studies provide valuable scientific evidence on emissions and their impacts and represent one component of a broader framework for assessing responsibility.

In 2017, a team led by Brenda Ekwurzel, a UCS climate scientist, documented the link between emissions from major carbon producers and the rise in global temperature and sea level (Ekwurzel et al. 2017). This team's groundbreaking research found that emissions traced to the largest 90 carbon producers accounted for nearly half of the rise in global average temperature since 1880 and about 30 percent of global sea level rise relative to 1880 levels.

Building on this work in 2019, a study led by former UCS climate scientist Rachel Licker focused on how emissions from major carbon producers were contributing to ocean acidification, a consequence of excess CO_2 being absorbed by ocean waters (Licker et al. 2019). Scientists have long known that the ocean is absorbing a large portion of the carbon pollution released when gas, oil, and coal are burned. This UCS-led study was the first to quantify the impact of ocean acidification from carbon emissions traced to major carbon producers.

The research found that, between 1880 and 2015, more than half (approximately 55 percent) of the *increase* in ocean acidity was tied to emissions from just 88 fossil fuel producers and

cement manufacturers, led by Chevron, ExxonMobil, BP, Shell, and ConocoPhillips. The study also quantified the impact from just the time period 1965–2015—during which the companies in question understood the impacts their products were causing. The research found that roughly 51 percent of the decline in surface ocean pH during that period was caused by emissions from these 88 companies.

In 2023, a team of scientists led by another former UCS climate scientist, Kristina Dahl, quantified the contribution of major carbon producers to the increase in wildfires in the western United States and southwestern Canadian forests. Building on previous UCS research, the team's peer-reviewed study found that some 19.8 million acres of burned forestland—*37 percent of the total area scorched by forest fires in the western United States and southwestern Canada between 1986 and 2021*—can be attributed to heat-trapping emissions traced to the world's 88 largest fossil fuel producers and cement manufacturers (Dahl et al. 2023).

Most recently, a 2025 study led by former UCS science fellow Shaina Sadai built on and extended earlier research by quantifying not only the historical but also the long-term future contributions of major fossil fuel companies to sea level rise (Sadai et al. 2025). The study found that emissions traced to the 122 largest carbon producers from 1854 to 2020 contributed to 37–58 percent of the increase in average global surface temperatures and 24–37 percent of present-day sea level rise. These past emissions have already locked in an additional 10–22 inches of global sea level rise by 2300—regardless of future reductions in climate-warming pollution—posing escalating risks to coastal and island communities.

The study also modeled three counterfactual scenarios, revealing that if fossil fuel companies had begun reducing emissions in 1950 or 1990, global temperatures today would be 0.18°C–0.23°C lower and sea level rise would be 0.7–1.2 inches lower. These findings underscore the long-term consequences of delayed climate action by major carbon producers and highlight the disproportionate burden placed on communities that have contributed the least to the climate crisis.

These studies—and other attribution studies like them—help to quantify the role of fossil fuel companies in driving climate impacts, offering policymakers, elected officials, and legal experts valuable scientific insights for assessing the role of major carbon producers in climate damages. A 2023 analysis by social scientist Marco Grasso and Heede uses the Carbon Majors dataset to calculate that the top 21 fossil fuel companies owe climate reparations of $209 billion annually to communities most harmed by climate impacts and their disinformation, including those in the Global South, which have been affected disproportionately (Grasso and Heede 2023).

There is no question that the Earth is warming, that disastrous climate impacts are already occurring and imposing enormous economic and social costs, and that continued use of fossil fuels extracted and sold by relatively few major companies will lead to further warming and worsening impacts.

Chapter 1
What Fossil Fuel Companies Knew About Climate Change—and When They Knew It

As noted earlier, increasingly, climate attribution science is accurately quantifying the share of climate impacts that can be attributed to the emissions traced to individual fossil fuel companies. While scientists can make these calculations linking the contributions of fossil fuel companies to climate impacts, a key step toward assessing these companies' culpability requires examining exactly how much the companies knew about the climate change their products were causing—and when they knew it.

Internal corporate documents that have come to light via investigative research, lawsuits, and government subpoenas now show clearly that by the late 1950s, the companies knew a good deal about the threat posed by climate change. The evidence shows that by the 1970s and early 1980s, fossil fuel companies had developed a deep and sophisticated understanding of climate change that far exceeded that of the general public and policymakers.

The selected internal documents, corporate presentations, and congressional testimonies shared in this report leave little doubt that major fossil fuel corporations recognized the projected impacts of climate change for at least a half century. The evidence shows that these companies possessed detailed knowledge of the risks their products posed to the planet, a circumstance that greatly increases their culpability.

These documents show that scientists employed by major fossil fuel companies made climate modeling predictions that have since proven to be remarkably accurate. Yet, despite their understanding of the damage their products were causing the planet, these companies sought to hide the scientific evidence, and they worked activelyto confuse the public about the realities of the climate damage they were causing. In some instances they relied on clandestine schemes and benefited from criminally obtained material.

When reviewing this body of evidence, it is important to bear in mind that ***three-quarters of all industrial CO_2 emissions driving climate change have occurred since 1981.*** By that year, these companies could have deployed their substantial knowledge about climate science to take steps to alert the public and policymakers and work to prevent the damage they knew their products were causing.

Fossil Fuel Companies Have Understood Since the 1950s That Climate Change Was Happening

Beginning in the late 1950s, global dependence on oil, gas, and coal, as well as gradually emerging environmental concerns, made climate change a topic of considerable interest in many scientific circles. Importantly, renowned nuclear physicist and Manhattan Project

scientist Edward Teller discussed the topic in his 1959 keynote address at an event in New York City organized by the American Petroleum Institute (API), the nation's largest oil industry trade association. With many high-level industry executives in attendance, Teller discussed the problem of rising levels of CO_2 in the atmosphere, caused by the burning of fossil fuels. He warned the assembled executives that "a temperature rise corresponding to a 10 [percent] increase in carbon dioxide *will be sufficient to melt the icecap and submerge . . . all the coastal cities* [emphasis added]." As Teller put it: Since "a considerable percentage of the human race lives in coastal regions, I think that this chemical contamination is more serious than most people tend to believe" (Teller 1960).

As noted previously, the fundamental process Teller was highlighting had been understood for more than a century. By 1965, the problem of global warming was recognized as a matter of sufficient concern that then–President Lyndon Johnson's science advisors devoted an entire section to the subject in the administration's high-profile report *Restoring the Quality of Our Environment*, noting "the concerning rise of atmospheric carbon dioxide due to human activity" (The White House 1965).

As the report's introduction explained: "Pollutants have altered on a global scale the carbon dioxide content of the air." The section addressing the issue, compiled by a group of experts chaired by well-known oceanographer and climate scientist Roger Revelle, recognized that CO_2 levels in the atmosphere had already increased by roughly 7 percent between 1860 and 1960. The experts also determined that fossil fuel combustion was the only "new major producer of carbon dioxide" that could plausibly explain the increase. Revelle and his co-authors predicted that, if the amount of CO_2 in the atmosphere continued to grow at a steady rate, it portended a future of melting ice caps, rising sea levels, and acidification of water sources (The White House 1965). They presciently (and accurately) warned:

> "By the year 2000 the increase in atmospheric CO_2 will be close to 25%. This may be sufficient to produce measurable and perhaps marked changes in climate, and will almost certainly cause significant changes in the temperature and other properties of the stratosphere." (The White House 1965)

As we now know, the fossil fuel industry paid close attention to these warnings. In 1968, the API even commissioned its own report on the subject from the Stanford Research Institute (Box 1). The report, by Stanford scientists Elmer Robinson and R. C. Robbins, identified growing levels of CO_2 in the atmosphere as a danger:

> "Significant temperature changes are almost certain to occur by the year 2000, and these could bring about climatic changes. . . . If the Earth's temperature increases significantly, a number of events might be expected to occur including the melting of the Antarctic ice cap, a rise in sea levels, warming of the oceans and an increase in photosynthesis." (Robinson and Robbins 1968)

This 1968 scientific report to the fossil fuel industry also starkly warned that left unabated, "there seems to be no doubt that *the potential damage to our environment could be severe* [emphasis added]" (Robinson and Robbins 1968).

Box 1. American Petroleum Institute (API)/Stanford Research Institute Report, 1968

Commissioned by API, this report by Stanford Research Institute scientists Elmer Robinson and R. C. Robbins, titled *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants*, highlighted for the fossil fuel industry the growing threat posed by rising carbon dioxide (CO_2) levels in the atmosphere. It also identified rising CO_2 levels as a driver of climate change.

With eerie prescience, this report accurately predicted that, given trends at the time, CO_2 levels could reach 400 parts per million by the year 2000 and that urgent action was needed. The report warned that *"there seems to be no doubt that the potential damage to our environment could be severe* [emphasis added]*."*

(Robinson and Robbins 1968; read excerpts at https://www.smokeandfumes.org/documents/document16.)

It is important to emphasize that we know fossil fuel executives were made aware of these findings, as an assessment by the Center for International Environmental Law (CIEL) explains: "We know the Robinson report was seen by industry leaders. In 1971, Robinson delivered the major findings of the study to industry experts gathered at the World Petroleum Congress." Furthermore, CIEL notes, a 1972 industry report about air pollution, authored by a steering committee of high-level executives and submitted to the US Department of the Interior, specifically acknowledges the 1968 report (CIEL 2017).

Fossil Fuel Companies Recognized the Scientific Consensus That Climate Change Was Happening—and That It Was Caused by the Burning of Their Products

In 1977, Exxon scientist James Black gave a presentation to the management committee of the Exxon Corporation (Box 2). Black predicted that if the burning of fossil fuels continued unabated, it would lead to a 1°C–3°C global temperature increase above preindustrial levels by 2050.

Black said that the "greenhouse effect" problem was "one of the most significant environmental issues" of the coming decades (Black 1978). His presentation also made clear that scientists at the time were in widespread agreement that atmospheric levels of CO_2 were increasing and that the increasing levels were caused by fossil fuel combustion.

Box 2. James Black Exxon Presentation on the "Greenhouse Effect" to the Exxon Corporation Management Committee, 1977

In 1977, Exxon scientist James Black made a presentation to the management committee of the Exxon Corporation in which he predicted that rising levels of carbon dioxide in the atmosphere would lead to an increase in global average temperature between 1°C and 3°C by 2050. He also warned that the company had a 5- to 10-year window in which to gather the necessary information and act.

Black said that the issue—which he called the "greenhouse effect"—was "one of the most significant environmental issues" of the coming decades. His presentation clearly stated that scientists at the time were in widespread agreement that atmospheric levels of carbon dioxide were increasing and that the increasing levels were caused by fossil fuel combustion.

As Black put it: "In the first place, there is general scientific agreement that the most likely manner in which mankind is influencing the global climate is through carbon dioxide release from the burning of fossil fuels. A doubling of carbon dioxide is estimated to be capable of increasing the average global temperature by from 1 to 3 degrees C, with a 10-degree C rise predicted at the poles."

(Black 1978; read at https://www.climatefiles.com/exxonmobil/1978-exxon-memo-on-greenhouse-effect-for-exxon-corporation-management-committee/.)

Black's presentation appears to have caused a considerable stir inside Exxon.

As internal documents show, a 1980 memo from the Exxon Research & Engineering company stated that "[t]here is little doubt that these observations indicate a growth in atmospheric CO_2. It is also believed that the growth of atmospheric CO_2 has been occurring since the middle of the past century, i.e., coincident with the start of the Industrial Revolution" (Shaw 1980). We now know that Exxon Research & Engineering's Harold Weinberg even sent a memo about the subject to Exxon engineer N. Richard Werthamer (Weinberg 1980).

Roger Cohen, then Exxon's director of theoretical and mathematical sciences, summarized Black's presentation in a 1982 memo to other Exxon executives, writing that "*a clear scientific consensus* has emerged regarding the expected climatic effects of increased atmospheric CO_2 [emphasis added]." Cohen also wrote:

> "[T]here is *unanimous agreement in the scientific community* that a temperature increase of this magnitude would bring about significant changes in the earth's climate, including rainfall distribution and alterations in the biosphere." (Cohen 1982; emphasis added)

Exxon had a particularly robust corporate climate research program in the 1970s. But it was not alone among fossil fuel companies in recognizing the severity of the climate change problem. In 1979, for example, the API convened a task force for its member companies. This Climate and Energy Task Force included senior scientists and engineers from nearly every major US and multinational oil and gas company at the time. That list included Exxon, Mobil (now ExxonMobil); Amoco, Standard Oil of Ohio (now part of BP); Standard Oil of California,

Gulf Oil, and Texaco (now part of Chevron); Phillips Petroleum (which later merged with Conoco to create ConocoPhillips); and Shell (FTC 2002; BP 2011; Banerjee 2015; Chevron 2022b; ExxonMobil 2023b;). During this period, these task force members were actively monitoring developments in climate science and sharing recent findings with one another.

Fossil Fuel Companies Projected Climate Impacts with a High Degree of Specificity and Accuracy

A remarkable feature of many of the internal fossil fuel industry documents that have surfaced to date is the extent to which they accurately describe and predict climate effects. To offer just one example, the authors of the previously mentioned 1968 Stanford Research Institute report submitted a supplemental report the next year to the API. It projected—more than 50 years ago—that atmospheric CO_2 concentrations would reach 370 ppm by the year 2000. When scientists measured the actual CO_2 concentrations in 2000, the readings closely matched the industry's 1969 prediction, at 369.64 ppm (NASA GISS, n.d.).

More proof of the fossil fuel industry's detailed understanding of climate change can be seen in an internal primer on climate science titled *The CO_2 "Greenhouse Effect": Technical Review*, written in 1982 by Marvin B. Glaser, then Exxon's environmental affairs program manager (Box 3). This report was clearly marked as "not for external distribution" but includes a cover memo showing it was shared with 15 Exxon managers, presumably in an effort to familiarize company personnel with the subject.

The document offers a detailed and complete review of the scientific consensus on climate change. It warns of "uneven global distribution of increased rainfall and increased evaporation" that it says would lead to a "dramatic impact on soil moisture, and in turn, on agriculture" (Glaser 1982). The report cautions that the US Midwest would dry out. It emphasizes the grave threat posed by rising sea levels:

> "In addition to the effects of climate on global agriculture, there are some potentially catastrophic events that must be considered. For example, if the Antarctic ice sheet which is anchored on land should melt, then this could cause a rise in sea level on the order of 5 meters. Such a rise would cause flooding on much of the U.S. East Coast, including the State of Florida and Washington, D.C." (Glaser 1982)

Box 3. Exxon Internal Primer on the "CO_2 Greenhouse Effect," by Marvin B. Glaser, 1982

In November 1982, Exxon's environmental affairs program manager circulated a detailed memo to Exxon management about the "CO_2 greenhouse effect." The report, a prescient internal primer on the threat posed by climate change, describes prospective climate effects with great specificity and accuracy, for example:

"In addition to the effects of climate on global agriculture, there are some potentially catastrophic events that must be considered. For example, if the Antarctic ice sheet which is anchored on land should melt, then this could cause a rise in sea level on the order of 5 meters. Such a rise would cause flooding on much of the U.S. East Coast, including the State of Florida and Washington, D.C.

"Although all biological systems are likely to be affected, the most severe economic effects could be on agriculture. There is a need to examine methods for alleviating environmental stress on renewable resource production—food, fiber, animal, agriculture, tree crops."

(Glaser 1982; read the report at https://www.climatefiles.com/exxonmobil/1982-memo-to-exxon-management-about-co2-greenhouse-effect/.)

Exxon's confidential internal primer projects a wide array of consequences borne out in subsequent years. It clearly states that warming would likely be "much greater at the polar regions" and "the dynamics of ocean currents" would be threatened, and notes the potential for climate change to exacerbate "international and interregional conflicts" (Glaser 1982).

According to the company's report, "All biological systems would be affected," and "the most severe economic effects could be on agriculture." It recommends studying "soil erosion, salinization, or the collapse of irrigation systems" to understand how society might be affected and might respond to global warming, and it even addresses the prospect of socioeconomic consequences, such as climate-driven health effects and "stress associated with climate-related famine or migration" (Glaser 1982).

This document is one of many internal memos that have surfaced, to date, from Exxon. Researchers Geoffrey Supran, Stefan Rahmstorf, and Naomi Oreskes—a team of geologists and science historians—reviewed all the major internal Exxon documents and scientific publications on the subject of human-caused climate change that were publicly known as of 2021 (Supran, Rahmstorf, and Oreskes 2023).

Overall, they found that Exxon's global warming projections turned out to "closely track" subsequent measured temperature increases. Using a variety of statistical metrics, they determined that 63–83 percent of Exxon's climate projections were statistically consistent with historical climate observations: "Our results show that in private and academic circles since the late 1970s and early 1980s, Exxon predicted global warming correctly and skillfully." Their findings lend quantitative evidence to the contention that Exxon "accurately foresaw the threat of human-caused global warming, both prior and parallel to orchestrating lobbying and propaganda campaigns to delay climate action" (Supran, Rahmstorf, and Oreskes 2023).

The analysis builds on their earlier work and concludes that while ExxonMobil's internal discussions accurately acknowledged the reality of climate change, the company's public communications told a dramatically different story from the ones the companies' scientists were telling internally (Supran and Oreskes 2017).

The 2023 study provides further evidence of ExxonMobil's duplicity. But it is important to recognize that the company was not alone. Similar work has shown that throughout the fossil fuel industry, companies deliberately misled the public about climate science, revealing a pervasive pattern in which these companies internally recognized climate risks while promoting doubt in public communications (Bonneuil, Choquet, and Franta 2021; Brulle 2023). Despite the detailed knowledge the industry had about the threat their products were posing to people and the planet, and despite the clear and growing scientific consensus about the reality and causes of climate change, these companies chose to follow the path of the tobacco industry closely, underwriting disinformation campaigns to increase public skepticism about what they privately knew to be true.

Fossil Fuel Companies Understood the Consequences of Climate Change Could Be Catastrophic and Urgent Action Was Needed

An abundance of documentary evidence exists to show that, in addition to recognizing the problem of climate change and projecting climate impacts with great accuracy, fossil fuel company representatives were explicitly informed by their own experts that the carbon emissions from the burning of fossil fuels would have dire consequences for people and the planet.

Examples abound, especially in internal correspondence among Exxon executives that has surfaced in recent years. In August 1981, for example, Cohen wrote a brief memo reviewing the company's emerging understanding of the severity of potential climate risks. In it, Cohen takes issue with an internal corporate document that had described projected climate change impacts by 2030 as "of a magnitude well short of catastrophic." Cohen called that assessment "too reassuring" and said that it was "distinctly possible that the CPD [corporate planning department] scenario will likely produce effects *which will indeed be catastrophic (at least for a substantial fraction of the earth's population)* [emphasis added]" (Cohen 1981, 163).

It was also well understood that urgent action was needed to address climate change. A 1978 memo from Exxon scientist James Black to F. G. Turpin, vice president of Exxon's Research and Engineering Company, stated, "Present thinking holds that man has a time window of five to ten years before the need for hard decisions regarding changes in energy strategies might become critical" (Black 1978).

Again, Exxon was not alone. Evidence shows that many fossil fuel companies recognized climate change's potentially catastrophic consequences.

For example, the API hosted its CO_2 and Climate Task Force on February 29, 1980, in the Manhattan Room of LaGuardia Airport in New York (Box 4). The minutes show that API representatives were in attendance, as were executives from Exxon, Texaco (now part of Chevron), and Standard Oil of Ohio (now part of BP) (Nelson 1980).

The task force invited Stanford scientist John Laurmann, "a recognized expert in the field of CO_2 and climate," to make a presentation to its members. The seven-hour meeting included a "complete technical discussion" of global warming caused by fossil fuels, including "the scientific basis and technical evidence of CO_2 buildup, impact on society, methods of modeling and their consequences, uncertainties, policy implications, and conclusions that can be drawn from present knowledge" (Nelson 1980).

Box 4. American Petroleum Institute (API) CO_2 and Climate Task Force, John Laurmann Presentation, 1980

At an extraordinary seven-hour meeting on February 29, 1980, in New York, hosted by the API, Stanford climate scientist John Laurmann presented members with a technical discussion of global warming caused by fossil fuels, including "the scientific basis and technical evidence of CO_2 buildup, impact on society, methods of modeling and their consequences, uncertainties, policy implications, and conclusions that can be drawn from present knowledge."

Laurmann told the task force that there was "strong empirical evidence that [the carbon dioxide] rise [was] caused by anthropogenic release of CO_2, mainly from fossil fuel burning." Unless fossil fuel production and use were controlled, he said, the planet could expect an increase in global average temperature of 2.5°C by 2038 that would bring "major economic consequences," as well as the prospect of a 5°C increase by 2067, with "globally catastrophic effects." Laurmann warned that there was "no leeway" regarding the "time for action."

(Nelson 1980; read the presentation at https://www.climatefiles.com/climate-change-evidence/1980-api-climate-task-force-co2-problem/.)

Laurmann informed the API's CO_2 task force that there was "strong empirical evidence" that the increase in levels of CO_2 in the atmosphere was "caused by anthropogenic release of CO_2, mainly from fossil fuel burning." According to Laurmann, unless fossil fuel production and use were controlled, atmospheric CO_2 would double preindustrial levels by 2038, using a 3 percent per year growth of atmospheric release rate, with "likely impacts" along the following trajectory: By 2005, there would likely be a 1°C increase in global average temperatures, with barely noticeable impacts. By 2038, there would be a 2.5°C increase in global average temperatures that risked major economic consequences and could "bring world economic growth to a halt." Finally, Laurmann noted that following this trajectory and with continued inaction, by 2067, an increase in average global temperature of 5°C could be expected, with what he called "*globally catastrophic effects* [emphasis added]" (Nelson 1980).

API distributed the minutes of the meeting and Laurmann's presentation to the entire CO_2 and Climate Task Force membership, which included scientists and executives from major US oil and gas companies, including Exxon, Mobil; Amoco; Phillips; and Texaco (Banerjee 2015).

Fossil Fuel Companies Realized Climate Change Posed a Threat to Their Businesses—Especially If the Public and Policymakers Became Knowledgeable and Engaged

The evidence shows that as early as the mid-1960s, many in the fossil fuel industry recognized that mounting levels of CO_2 in the atmosphere could have direct consequences for the industry's bottom line. The companies understood not only that their products were fueling climate change but that if the public mobilized and policymakers took action, they could be forced to pay for the damage. Rather than aligning their business models with a livable planet, they undertook decades of strategic disinformation campaigns that have disproportionately harmed communities of color, working-class populations, and Global South nations—many of whom now bear the worst impacts of climate destruction.

An example of this understanding of potential commercial implications came in 1965, when Frank Ikard, then president of the API, addressed industry leaders at the trade association's annual meeting. He relayed the findings of the recent presidential report on environmental quality. Ikard said that one of the report's "most important predictions" was that CO_2 was being added to the Earth's atmosphere by the burning of coal, oil, and natural gas at such a fast pace that "by the year 2000 the heat balance will be so modified as possibly to cause marked changes in climate beyond local or even national efforts" (Ikard 1965). Quoting the report's findings, he said:

> "The pollution from internal combustion engines is so serious, and is growing so fast, that an alternative nonpolluting means of powering automobiles, buses, and trucks is likely to become a national necessity." (Ikard 1965, 13)

As one 1979 internal Exxon memo starkly put it: "There is a possibility that an atmospheric CO_2 buildup will cause adverse environmental effects in enough areas of the world to consider limiting the future use of fossil fuels as [a] major energy source" (Ferral 1979).

In a 1984 internal Exxon presentation, Exxon's Shaw enumerated the calamities global warming could be expected to inflict if carbon emissions continued unabated. Shaw reiterated many of the effects mentioned in Marvin B. Glaser's confidential internal memo: the melting of polar ice, sea level rise, redistribution of rainfall, effects on agricultural productivity, accelerated growth of pests and weeds, detrimental health effects, and population migration, among other disastrous outcomes. And he ended his presentation starkly, saying: "We can either adapt our civilization to a warmer planet or avoid the problem by sharply curtailing the use of fossil fuels" (Shaw 1984).

Throughout the 1970s and 1980s, Shaw pressed internally at Exxon for the company to address the issue of climate change proactively. For example, in 1977, he circulated a memo to colleagues pointing out that the climatic effects of rising CO_2 "may be the primary limiting factor on energy production from fossil fuels over the next few centuries" (Shaw 1977).

But Shaw's pleas for action went unheeded. Instead, the company opted to scale back its climate research effort dramatically by the early 1980s. It then leaned heavily into sponsoring a covert climate science disinformation campaign to try to confuse the public and block governmental action.

Other companies followed a largely similar trajectory. Perhaps one of the most striking examples of a fossil fuel company's explicit focus on climate change's potential impact on the industry's business prospects can be seen in a confidential 94-page report written by a team at Shell in 1988, reflecting the findings of a five-year internal study group (Box 5). The report not only offers an extensive overview of climate science but also surveys the political landscape, including perceived legislative threats to the company around the world.

The 1988 internal Shell report explicitly acknowledges the burning of fossil fuels is a primary driver of CO_2 buildup and warns that global warming could "create significant changes in sea level, ocean currents, precipitation patterns, regional temperature and weather." The report notes that "by the time the global warming becomes detectable it could be too late to take effective countermeasures to reduce the effects or even to stabilize the situation." It adds that "the potential implications for the world are . . . so large that policy options need to be considered much earlier" and that more research should be directed "to the analysis of policy and energy options" (Shell Internationale Petroleum 1988).

The report even explicitly calculates the company's own assessment of the portion of carbon emissions for which it is responsible:

> "Fossil fuels which are marketed and used by the [Shell] Group account for the production of 4% of the CO_2 emitted worldwide from combustion.[2] Of these emissions, 80% come from [Shell] Group oil, 12% from [Shell] Group gas and 8% from [Shell] Group coal." (Shell Internationale Petroleum 1988, 29)

[2] The Carbon Majors analysis accounts for CO_2 and methane emissions from the operations and use of oil, gas, and coal extracted by a corporation or nationalized company. Shell calculated its own downstream Scope 3 CO_2 emissions, presumably also including those from oil and gas sold but not extracted by the company.

Box 5. The Shell Report: *The Greenhouse Effect*, 1988

A confidential 94-page report written by a team at Shell not only offers an extensive review of extant climate science but also surveys the political landscape, including perceived global legislative threats to the company.

The report acknowledges that the burning of fossil fuels is driving climate changes that "may be the greatest in recorded history" and could lead to lost ecosystems, rising sea levels, and disruption of food and water supplies. In addition, the report warns that:

"By the time the global warming becomes detectable it could be too late to take effective countermeasures to reduce the effects or even to stabilize the situation."

While assessing the perceived threats that mounting concern about climate change presents to Shell's business, the report also quantifies the company's contribution. It states that Shell is responsible for some 4 percent of the CO_2 emitted from combustion worldwide.

(Shell Internationale Petroleum 1988; read the report at https://s3.documentcloud.org/documents/4411090/Document3.pdf.)

A decade after the internal release of the 1988 Shell report *The Greenhouse Effect*, the company produced yet another confidential internal report. In that report, a Shell team envisions an eerily prescient scene to describe the threat climate change might pose to the fossil fuel business.

This 1998 Shell report offers a scenario projecting 12 years into the future, envisioning a series of violent storms in 2010. The storms cause extensive damage to the eastern coast of the United States and garner public outcry against the fossil fuel industry for its role in contributing to climate change. In this scenario, the insurance industry refuses to accept liability and a fierce debate ensues over who should bear the costs. The situation leads a coalition of environmental nonprofit groups to bring a class action lawsuit against the US government and fossil fuel companies on the grounds of neglecting what scientists (including the companies' own) had been saying for years: that something must be done.

The scenario continues:

> "A social reaction to the use of fossil fuels grows, and individuals become 'vigilante environmentalists' in the same way, a generation earlier, they had become fiercely anti-tobacco. Direct-action campaigns against companies escalate. Young consumers, especially, demand action." (Royal Dutch Shell Group 1998)

The timing of this Shell report is notable. State health care cost–recovery lawsuits against the tobacco industry had gathered momentum from 1994 onward. That litigation came to a head in 1998 with the Master Settlement Agreement among the four largest US tobacco companies and the attorneys general of 52 states and territories (Public Health Law Center 2019). It seems Shell was acutely aware of the threat of legal accountability for the harms caused by its products.

Shell's assessments, much like Exxon's 1982 primer, were widely distributed within the company but not distributed externally. With its eerily prophetic 1998 scenario, Shell accurately forecast not only climate impacts but the public's eventual outcry at the company's abdication of its responsibility to act on its extensive internal knowledge about the threat posed to people and the planet by its continued extraction and sale of climate-destroying fossil fuels. Yet, even with this internal recognition of the situation, the company did little to alter its business plan, continuing full speed ahead to extract oil and gas while working to block climate action and maintain the profitable status quo.

Abundant Documentary Evidence Is Bolstered by Insider Testimony

In recent years, former industry scientists have further corroborated the extent of fossil fuel companies' knowledge about climate change even while the companies continued to profit from the destruction they were knowingly causing. One powerful example is the 2019 testimony of Martin Hoffert, professor emeritus at New York University, before the US House of Representatives (Box 6). Hoffert, a noted physicist and prominent researcher in climate modeling who worked with Exxon Research & Engineering from 1981 to 1987, explained that the company's climate models were state of the art and closely aligned with independent academic and government models of the time.

"The quality of the scientific work done by our Exxon research group was high," Hoffert testified, adding that some of their seminal work is still cited today (Hoffert 2019). He emphasized that Exxon's research correctly predicted the warming that has occurred in the decades since. He noted that the company's scientists were fully aware that continued fossil fuel use would lead to global warming.

He also testified that, even at the time, he recognized that the company was deceiving the public:

> "I was greatly distressed by the climate science denial campaign that Exxon's front office launched around the time I stopped working as a consultant for Exxon. The advertisements that Exxon ran in major newspapers raising doubts about climate change were contradicted by the scientific work we had done and continued to do. *Exxon was publicly promoting views that its own scientists knew were wrong. This was immoral and has greatly set back efforts to address climate change.*" (Hoffert 2019; emphasis added)

Emerging steadily over the past decades, the accumulated evidence of fossil fuel companies' awareness of climate science is a slam dunk. With their early recognition of climate risks in the 1950s and comprehensive analyses presented in the following decades, the industry possessed a clear understanding of the consequences of its products and operations.

Box 6. Testimony by Martin Hoffert Before the US House of Representatives, 2019

Martin Hoffert, a noted physicist and prominent researcher in climate modeling who worked with Exxon's Research & Engineering division from 1981 to 1987, testified before the US House of Representatives in 2019. He stated that the company's climate models were state of the art and closely aligned with independent academic and government models of the time. He noted that the findings of Exxon's scientists were contradicted by the company's public statements about climate change.

"I was greatly distressed by the climate science denial campaign that Exxon's front office launched around the time I stopped working as a consultant for Exxon. . . . *Exxon was publicly promoting views that its own scientists knew were wrong. This was immoral and has greatly set back efforts to address climate change* [emphasis added]."

(Hoffert 2019; read the testimony at https://oversightdemocrats.house.gov/sites/evo-subsites/democrats-oversight.house.gov/files/MIH%20Written%20Testimony.pdf.)

The evidence compiled to date amply demonstrates that fossil fuel companies were well aware of the implications of climate science. And with numerous lawsuits now in or entering the phase of legal discovery, in which plaintiffs can demand access to internal company documents, further compelling evidence is likely to emerge.

The late 1980s and early 1990s marked the turning point at which the public and policymakers began to recognize and discuss climate change more widely. For instance, in 1988, James Hansen, a National Aeronautics Space Administration scientist, asserted at a US congressional hearing that global warming was already occurring and that he could make the assertion "with 99% confidence." His testimony drew a banner front-page headline in *The New York Times* (Shabecoff 1988).

The same year, the United Nations formed the Intergovernmental Panel on Climate Change (IPCC), a team of scientists selected by member states to study the causes and impacts of climate change. Their work would lead to the United Nations Framework Convention on Climate Change (UNFCCC), under which 154 countries committed to addressing the issue. Also that year, members of the US Congress introduced the National Energy Policy Act of 1988, which intended to "establish a national energy policy that will quickly reduce the generation of carbon dioxide and [other] trace gases as quickly as is feasible in order to slow the pace and degree of atmospheric warming . . . to protect the global environment" (Frumhoff, Heede, and Oreskes 2015).

As the next chapter details, this period coincides with an increase in companies' organized efforts to undermine scientific consensus about climate change and to actively work to block climate action. Despite the evidence of clear warnings from scientists—both within and outside the companies—major fossil fuel corporations sought to mislead the public about the need for climate action, with dire consequences for us all.

Chapter 2
What Fossil Fuel Companies Did Instead of Addressing Climate Change and Working Toward Needed Carbon Emissions Reductions

The previously presented documents offer a small sampling of the wealth of evidence that has emerged in recent years documenting how much the fossil fuel companies knew about climate science and the severity of the impacts their products were causing to the planet.

Of equal import, however, is the documentary evidence revealing how major fossil fuel companies responded to the information they possessed about the dangers of climate change. A company possessing such alarming information about the dangers of its products should have alerted the public, government, and its shareholders about what its scientists had found and actively worked to alter its business plans, promote renewable sources of energy, and reduce carbon emissions.

Instead, major oil companies embarked on a campaign of deception, diversion, and delay to try to foil government and public demands for change, often colluding with each other to do so. Many of the tactics they used—often following the playbook of the tobacco industry—are still being deployed today.

Fossil Fuel Companies Launched a Coordinated Campaign of Deception and Disinformation About Climate Science

Among the starkest and most damning documents outlining a collusive fossil fuel company deception campaign is a 1998 memo written by a team convened by the API. The nine-page strategy document, sometimes referred to as the API "Roadmap" memo, was leaked by an industry official to the National Environmental Trust, a nonprofit cited in the memo as championing media education on the science of climate change. The Trust gave the memo to *The New York Times*, which published a story about the campaign (Cushman 1998). (UCS published the memo in its entirety in 2015; it is available at https://www.ucs.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-2_API-Climate-Science-Communications-Plan.pdf.)

The exposure of the memo in draft form interrupted the effort and led industry representatives to emphasize that the plans were not formally approved by participating organizations. Representatives for companies including Chevron, Exxon, and Southern Company acknowledged their involvement to the *Times* (Cushman 1998). Several conservative and libertarian organizations involved with the road map—for example, the American

Legislative Exchange Council (ALEC), Competitive Enterprise Institute, and Committee for a Constructive Tomorrow—received funding from Exxon through its foundation and corporate grant-making program (Negin 2020).

The draft "Roadmap" explicitly and cynically outlined a goal for the companies to try to increase uncertainty among the public and policymakers about the realities of climate science. It also laid out plans to undermine the recently signed 1997 Kyoto Protocol, an international agreement under the UNFCCC that broke new ground by setting binding targets for reducing nations' carbon emissions. The action plan plainly stated:

> "Victory will be achieved when:
>
> "--Average citizens 'understand' (recognize) uncertainties in climate science; recognition of uncertainties becomes part of the 'conventional wisdom.'
>
> "--Media 'understands' (recognizes) uncertainties in climate science . . . and those promoting the Kyoto treaty on the basis of extant science appear to be out of touch with reality. (Walker 1998)

To accomplish these goals, the memo outlines a multifaceted deception strategy for the fossil fuel industry, including a plan akin to one previously used by the tobacco industry. The idea was for companies to "identify, recruit, and train" a team of five seemingly independent scientists whose research would be promoted to confuse the public by accentuating "uncertainties" in climate science—even though a scientific consensus existed that climate change was real, driven by the burning of fossil fuels and other human behavior, and dangerous for all species (Walker 1998). The strategy was a major factor in the United States's failure to ratify the Kyoto Protocol, undermining the treaty's ultimate impact (Bassetti 2022).

UCS has worked for nearly two decades to expose and document these companies' deception campaigns. The organization's 2007 report *Smoke, Mirrors, and Hot Air* (cited in many of the current lawsuits against fossil fuel companies) detailed how ExxonMobil used its corporate giving program to divert millions of dollars into front groups with often scientific-sounding names. These groups were established to publish cherry-picked science and disinformation—sometimes even going so far as to mimic the style of actual peer-reviewed scientific studies. The report showed that through this effort, ExxonMobil was able to promote the work of several early career scientists who were specifically selected to confuse the public by undermining the scientific consensus about climate science—precisely following the plan that had been outlined in the API "Roadmap."

A prime example of the plan in action is the fossil fuel industry's efforts to promote the work of a scientist named Wei-Hock "Willie" Soon, who specializes in studying sunspots and solar variation. These topics have little to do with the actual cause of climate change. However, front groups bankrolled by ExxonMobil and other fossil fuel interests worked to amplify Soon's findings to try to increase the sense that scientists were uncertain about what was causing climate change.

As documented in the 2015 UCS report *The Climate Deception Dossiers*, Soon's research papers identified his affiliation with the prestigious Harvard & Smithsonian Center for Astrophysics but never acknowledged his clandestine funding from fossil fuel companies. That came to light only after a Freedom of Information Act request by Greenpeace and the Climate Investigations

Center uncovered documents showing that the Harvard & Smithsonian Center for Astrophysics had signed an agreement to hide the fact that Soon had received more than $1.2 million in research funding from the industry.

Between 2001 and 2012, Soon's research was directly funded by fossil fuel interests, including ExxonMobil, the API, Southern Company, and Koch foundations. The Harvard & Smithsonian Center for Astrophysics clandestine agreement included the unorthodox provision that ExxonMobil would have the right to review all of Soon's work prior to any peer-review publication (Preston 2010).

The UCS report *The Climate Deception Dossiers* tells the detailed story of the fossil fuel industry's deception campaign through a collection of some 85 internal company and trade association documents. The documents were leaked to the public, brought to light through lawsuits, or disclosed through Freedom of Information Act requests. In the decade since the release of that report, the evidence—both of internal fossil fuel company knowledge of climate science and of the industry's climate deception—has strengthened substantially.

As reporters, activists, and scholars have pored over corporate archives, much new evidence has come to light. A grim example of fossil fuel deception can be seen, for instance, in a fall 1996 Exxon public relations (PR) pamphlet published by Kert Davies, now director of special investigations at the Center of Climate Integrity (Box 7). In it, Exxon CEO Lee Raymond writes:

> "Proponents of the global warming theory say that higher levels of greenhouse gases—especially carbon dioxide—are causing world temperatures to rise and that burning fossil fuels is the reason. *Yet scientific evidence remains inconclusive as to whether human activities affect global climate*." (Raymond 1996; emphasis added)

In this passage, Exxon's top executive personally dispenses disinformation with an outright denial of the near unanimous scientific consensus about the reality of climate change being driven by the burning of fossil fuels. As this report shows, for well over a decade prior to this public statement, Raymond and other top executives had been fully and accurately briefed by Exxon's own scientists about the role of fossil fuel emissions in global climate change.

Box 7. *Global Warming: Who's Right*, by Exxon CEO Lee Raymond, 1996

A clear example of fossil fuel company duplicity can be seen in a fall 1996 Exxon PR pamphlet.

"Proponents of the global warming theory say that higher levels of greenhouse gases—especially carbon dioxide—are causing world temperatures to rise and that burning fossil fuels is the reason," Exxon CEO Lee Raymond writes in the pamphlet's lead essay. "*Yet scientific evidence remains inconclusive as to whether human activities affect global climate* [emphasis added]."

In this passage, Exxon's top executive blatantly denies the near unanimous scientific consensus about the reality of climate change. He and other executives had been fully and accurately briefed about the realities of climate science by Exxon's own scientists for well over a decade.

(Raymond 1996; read the pamphlet at https://climateintegrity.org/uploads/deception/1996-Exxon-Global-Warming-Whos-Right.pdf.)

Fossil Fuel Companies Developed—and Continue to Carry Out—Highly Deceptive Public Relations and Lobbying Campaigns to Stall Climate Action

Manipulating public opinion is vitally important to an industry with as much direct impact on our world as the oil and gas industry. Fossil fuel companies deploy PR firms—which often provide both advertising and lobbying services—as field marshals in the industry's battle for influence. Major fossil fuel companies engage these firms to valorize the industry and distract the public from the industry's efforts to maintain its power over market and policy outcomes. Such efforts are often at odds with its public messaging.

A core tactic in this battle is disinformation—that is, the intentional spread of false information. Disinformation is then repeated by the public, thereby becoming misinformation, or incorrect information spread through ignorance or error (UCS 2022).

A 2022 investigation by the US House of Representatives Committee on Natural Resources corroborated this conclusion. It found that the fossil fuel industry was using PR to effectively spread climate disinformation by promoting a positive image of oil and gas companies, weaponizing third parties, and delegitimizing opponents.

> "By portraying themselves or their products as more environmentally friendly than they are, fossil fuel companies can maintain their social license to operate even in the face of strong political headwinds and scientific consensus about the need to reduce fossil fuel emissions." (US Congress HCNR 2022)

According to figures compiled by OpenSecrets, a nonpartisan nonprofit that tracks money in politics, the fossil fuel industry spends upward of $100 million per year to lobby the federal government directly (OpenSecrets, n.d.). On top of this enormous sum, fossil fuel companies also spend millions of dollars each year on PR and advertising, services that—unlike federal

lobbying—do not legally require disclosure. Fossil fuel industry trade associations alone spent more than $1.4 billion on PR and advertising between 2008 and 2018. Nearly half of that came from API (Climate Investigations Center 2018).

A report assessing international companies' and trade associations' climate policy engagement ranked US companies Chevron and ExxonMobil and trade associations API and the American Fuel & Petrochemical Manufacturers most negatively influential for their efforts to block policies aligned with the 2015 Paris Climate Agreement (InfluenceMap 2021). The agreement, negotiated under the UNFCCC, established the goals of keeping the global average temperature increase to well below 2°C and striving to limit it to 1.5°C above preindustrial levels (UNFCCC, n.d.).

The fossil fuel industry's deceptive PR and lobbying strategies were described with ringing clarity in 2021 by an ExxonMobil lobbyist who unknowingly confessed his company's ongoing tactics to undercover reporters (Box 8). In an infamous and shockingly candid interview secretly recorded by investigators with Unearthed (Greenpeace UK's investigative platform), who posed as headhunters, Keith McCoy, then ExxonMobil's senior director of government affairs, admitted that the company used front groups as part of its "fight" against climate science (Carter 2021).

> "Did we aggressively fight against some of the science? Yes," said McCoy during the 90-minute interview. "Did we join some of these shadow groups to work against some of the early efforts? Yes, that's true. . . . We were looking out for our investments, we were looking out for our shareholders" (Carter 2021).

Box 8. Interview with Keith McCoy, Former ExxonMobil Senior Director of Government Affairs, 2021

In an infamous and shockingly candid interview secretly recorded by investigators posing as headhunters, Keith McCoy, then Exxon's senior director of government affairs, admitted that ExxonMobil used front groups as part of its "fight" against climate science.

McCoy admitted that ExxonMobil "aggressively" fought climate science using front groups. He also revealed that ExxonMobil's public support for a carbon tax was simply an "advocacy tool" and "great talking point," because no one in the company believed such a tax would ever pass the US Congress.

(Carter 2021; read about the interview at https://unearthed.greenpeace.org/2021/06/30/exxon-climate-change-undercover/.)

McCoy also articulated the role trade associations play, promoting industry messages while functioning as shock absorbers. This arrangement is well documented in a 2024 Joint Congressional Committee staff report examining the mechanisms the fossil fuel industry uses to evade accountability for climate change (HCOA and SCOB 2024).

Emails obtained by staff investigators show how companies leverage trade associations such as API to push policy goals and lobby for unpopular proposals with which companies do not want to be associated. "We don't want it to be us—to have these conversations, especially in a

hearing," said McCoy. "It's getting our associations to come in and have those conversations and answer those tough questions and be, for lack of a better term, a whipping boy for some of those members of Congress" (Channel 4 News 2021).

McCoy also explained the duplicity of ExxonMobil's position on taxing carbon emissions. The carbon tax idea had floated around Washington, DC, for years, only to die on Capitol Hill—largely as the result of lobbying by the fossil fuel industry (Nanko and Coan 2024).

McCoy said ExxonMobil's public support for a carbon tax was simply an "advocacy tool" and "great talking point." He explained that ExxonMobil and API adopted the position only after determining it would never actually happen. As he put it: "It gives us a talking point to say, what is ExxonMobil for? Well, we're for a carbon tax" (Carter 2021).

The 2021 McCoy interview laid bare what those who closely watch the oil and gas industry have known for years: The industry has mastered the art of paying lip service to climate action when speaking to the public and policymakers and works behind the scenes to delay and block measures that would limit climate damage and curb industry profits.

McCoy paid for breaking the industry's code of silence about their tactics. ExxonMobil dropped him shortly after the interview became public (Hiar 2021).

Fossil Fuel Companies Knowingly Deploy Greenwashing and Disinformation Campaigns to Distract and Confuse the Public

One of the key tactics fossil fuel companies use to confuse the public is to play on concerns about climate change by making empty, environmentally friendly sounding claims and using phrases linked to sustainability. This tactic has become common enough in recent years to earn its own term: "greenwashing."

Greenwashing can take many forms, such as highlighting a company's minor investment in a renewable energy project as a major achievement or labeling its products as "clean" without evidence to back up the claim (Aronczyk, McCurdy, and Russill 2024). Greenwashing claims and campaigns project to the public a corporate image of fostering positive environmental outcomes, even while the companies continue to profit from the unabated extraction of fossil fuels or other destructive business practices.

The practice has become pervasive enough for several countries to guard against it in their consumer protection regulations, and fossil fuel companies have frequently run afoul of those rules. For example, a German court ruled in 2024 that BP misled customers by branding its motor oil and lubricants "climate neutral" and "certified carbon neutral" based on carbon emissions certificates BP had purchased. The certificates turned out to be of dubious quality, thus rendering the claims incorrect and violating the German Act Against Unfair Competition (Deutsche Umwelthilfe 2024).

BP may have been forced to rebrand its motor oil, but ExxonMobil embarked on a much more expensive greenwashing exercise with little adverse consequence to the company. In 2008, it announced the launch of a research program that aimed to create biofuels from algae. The goal was to use fatty acids in the plant to create an oil that could power ships and planes. From 2009 to 2023, ExxonMobil spent nearly $175 million to advertise the program, making it a

cornerstone of a key advertising campaign. During that same period, however, the company reportedly spent only $350 million on the project itself—less than half what its own experts said was necessary to get such a project off the ground—before ending it in 2023 (Westervelt 2023).

Internal corporate communications subpoenaed by Congress in 2021 show that ExxonMobil executives were aware that they were failing to invest sufficiently to make algae biofuels commercially viable, even while they were actively promoting the program in an advertisement campaign (US Congress 2024a). An internal ExxonMobil document, *Algae Biofuels Program Talking Points*, explicitly states that the investment in algae biofuels was potentially prohibitively expensive: "ExxonMobil's analysis has concluded that final development and broad deployment of algae-based biofuels by the company would require future investments of billions of dollars" (Box 9).

This dissonance created communication problems for the company as well. Another internal document obtained by Congress shows that ExxonMobil CEO Darren Woods requested his speechwriters include the algae research in a talk he planned to give at a 2017 energy conference as an example of "relevant climate related technology." However, the speechwriters did not believe the algae research supported the speech's argument about the compatibility of oil and gas production with environmental "progress" (US Congress 2024c).

The company's capital expenditures during this period highlight how misleading ExxonMobil's promotion of its fledgling algae program was. Though its advertisements made it sound as if ExxonMobil was working hard to find more environmentally friendly energy solutions, the company's capital expenditures between 2009 and 2022 totaled more than $400 billion, based on annual reports filed with the government (SEC, n.d.). That means the company's spending on algae biofuels amounted to less than 1 percent of its total investments in infrastructure, equipment, and technology—the vast majority of which still go to expanding oil and gas production.

Box 9. Internal ExxonMobil Talking Points on Algae Biofuels, 2009

In 2008, ExxonMobil announced the launch of a research program to create biofuels from algae. From 2009 to 2023, ExxonMobil spent nearly $175 million to advertise the program, but reportedly invested only $350 million in the project itself—less than half what its own experts said was necessary to get such a project off the ground—before ending it in 2023.

Internal corporate communications subpoenaed by Congress in 2021 show ExxonMobil executives were aware that they were failing to invest sufficiently to make algae biofuels commercially viable, even while they were actively promoting the program in an advertisement campaign.

An internal ExxonMobil document titled Algae Biofuels Program Talking Points explicitly states that the investment in algae biofuels was potentially prohibitive: "ExxonMobil's analysis has concluded that final development and broad deployment of algae-based biofuels by the company would require future investments of billions of dollars."

(US Congress 2024a; read the talking points at https://journaliststudio.google.com/pinpoint/document-view?collection=50a90caf6871715e&p=45&docid=9bdb00529ee38a6d_50a90caf6871715e&page=4.)

Fossil Fuel Companies Use Front Groups to Disseminate Disinformation and Sway Public Opinion

Although ExxonMobil lobbyist McCoy spoke of shadow groups—organizations created or controlled by companies to push industry agendas—as a thing of the past, they continue to play a major role in spreading climate disinformation. These groups can take a "soft persuasion" approach (for example, creating an industry coalition to promote climate pledges that exaggerate companies' actual efforts) or a "hard persuasion" approach (for example, fabricating memberless front groups to run attack ads spouting what are, in fact, fossil fuel company talking points they dare not make themselves). Both approaches serve the same purpose: to create a screen that companies can hide behind, allowing them to say one thing while doing another (Brulle and Downie 2022).

One of the more innocuous-seeming examples of the soft persuasion approach is the Oil and Gas Climate Initiative (OGCI), founded in 2014 by leaders from major energy companies. The initiative's website says it is committed to "accelerating action towards a net zero future consistent with the Paris Agreement" (OGCI, n.d.). This group focuses on approaches such as methane emissions reductions in oil and gas operations and carbon capture, utilization, and storage—which aren't likely to play a material role in meeting 2030 targets and are not a substitute for immediate and sharp reductions in fossil fuel production.

Member fossil fuel companies find these kinds of third-party arrangements appealing. The companies can tout their association with groups such as OGCI to help make the case that they are doing something to address climate change without actually doing it. But even that level of commitment has apparently proved too much for some members—for example, when OGCI's positions threaten to commit the member companies to real climate action.

A 2019 briefing document subpoenaed by the US House Committee on Oversight and Government Reform makes this duplicity explicit. In it, an ExxonMobil executive recommends that Chair and CEO Darren Woods urge OGCI to remove any references to the Paris Climate Agreement from its documents, including public statements and an annual report. The memo states that OGCI should avoid any language that "potentially commits [OGCI] members to enhanced climate-related governance, strategy, risk management, and performance metrics and targets." The document, which describes "critical edits" ExxonMobil provided to OGCI, noted that Chevron was "generally aligned" with ExxonMobil's sentiment (US Congress 2024d).

OGCI staffers pushed back on many edits, such as one from Chevron asking to change a description of OGCI's goal of "net-zero emissions" to "emissions reduction." The staffers pointed out that the goal of achieving net-zero emissions dated to OGCI's founding—four years before ExxonMobil and Chevron joined the body (US Congress 2024e).

The hard persuasion approach includes creating advocacy groups masquerading as grassroots community initiatives, a tactic known as astroturfing. Though trade associations and lobbyists are often the motors of such groups, it is difficult for the public or policymakers to hold them accountable. Trade associations are not legally required to list their membership or boards of directors publicly.

Companies are also reluctant to disclose their memberships or discuss whether their public stance on climate change is aligned with the groups they fund. Even so, several oil and gas corporations have begun to disclose memberships, payments, and policy alignment in response to shareholder and public pressure (Hong, Miles, and Bakhshi-Azar 2022). And companies have even publicly severed ties with groups when shady influence campaigns are exposed.

A master of the astroturfing tactic is the Western States Petroleum Association (WSPA), which counts nearly every major US oil and gas producer as a member, including ExxonMobil, Chevron, and Shell's US division (Shell Oil). As detailed in the 2015 UCS *Climate Deception Dossiers* report, WSPA's reputation as an expert in astroturfing was cemented when the 2014 presentation by its president, Catherine Reheis-Boyd, was leaked to the public (WSPA 2014; Mulvey and Shulman 2015). The presentation showed WSPA's plan to attack climate-related policies, such as low-carbon fuel standards, by creating more than a dozen astroturf groups with names like California Drivers Alliance, Californians for Affordable and Reliable Energy, and Fed Up at the Pump (Mulvey and Shulman 2015).

WSPA funneled millions of dollars into billboards, radio spots, and other messaging paid for by these groups to create the impression that the public did not support climate legislation. For example, WSPA created the California Drivers Alliance in response to California's Clean Energy and Pollution Reduction Act of 2015, which would have cut the state's oil consumption by increasing electricity from renewable sources and enhancing energy efficiency, among other actions. The mysterious alliance sent full-color mailers to homes and sponsored radio spots calling the act the "California Gas Restriction Act" and falsely claiming the bill would impose a tax on minivans (Alvord 2015).

More recently, in 2023, Chevron gave more than $7 million to Citizens for Energy Independence, an astroturf group created by WSPA, to fight California initiatives that would impose a windfall tax on oil companies and create a buffer zone for oil wells. Studies have

shown that proximity to oil production facilities puts communities at a higher risk for asthma, cancer, and other chronic diseases (Williams et al. 2020). While Citizens for Energy Independence characterizes itself as a coalition of 200,000 Californians, its tax documents show the organization has only three employees: a lawyer for a firm that works on ballot initiatives, the CEO of the California Independent Petroleum Association, and WSPA's Reheis-Boyd.

One analysis found that three WSPA-funded groups—Citizens for Energy Independence, Californians Against Higher Taxes, and Californians for Affordable and Reliable Energy—spent $11 million on advertising in 2023 to falsely blame the buffer zone law for driving gas prices up in the state, among other claims (CSHC 2024).

Another expert at weaponizing disinformation is the Independent Petroleum Association of America (IPAA), a Washington, DC-based trade association established in 1929 to represent smaller oil companies. Launched in 2009 by the IPAA, the Energy in Depth website has depended on backing from fossil fuel companies, including BP, Chevron, ExxonMobil, and Shell (DeMelle 2011; Energy in Depth, n.d.a; Tabuchi 2020) (Box 10).

Energy in Depth attacks climate accountability experts while promoting false claims about oil, fossil gas, and environmental and economic issues (Energy in Depth, n.d.b). FTI Consulting, the PR agency hired to build and run Energy in Depth, said plainly in at an oil and gas trade show presentation that the value of such programs and platforms lies in their "ability to say, do and write things that individual company employees cannot and should not" (Climate Investigations Center 2019).

FTI has expertise in this area: It has run several astroturf campaigns for the fossil fuel industry in which the agency creates websites for seemingly local grassroots groups that parrot industry concerns (Tabuchi 2020). Energy in Depth does not disclose its funders, but former FTI employees have stated publicly that their client ExxonMobil also had a hand in directing it (Tabuchi 2020). ExxonMobil cut its ties with IPAA in 2022, about a year after an exposé on Energy in Depth appeared in *The New York Times* (Peterson 2024).

Box 10. Fossil Fuel Companies Underwrite Energy in Depth

Launched in 2009 by the Independent Petroleum Association of America, the Energy in Depth website has depended on backing from fossil fuel companies, including BP, Chevron, ExxonMobil, and Shell (DeMelle 2011; Energy in Depth, n.d.a; Tabuchi 2020). Energy in Depth attacks climate accountability experts while promoting false claims about oil, fossil gas, and environmental and economic issues (Energy in Depth, n.d.b).

FTI Consulting, the public relations agency hired to help run Energy in Depth, said plainly at an oil and gas trade show presentation that the value of such programs and platforms lies in their "ability to say, do and write things that individual company employees cannot and should not" (Climate Investigations Center 2019). Former FTI employees have stated publicly that their client ExxonMobil had a hand in directing the site (Tabuchi 2020).

(Tucker and Heeren 2014); read the presentation at https://www.documentcloud.org/documents/6571135-FTI-Consulting-and-Energy-in-Depth/.)

A 2019 memo obtained by congressional investigators lays out unequivocally how oil companies use groups like WSPA to drive policy outcomes. The memo describes a strategy for neutralizing public and political opposition to BP's Cherry Point refinery in Whatcom County, in the northernmost regions of Washington state. BP had already given WSPA hundreds of thousands of dollars for an ultimately unsuccessful campaign to fight a county bill that would have required the refinery to reduce emissions and limit expansion (Streett 2019).

In response, BP staffers proposed a "robust program of external education, community engagement, political influence and advocacy" to reduce local opposition to Cherry Point (US Congress 2024b). The program included the hard persuasion tactic of creating a social media identity for the refinery. As the memo explicitly states, the plan would "allow BP CHP to be a proactive participant in the social media portfolio—both as a provider of content and as an appropriate supplier of information to platforms that create disinformation about Cherry Point." Whether the "disinformation" BP refers to came from refinery critics or the WSPA-created "social media identity" is open to interpretation, but BP left WSPA in 2020 after some of the group's most egregious lobbying and PR tactics were publicly exposed and challenged, including by company shareholders (Bush and Bernton 2020; Mulvey 2018).

Fossil Fuel Companies Have Opened a New Front to Shut Down Disclosure of the Role of Climate Change in Financial Markets

A relatively recent tactic in the war against climate action is a push by fossil fuel companies to obstruct financial regulation and shareholder actions aimed at addressing climate-related financial risk. The industry ramped up this strategy in 2021. That year, shareholders replaced three members of ExxonMobil's board with directors nominated by an activist hedge fund, and they passed a resolution urging Chevron to cut its global warming emissions (Dunn 2021; McGowan 2021). The response was swift: Within months, a campaign sponsored by fossil fuel companies and their allies intensified to try to prevent businesses, investors, and regulators

from recognizing climate risk as financial risk (Elbein 2023). Climate change and severe climate events pose obvious financial risks to fossil fuel companies.

The campaign focused on rebranding environmental, social, and governance (ESG) investing as "woke capitalism". It included the launch of a legislative attack against companies that made pledges to reduce their global warming emissions, unsubstantiated accusations that shareholder advocates and sustainability investors were colluding against the oil and gas industry, and an effort to legally obstruct regulations requiring companies to disclose their global warming emissions and other data about their exposure to climate-related risk. The campaign was launched and driven by organizations with strong ties to the fossil fuel industry.

One such organization is ALEC, a lobby group backed by corporations and right-wing donors that produces model legislation for advocacy at the state and local levels. ALEC's corporate task force membership has included leaders from ExxonMobil, BP America, and Shell as top-tier funders (SourceWatch, n.d.). While all of those companies have left ALEC, Chevron included ALEC on its most recent list of trade association memberships (Cama 2018; Chevron 2022a; Chevron 2023).

In 2021, ALEC circulated so-called model legislative text intended for bills to be proposed in state legislatures. The proposed legislation would actually prevent state governments—including public employee pension funds—from doing business with companies or financial firms that had reputedly divested from fossil fuel companies (CMD, n.d.).

The fossil fuel industry has long fought regulations that protect investors' rights to raise issues with company leadership by filing shareholder resolutions. The anti-ESG campaign has given these companies a newfound opportunity to try to further suppress investors who attempt to hold companies accountable for the impact of their products and services on climate. In 2024, ExxonMobil even took the extreme measure of filing suit against two investor groups that filed resolutions asking for deeper global warming emissions reductions, refusing to drop the suit even after the shareholders withdrew their proposal (Mulvey 2024). By taking the case to a friendly Texas court instead of appealing through the US Securities and Exchange Commission (SEC), ExxonMobil created a chilling effect on investor initiatives, even though the case was ultimately dismissed (Smith 2024; As You Sow 2024).

Fossil fuel companies have also used trade associations as proxies in their anti-ESG crusade. In March 2024, the SEC finalized a regulation that would compel publicly traded companies to assess and report on how climate change will affect their bottom lines and, by extension, investors and the public. The fossil fuel industry and its allies lobbied against the rule, weakening the final version to the point that companies are essentially allowed to decide what climate-related risks they disclose to investors (Ellfeldt 2024).

Nevertheless, fossil fuel industry proxies immediately filed lawsuits against the rule. The Republican Attorneys General Association filed one of the suits. It is supported by several fossil fuel companies and trade associations, including ExxonMobil, Chevron, and API. The US Chamber of Commerce filed another suit. That business advocacy association is so intertwined with the distribution of climate disinformation that it was among the subjects of the 2024 congressional investigation and was called out for refusing to produce material responsive to a subpoena (HCOA and SCOB 2024). Shortly after President Donald Trump's inauguration, the

SEC asked the court to pause the lawsuits, and in March 2025 the commission voted to withdraw its defense altogether (Johnson 2025).

The oil and gas industry—a heavy donor to Trump's presidential campaign—has benefited from the new administration (Frazin and Giorno 2024). A policy document from the American Exploration & Production Council (an oil and gas trade association that counts virtually all major US oil and gas corporations as members) specifically names the SEC rule and a related executive order on climate-related financial risk as targets for revocation (Box 11). Trump revoked the Order on his first day in office, and ExxonMobil announced its withdrawal from the group soon after the document was leaked to the press (ExxonMobil 2023a; Office of the US President 2025b).

Box 11. Fossil Fuel Trade Association Briefing Book, 2024

A new tactic in fossil fuel companies' war against climate action is its effort to obstruct financial policies and shareholder actions aimed at curbing climate-related financial risks. Ramped up in 2021, the effort seeks to stop companies, investors, and regulators from recognizing climate risk as financial risk.

The campaign attempts to rebrand environmental, social, and governance (ESG) investing as "woke capitalism" and has launched legislative attacks against companies that have made ESG pledges, attacked shareholder advocates and sustainability investors by accusing them of colluding against the oil and gas industry, and fought regulations to compel companies to disclose their carbon emissions and other information that indicates company exposure to climate-related risk (Noor 2023).

A policy briefing book created by the American Exploration & Production Council, a trade association founded in 2000, targeted for elimination the US Securities and Exchange Commission climate disclosure regulation and an executive order on climate-related financial risk.

(AXPC 2024; read briefing book at https://www.documentcloud.org/documents/25196783-axpc-board-book-aug-9-2024/.)

Fossil Fuel Interests Target Opponents with Intimidation Campaigns Including Evidence of Hacking Opponents' Emails

As previously noted, much evidence has surfaced about the tactics to which fossil fuel companies have resorted to distort the facts, intimidate their opponents, and block climate action that might hurt their bottom lines.

One still-developing criminal conspiracy case seems to take such underhanded activities to new heights, however. The alleged scheme involved hacking into the email accounts of staff members at UCS and several other public interest organizations, all of whom were working to hold fossil fuel companies accountable for their role in climate change. Court documents and related reporting suggest that the US government possesses evidence that the criminal scheme was indirectly paid for by ExxonMobil and that one of its lobbying firms, the Washington, DC-based DCI Group, provided a list of "targets" to a middleman linked to the hackers and sent

the fruits of the hacking to the oil and gas company. The hacking, occurring between 2015 and 2018, targeted at least 128 individuals.

One of the hackers who carried out this scheme, Aviram Azari, an Israeli private detective, was arrested in 2019 and pleaded guilty in US district court in 2023 to three counts: conspiracy to commit computer hacking, wire fraud, and aggravated identity theft. According to the US government's sentencing memo, clients of Azari's firm paid him approximately $4.8 million from November 2014 through his arrest in September 2019 for managing intelligence-gathering and multiple hacking campaigns (including the attack on UCS) (United States District Court, Southern District of New York 2023). Azari was sentenced to over six years in prison for his part in the conspiracy but was released from prison on January 3, 2025, after serving only a portion of his sentence.

More recently, however, a court filing in Britain has revealed critical new allegations about the hacking scheme and who was behind it. A US government filing in Britain's Westminster Magistrates' Court requested the extradition from Britain to the United States of another Israeli citizen named Amit Forlit, who is being held in custody in London (United States District Court, Southern District of New York 2025b). Forlit's hearing in British court began on January 22, 2025, and continued with court dates in early February, early March, and on April 30, 2025, when the extradition was granted (John 2025).

The filing reveals that a multiyear investigation by the US Department of Justice and conducted by the Federal Bureau of Investigation led to a sealed grand jury indictment of Forlit for his alleged involvement in several criminal hacking schemes, as well as a US warrant for his arrest. To support the government's case that Forlit should be extradited to the United States to face trial, the document publicly reveals many new details about the hacking scheme alleged by the US government. According to court filings and related reporting, the US government's allegations include:

- Forlit's clients included a consulting firm in Washington, DC, later identified by Forlit's attorney in a court filing as the DCI Group, which has a long history of working for ExxonMobil (United States District Court, Southern District of New York 2025b). (ExxonMobil reportedly ended its contract with the DCI Group in 2020. This was after the hacking investigation became public [Matthews, Strasburg, and Hope 2024]).

- The DC-based lobbying group paid Forlit's multiple firms a total of $16 million between 2013 and 2018 (United States District Court, Southern District of New York 2025b).

- For one of its projects, the DC-based lobbying group "acted on behalf of one of the world's largest oil and gas corporations, centred in Irving, Texas, in relation to ongoing climate change litigation being brought against it" (United States District Court, Southern District of New York 2025b). Forlit's attorney stated in a January filing that the corporation in question is ExxonMobil (United States District Court, Southern District of New York 2025a).

Both ExxonMobil and the DCI Group have so far publicly denied involvement in the hacking scheme. At the time of Azari's sentencing, an ExxonMobil spokesperson said that the company "has no knowledge of Azari, had no involvement in any hacking activities and has not been accused of any wrongdoing" (Matthews 2023). In subsequent media reports, ExxonMobil has

said it "has not been involved in or aware of any hacking activities," while DCI Group has said: "We direct all our employees and consultants to comply with the law" (Satter and Bing 2024).

But the US government's recent filing suggests it is in possession of evidence to the contrary against DCI Group. According to the extradition filing, the US government's evidence includes:

> "(i) dozens of email accounts, including four used by [Forlit], obtained via judicially authorised search warrants; (ii) financial and business records; (iii) the product of the searches of Azari's two mobile telephones." (United States District Court, Southern District of New York 2025b)

The extradition filing claims that the US government possesses evidence that Forlit met in person with the DC-based lobbying group (which, per Forlit's attorney, is DCI Group), that the perpetrators referred to the hacking scheme as "Operation Fox Hunt," and that it included at least 128 individual hacking targets (United States District Court, Southern District of New York 2025b).

The extradition filing claims that the US government possesses email evidence of a November 2015 memo between "the D.C. Lobbying Group" (revealed as the DCI Group) and "the oil and gas corporation" (revealed as ExxonMobil), forwarded by the group's managing partner to Forlit. The memo explicitly refers to "going on the offense" after what it calls "attacks" on the oil and gas corporation "over climate change" (United States District Court, Southern District of New York 2025b). According to the filing, this November 2015 memo specifically references some of the victims of the hacking that would subsequently take place. The filing also alleges the US government has a record of the lobbying firm's payments Forlit received for the job, which he deposited into US bank accounts controlled by him and his companies.

Furthermore, the filing states that prosecutors possess evidence that hacked materials were subsequently published: "From early 2016, shortly after the hacking, emails show the D.C. Lobbying Group sent the fruits of the hacking to the oil and gas corporation and it was published" (United States District Court, Southern District of New York 2025b). The US government's sentencing memo for Azari stated that the published articles about the stolen and leaked documents appeared designed to undermine the integrity of investigations by state attorneys general into ExxonMobil or of individual victims of the hacking scheme, and were incorporated into ExxonMobil's court filings litigating against the state investigations (United States District Court, Southern District of New York 2023). According to reporting by Reuters and NPR, DCI Group allegedly shared some of the stolen material with ExxonMobil before leaking it to the media, and an executive at the DC-based lobbying group is also alleged to have emailed a published article featuring a private memo belonging to an environmental lawyer to colleagues with the subject line "BOOM" (Satter and Bing 2024; Copley 2025).

As the filing concludes, its "summary of the evidence provided by the USA, taken with the financial records, presents a compelling case" for Forlit's extradition. The evidence was sufficient to have convinced a New York grand jury in 2022 to indict Forlit on three counts, including conspiracy to commit computer hacking, conspiracy to commit wire fraud, and wire fraud. It was also sufficient for the US District Court for the Southern District of New York to find probable cause to issue a warrant for Forlit's arrest. The maximum sentences Forlit would face if found guilty are 5, 20, and 20 years' imprisonment, respectively.

Much was previously known about the hacking scheme, thanks in part to the work of the Citizen Lab, a Canadian cybersecurity group based at the Munk School of Global Affairs & Public Policy at the University of Toronto. The group issued a detailed report on the case in 2020, calling it a "massive hack-for-hire operation" (Scott-Railton et al 2020).

By identifying several telltale "cyber fingerprints," the Citizen Lab determined with high confidence that the hackers had, between 2015 and 2018, attempted to infiltrate the email accounts of key staff members of at least 10 nonprofits, including UCS, 350.org, the Climate Investigations Center, Greenpeace, and the Rockefeller Family Fund. Notably, all of these groups are involved in work aiming to hold ExxonMobil and other major fossil fuel companies accountable for their deception about climate science and their efforts to block climate action.

Between 2015 and 2018, several senior staff members at UCS had their email accounts hacked through a sophisticated phishing campaign that indicated the perpetrator had a good deal of knowledge about these individuals' interests and contacts. After conducting an internal investigation, UCS found that, while no fundraising files or member or donor accounts had been breached, the perpetrators nevertheless had likely gained access to sensitive UCS emails and strategic planning documents.

It was also previously known, from court testimony and documents in Azari's case, that he was paid to orchestrate the cyber espionage, that he contracted with a hacking group in India to carry it out, and that the hackers in India emailed him to say they had successfully infiltrated the targets. Azari pled guilty to facts that he undertook espionage campaigns under contract from corporate clients in Europe and the United States (Copley and Brady 2023).

Box 12. The "Operation Fox Hunt" Hacking Scheme

Court documents have revealed previously undisclosed allegations by the US government regarding the genesis of a coordinated scheme to hack into the email accounts of staff members at UCS and other public interest organizations working to hold fossil fuel companies accountable for their role in climate change.

The court filing alleges that the US government possesses evidence that a "D.C. Lobbying Firm" (likely referring to longtime ExxonMobil lobbyist the DCI Group) paid a middleman at least $16 million between 2013 and 2018, that co-conspirators referred to one of multiple hacking schemes as "Operation Fox Hunt," and that this scheme included at least 128 individual targets. The US government also claims to possess email evidence linking "one of the world's largest oil and gas corporations, centred in Irving, Texas" (likely referring to ExxonMobil, which was previously headquartered there) to what the government calls "the fruits of the hacking" scheme.

(United States District Court, Southern District of New York 2025b; read the US government filing at https://legacy.www.documentcloud.org/documents/25501845-250113-usa-v-forlit/.)

As previously mentioned, those in the hacking scheme's list of targets were also involved in work at nonprofit groups to hold ExxonMobil and other fossil fuel companies accountable. The cyberattacks occurred at a key moment, when pressure was building against ExxonMobil in particular. For example, when UCS email accounts were infiltrated in 2017, then-New York Attorney General Eric Schneiderman was preparing to file a lawsuit against ExxonMobil for deceiving its shareholders about the realities of climate change. At the time, other attorneys general across the country were considering lawsuits as well, and UCS was in contact with some of their offices, providing information about specific examples of climate deception.

During the period noted in the legal filing, the previously mentioned fossil fuel industry–backed news site Energy in Depth published disinformation citing former UCS Science and Policy Director Peter Frumhoff by name and spuriously accusing him and the organization of having "conspired" against ExxonMobil. The site even quoted language from Frumhoff's work-related emails (Energy in Depth 2017).

An excerpt from a private email sent to Lee Wasserman, director of the Rockefeller Family Fund, similarly found its way into an article from *The Wall Street Journal.* That article subsequently was published by the right-wing *Washington Beacon* newspaper, Energy in Depth, and later on ExxonMobil's website, on a dedicated page about the #ExxonKnew allegations that has since been taken down. Wasserman recently told *The Wall Street Journal* that ExxonMobil used his private emails to try to "develop a convoluted and completely false story" of a conspiracy against the company. He likened ExxonMobil's effort to "arsonists trying to pin blame on the firefighters" (Matthews 2023). The same stolen document was submitted as evidence of the "conspiracy" against ExxonMobil in court proceedings in New York state, Massachusetts, and other venues (Copley and Brady 2023).

Until now we haven't seen public court evidence linking ExxonMobil and its then-lobbying firm, the DCI Group, to the hacking conspiracy.

Conclusion
Preserving Access to Justice and Ratcheting Up Climate Accountability

Today, one in four people in the United States live in a state, territory, or municipality that is taking major fossil fuel corporations to court to hold them accountable for climate deception and the massive resulting harms. Lawsuits against major fossil fuel corporations are also advancing in courts around the world. Separately, a growing number of US state legislatures are considering so-called climate superfund laws, which would require the corporations responsible for the most heat-trapping emissions to help pay for the growing costs to protect public infrastructure from climate-driven damages.

Major fossil fuel corporations are desperately fighting to avoid accountability for their outsize role in driving climate change. The fossil fuel industry has fiercely attacked climate lawsuits and legislative efforts in court, delaying justice in climate litigation for years with meritless procedural hurdles and unfounded claims of preemption. ExxonMobil, other major fossil fuel corporations, and their surrogates have sought to intimidate and undermine the credibility of those working to hold them accountable. Now they may attempt to seize the opportunity presented by a friendly Congress and White House to secure immunity from liability for their deception and the massive resulting harms. A fossil fuel industry advocacy group has launched a public campaign opposing climate accountability lawsuits, and CEOs of major oil and gas corporations including Chevron and ExxonMobil reportedly met with President Trump to ask for his help fighting and climate litigation and climate superfund legislation (Morenne and Eaton 2025; Clark 2025; Joselow and Phillips 2025). In March 2025, President Trump issued an Executive Order attacking states' rights, including laws and lawsuits related to environmental justice, pollution standards, and fossil fuel industry-driven climate damages (Office of the US President 2025a).

The fossil fuel industry's shameful record, placing profits above the health of people and the planet, demands that any effort to evade accountability be stopped in its tracks.

The Past Decade: Mobilizing to Confront an Escalating Emergency

Ten years ago, in the lead-up to the adoption of the Paris Agreement, UCS published *The Climate Deception Dossiers* and launched a corporate accountability campaign focused on major investor-owned fossil fuel corporations (Mulvey and Shulman 2015). This novel idea was a natural and strategic expansion for a science advocacy organization that calls for science-informed policy and action by powerful parties, both public and private. The campaign aims to exert public pressure and undercut the social license of these major corporate contributors to climate change. (Social license refers to the corporations' acceptance and legitimacy among local communities, employees and potential employees, investors, the business community, and society at large that enables them to operate and deliver returns).

UCS's campaign focuses on providing science and expert analysis to inform strategies—such as investor action and litigation—that deter climate-damaging conduct.

From 2015 to 2025, the climate crisis intensified, necessitating a more hard-line stance toward fossil fuel corporations. While the Paris Agreement marked a critical milestone in global climate policy, the past decade has revealed the stark inadequacies of fossil fuel corporations' actions and commitments. Research by UCS and others has shown that corporations—including BP, Chevron, ExxonMobil, and Shell—have continued to obstruct climate progress while failing to meet even basic standards for transparency, accountability, and transformative action.

The rapidly shrinking carbon budget (the finite amount of CO_2 emissions that can be released while still limiting global temperature rise to 1.5°C or 2°C) narrows societal options while demanding new and stringent strategies to overcome the fossil fuel industry's bad-faith lobbying, greenwashing campaigns, and evolving corporate tactics. Key developments include increased use of litigation as a tool for accountability, the emergence of new societal and scientific expectations for corporate responsibility, advances toward mandatory corporate disclosure and due diligence requirements, and a growing movement at the intersection of environmental and climate justice.

With the federal government backsliding on climate, clean energy, and clean transportation—and apparently prepared to grant the fossil fuel industry's every wish—corporate accountability campaigning is an essential tool. In this moment, society must ratchet up what we are demanding from the fossil fuel industry based on the sobering realities of the climate crisis and lessons learned over the past decade.

While fossil fuel corporations have lost our trust as good-faith actors—through their continued emissions, expansion, delays, diversionary tactics, and calculated disinformation—they have the opportunity to regain social license through meaningful and sustained changes in their conduct. There is still potential for them to get ahead of mounting litigation and growing public awareness of their central role in blocking climate action by acknowledging and fulfilling their shared responsibility to protect our planet and its people.

A Call to Action: Pressure the Fossil Fuel Industry

In light of the evidence presented in this report, UCS is calling for a massive increase in pressure on fossil fuel corporations to fulfill their responsibilities to the global community and take meaningful steps toward a sustainable and just future. Simply put, the clock is running out and these corporations deserve to be held accountable through all lawful means for their decades of climate deception and the resulting devastating damages. The world cannot risk another 10 years of empty promises and delays. Everyone—including affected communities, experts, consumers, public prosecutors, litigators, investors, financiers, business partners, regulators, and policymakers—has a role to play and levers to pull.

First and foremost, we demand that major fossil fuel corporations do the following:

Cease disinformation and greenwashing on climate science, public policy, and corporate actions.

Major fossil fuel producers' past and ongoing efforts to deceive the public, investors, and policymakers have shifted the burden of proof. These corporations must now earn the public's trust in their climate-related statements and actions. To meet this demand, fossil fuel companies must end their greenwashing campaigns, their attempts to downplay the severity of the climate crisis, and their diversionary tactics that distract from the urgent need to phase out fossil fuels. They must admit and publicly renounce past wrongdoing and issue corrective statements similar to those required of the tobacco industry after a federal court ruling that major US tobacco corporations had violated civil racketeering laws and engaged in a decades-long conspiracy to deceive the public.

Unfortunately, because of the cumulative effects of decades of deception and delay by the fossil fuel industry, swearing off of lying is necessary but not sufficient. That's why we also insist major fossil fuel corporations take the following actions:

Stop obstructing science-informed public policy and its implementation.

Just as the tobacco industry has a fundamental and irreconcilable conflict of interest with public health policymaking (WHO FCTC 2013), the fossil fuel industry has a fundamental and irreconcilable conflict of interest with the development and implementation of public policies intended to limit fossil fuel–driven climate change and accelerate the transition to clean renewable energy.

Major fossil fuel corporations have repeatedly shown that they cannot be trusted as good-faith players in climate policymaking. On the contrary, these companies have consistently sought to delay and block action. They must finally stop spending their shareholders' money on anti-climate lobbying, front groups, and misleading public relations campaigns such as those documented in this report.

Pay an equitable share of the costs of climate damages; climate adaptation; and the environmental, social, and systemic impacts of fossil fuel products and production.

For too long, fossil fuel corporations have privatized the profits of oil, gas, and coal while socializing the massive costs they could have prevented society from incurring. All of us are living with the effects of extreme heat, stronger hurricanes, extreme flooding, more devastating wildfires, and other climate impacts—which take an enormous toll on our lives, well-being, and cultural heritage and impose an enormous economic burden. Environmental racism compounds the harm for Black, Brown, and Indigenous communities in the United States and across the Global South.

To meet this demand, major fossil fuel companies would need to pay for losses and damage from fossil fuel exploration, production, transportation, and burning. It would also entail covering the costs to decommission and clean up fossil fuel facilities while supporting workers and communities in the transition to a clean energy economy.

Fully disclose, and regularly and publicly report on, risks and impacts to the climate, communities, and the economy.

The ongoing expansion of fossil fuel exploration, production, and infrastructure is driving disruptive climate change, which in turn threatens the safety and security of communities and the stability of the global economy. The business models of major fossil fuel corporations still revolve around expanding fossil fuel production.

Major fossil fuel companies have fought hard to block mandatory and standardized corporate climate disclosures. They pressed for the SEC and the state of California to water down and delay climate disclosure requirements, and have worked through trade associations to target such rules for elimination and sue to block their implementation.

As a first step, major fossil fuel corporations must tell the US Chamber of Commerce to stand down and drop anti-disclosure lawsuits. They must then comply promptly and thoroughly with disclosure requirements in jurisdictions around the world. They must also stop attacking investors calling for robust and meaningful ESG data to be factored into investment decisions.

Accelerate actions, investment, and business planning for a fair and fast phaseout of fossil fuels worldwide.

The latest science from the IPCC and the International Energy Agency shows that projected emissions from current fossil fuel infrastructure will already exceed the levels needed to keep global temperature increase less than 1.5°C above preindustrial levels. Further expansion of fossil fuels is incompatible with climate goals (IEA 2021; IPCC 2023).

To begin to meet this demand, major fossil fuel corporations must stop exploring for new fossil fuels, stop expanding fossil fuel extraction, and stop building new fossil fuel infrastructure. These companies' leadership can decide whether they want to redirect their investments toward renewable energy or plan for a managed decline of their fossil fuel production. Today, many of them are doing exactly the opposite—shrinking their spending on renewables while doubling down on oil and gas.

Stop violating civil rights, human rights, and the rights of Indigenous peoples.

The extractive business models of major fossil fuel producers systematically threaten human rights, Indigenous rights, and territorial sovereignty. Human rights defenders and Indigenous protectors of water and land have lost their liberty and sometimes their lives resisting fossil fuel exploration, extraction, infrastructure, despoliation of nature, and expropriation of the commons.

Major fossil fuel corporations must fulfill the responsibility to respect human rights affirmed in the United Nations Guiding Principles on Business and Human Rights and comply with other international instruments, including the United Nations Declaration on the Rights of Indigenous Peoples.

They should begin by dropping any strategic lawsuits against public participation (SLAPPs) and forswearing future use of SLAPPs and other judicial harassment tactics against human rights, Indigenous rights, and climate justice activists.

Recommendations to the US Congress

President Trump has vowed to quash lawsuits against the fossil fuel industry, and at least twice in recent history, there have been documented efforts by oil and gas corporations and their allies to secure a blanket waiver of liability for the industry. Borrowing a page from the gun industry's playbook, oil and gas corporations even attempted to block access to the courts completely when they sought a liability waiver from Congress in 2018.

In the current political context, we have reason to believe that the fossil fuel industry and its allies will attempt yet again to pass some form of liability waiver and get off scot-free for decades of deception, pollution, and massive damage to people and the planet. Congress must do everything in its power to ensure such an effort does not succeed.

Communities and states seeking to hold ExxonMobil, API, and other fossil fuel industry entities accountable need support from their federal representatives. Members of Congress should champion climate accountability, highlighting evidence from their own investigations and the examples in this report to challenge oil and gas corporations' climate deception and insist that they pay their fair share of the massive and mounting costs to protect communities from the impacts of climate change.

This is a pivotal moment. It is more critical than ever to build the scientific and legal evidence base to support fossil fuel industry accountability and to collaborate across academic, business, legal, policy, and community sectors. By revoking the social license of corporations that fail to act responsibly, we can advance a vision of accountability that aligns with the urgency of the climate crisis. UCS reaffirms its commitment to holding fossil fuel corporations accountable for their role in the climate crisis and to advocating for the transformative change needed to secure a healthy, equitable, and sustainable future.

Authors

L. Delta Merner is the lead scientist for the Science Hub for Climate Litigation at UCS. **Kathy Mulvey** is the accountability campaign director for the Climate and Energy Program. **Laura Peterson** is a senior analyst for the program. **Seth Shulman** is a veteran science journalist and author, and former editorial director at UCS.

Acknowledgments

This report was made possible by the generous support of Grantham Foundation for the Protection of the Environment, Rockefeller Family Fund, Zegar Family Foundation, and UCS members.

For their thoughtful comments on the review draft of this report, we thank our UCS colleagues Kate Cell, Rachel Cleetus, Amanda Fencl, and Megan Rising, as well as external reviewers including Peter Frumhoff, Harvard University and Woodwell Climate Research Center. The authors are deeply grateful to Pallavi Shrestha at UCS, for her skillful project management and support of the research, analysis, and writing.

Special thanks go to Heather Tuttle, Bryan Wadsworth, and Cynthia Williams for their roles in the report's design, editing, and production; to Carly Phillips for data visualization; and to Eric Schulz and Daela Taeoalii-Tipton for communications support.

Organizational affiliations are listed for identification purposes only. The opinions expressed herein do not necessarily reflect those of the organizations that funded the work or the individuals who reviewed it. The Union of Concerned Scientists bears sole responsibility for the report's content.

References

Alvord, A. 2015. "WSPA Lies: Oil Companies Are At It Again . . . and California Is the Target." *The Equation* (blog). August 19. https://blog.ucs.org/adrienne-alvord/wspa-oil-companies-california-849/

Aronczyk, Melissa, Patrick McCurdy, and Chris Russill. 2024. "Greenwashing, Net-Zero, and the Oil Sands in Canada: The Case of Pathways Alliance." *Energy Research & Social Science* 112 (June): 103502. https://doi.org/10.1016/j.erss.2024.103502

Arrhenius, Svante. 1896. "On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground." *Philosophical Magazine and Journal of Science*, 5 (41): 237–76. https://www.rsc.org/images/arrhenius1896_tcm18-173546.pdf

As You Sow. 2024. "As You Sow Response to Dismissed ExxonMobil Lawsuit Against Shareholders." Press Release, June 18. https://www.asyousow.org/press-releases/2024/6/18/as-you-sow-response-dismissed-exxonmobil-lawsuit-against-shareholders

AXPC (American Exploration & Production Council). 2024. Board Meeting, August 9. https://www.documentcloud.org/documents/25196783-axpc-board-book-aug-9-2024/

Banerjee, Neela. 2015. "Exxon's Oil Industry Peers Knew About Climate Dangers in the 1970s, Too." *Inside Climate News*, December 22, 2015. https://insideclimatenews.org/news/22122015/exxon-mobil-oil-industry-peers-knew-about-climate-change-dangers-1970s-american-petroleum-institute-api-shell-chevron-texaco/

Bassetti, Francesco. 2022. "Success or Failure? The Kyoto Protocol's Troubled Legacy." *Foresight* (blog). December 8. https://www.climateforesight.eu/articles/success-or-failure-the-kyoto-protocols-troubled-legacy/

Black, J. F. 1978. Memorandum to F. G. Turpin, June 6. Florham Park, NJ: Exxon Research and Engineering Co. https://www.climatefiles.com/exxonmobil/1978-exxon-memo-on-greenhouse-effect-for-exxon-corporation-management-committee/

Bonneuil, Christophe, Pierre-Louis Choquet, and Benjamin Franta. 2021. "Early Warnings and Emerging Accountability: Total's Responses to Global Warming, 1971–2021." *Global Environmental Change* 71: 102386. https://doi.org/10.1016/j.gloenvcha.2021.102386

BP. 2011. *BP Financial and Operating Information 2006–2010*. London. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/investors/bp-foi-2006-2010-introduction-and-history.pdf

Brulle, Robert J. 2023. "Advocating Inaction: A Historical Analysis of the Global Climate Coalition." *Environmental Politics* 32 (2): 185–206. https://doi.org/10.1080/09644016.2022.2058815

Brulle, Robert, and Christian Downie. 2022. "Following the Money: Trade Associations, Political Activity and Climate Change." *Climatic Change* 175 (3–4): 11. https://doi.org/10.1007/s10584-022-03466-0

Bush, Evan, and Hal Bernton. 2020. "BP Pulls out of Regional Oil Trade Organization over Differences on Carbon Pricing, Fuel Standard." *The Seattle Times*, February 26, 2020. https://www.seattletimes.com/seattle-news/environment/bp-pulls-out-of-regional-oil-trade-

organization-over-differences-on-carbon-pricing-fuel-standard/

Cama, Timothy. 2018. "Exxon Mobil Leaves Conservative Advocacy Group ALEC." *The Hill*, July 12, 2018. https://thehill.com/policy/energy-environment/396700-exxon-leaves-conservative-advocacy-group-alec/

Carter, Lawrence. 2021. "Inside Exxon's Playbook: How America's Biggest Oil Company Continues to Oppose Action on Climate Change." *Unearthed*, June 30, 2021. https://unearthed.greenpeace.org/2021/06/30/exxon-climate-change-undercover/

Channel 4 News. 2021. "Revealed: ExxonMobil's Lobbying War on Climate Change Legislation." Facebook, June 30. https://www.facebook.com/Channel4News/videos/931130794129487/

Chen, Hao, James M. Samet, Philip A. Bromberg, and Haiyan Tong. 2021. "Cardiovascular Health Impacts of Wildfire Smoke Exposure." *Particle and Fibre Toxicology* 18 (1): 2. https://doi.org/10.1186/s12989-020-00394-8

Chevron. 2022a. "Chevron 2022 Lobbying Expenditures Through Trade Associations." https://www.chevron.com/-/media/chevron/investors/documents/2022-trade-associations.pdf

Chevron. 2022b. "Our History." https://www.chevron.com/-/media/chevron/about/documents/chevron-history.pdf

Chevron. 2023. "Lobbying and Trade Associations." https://www.chevron.com/-/media/chevron/investors/documents/2023-lobbying-and-trade-associations-sept-update.pdf

CIEL (Center for International Environmental Law). 2017. "1968: Robinson Report, Reprise." *Smoke & Fumes*. https://www.smokeandfumes.org/fumes/moments/6

Clark, Lesley. 2025. "Oil Industry Allies Launch Campaign against Climate Lawsuits." *E&E News by POLITICO*, February 28, 2025. https://www.eenews.net/articles/oil-industry-allies-launch-campaign-against-climate-lawsuits/

Climate Investigations Center. 2018. "Trade Associations and the Public Relations Industry." https://climateinvestigations.org/trade-association-pr-spending/

Climate Investigations Center. 2019. "Exxon and Friends Still Funding Climate Denial and Obstruction Through IPAA, FTI, Energy in Depth." December 20, 2019. https://climateinvestigations.org/exxon-and-friends-still-funding-climate-denial-and-obstruction-through-ipaa-fti-energy-in-depth/

CMD (Center for Media and Democracy). n.d. "Energy Discrimination Elimination Act." Accessed June 5, 2024. https://www.alecexposed.org/wiki/Energy_Discrimination_Elimination_Act

Cohen, R. 1981. Memorandum to W. Glass, August 18, 163. https://climateintegrity.org/uploads/media/DeceptionBinder_September2019.pdf

Cohen, R. 1982. "CO2 Climate Modeling Research." Memorandum to A. M. Natkin, August 25. Linden, NJ: Exxon Research and Engineering Co. https://climatefiles.com/exxonmobil/1982-exxon-memo-summarizing-climate-modeling-and-co2-greenhouse-effect-research/

Copley, Michael. 2025. "Exclusive: Climate Activists Were Hacked. There Was a Link between Victims and an Alleged Attacker." *NPR*, April 15, 2025, sec. Climate. https://www.npr.org/2025/04/15/nx-s1-5352761/hacking-climate-change-activists-exxonmobil-dcigroup

Copley, Michael, and Jeff Brady. 2023. "Private Detective Who Led a Hacking Attack against Climate Activists Gets Prison Time." *NPR*, November 16, 2023, sec. Climate. https://www.npr.org/2023/11/16/1213320496/azari-israeli-private-detective-hacking-climate-change-activists-exxonmobil

CSHC (Campaign for a Safe and Healthy California). 2024. *Big Oil's Dark Money Ad Campaign Exposed*. https://www.cavsbigoil.com/Big-Oils-Dark-Money-Ad-Campaign-Exposed_Alt.pdf

Cushman, J. 1998. "Industrial Group Plans to Battle Climate Treaty." *New York Times*, April 26, 1998. https://link.gale.com/apps/doc/A150207290/SPJ.SP24?u=mlin_m_unioncon&sid=bookmark-SPJ.SP24&xid=8de3c1fd

Dahl, Kristina A., John T. Abatzoglou, Carly A. Phillips, J. Pablo Ortiz-Partida, Rachel Licker, L. Delta Merner, and Brenda Ekwurzel. 2023. "Quantifying the Contribution of Major Carbon Producers to Increases in Vapor Pressure Deficit and Burned Area in Western US and Southwestern Canadian Forests." *Environmental Research Letters* 18 (6): 064011. https://doi.org/10.1088/1748-9326/acbce8

DeMelle, Brendan. 2011. "'Energy In Depth' Was Created by Major Oil and Gas Companies According to Industry Memo." *DeSmog*, February 17, 2011. https://www.desmog.com/2011/02/17/energy-depth-was-created-major-oil-and-gas-companies-according-industry-memo/

Deutsche Umwelthilfe. 2024. "Climate Lawsuit by Deutsche Umwelthilfe Successful: Mineral Oil Company BP Is No Longer Allowed to Advertise Engine Oil as "Climate Neutral" As Before." Press release, September 3. https://www.duh.de/presse/pressemitteilungen/pressemitteilung/klimaklage-der-deutschen-umwelthilfe-erfolgreich-mineraloelkonzern-bp-darf-motorenoel-nicht-mehr-wie/

Dunn, Katherine. 2021. "Investors Want Exxon Mobil to Change. Is It Ready?" *Fortune*, June 2, 2021. https://fortune.com/longform/exxon-mobil-shareholders-oil-companies-covid-ceo-darren-woods-profits-debt-green-energy-fossil-fuels-fortune-500/

Ekwurzel, B., J. Boneham, M. W. Dalton, R. Heede, R. J. Mera, M. R. Allen, and P. C. Frumhoff. 2017. "The Rise in Global Atmospheric CO_2, Surface Temperature, and Sea Level from Emissions Traced to Major Carbon Producers." *Climatic Change* 144 (4): 579–90. https://doi.org/10.1007/s10584-017-1978-0

Elbein, Saul. 2023. "Documents Reveal How Fossil Fuel Industry Created, Pushed Anti-ESG Campaign." *The Hill*, May 18, 2023. https://thehill.com/policy/equilibrium-sustainability/4010800-documents-fossil-fuel-anti-esg-campaign/

Ellfeldt, Avery. 2024. "SEC Climate Rule Offers Escape Hatch to Corporations, Critics Say." *E&E News by POLITICO*, March 7, 2024. https://www.eenews.net/articles/sec-climate-rule-offers-escape-hatch-to-corporations-critics-say/

Energy in Depth. 2017. "#ExxonKnew Timeline: It All Goes Back to La Jolla." Archived April 28, 2021. https://web.archive.org/web/20210428164751/https://eidclimate.org/wp-content/uploads/2017/10/ExxonKnew-Timeline-La-Jolla_03.pdf

Energy in Depth. n.d.a. "About EID." Accessed June 5, 2024. https://www.energyindepth.org/about/

Energy in Depth. n.d.b. "The Climate Benefits of Natural Gas." Accessed June 5, 2024. https://eidclimate.org/natural-gas-climate-change/

ExxonMobil. 2023a. "2023 Advocacy Report." Accessed April 7, 2025. https://corporate.exxonmobil.com/-/media/global/files/policy/2023-advocacy-report.pdf

ExxonMobil. 2023b. "Our History." https://corporate.exxonmobil.com/who-we-are/our-global-organization/our-history

Ferral, W. 1979. "Controlling the CO_2 Concentration in the Atmosphere." Memorandum to R. L. Hirsch, October 16. Florham Park, NJ: Exxon Research and Engineering Company. https://www.climatefiles.com/exxonmobil/1979-exxon-memo-on-potential-impact-of-fossil-fuel-combustion/

Foote, Eunice. 1856. "Circumstances Affecting the Heat of the Sun's Rays: Art. XXXI." *The American Journal of Science and Arts* XXII (LXVI): 382–83. https://ia800409.us.archive.org/31/items/mobot31753002152491/mobot31753002152491.pdf

Frazin, Rachel, and Taylor Giorno. 2024. "Oil Bigwigs Open Wallets for Trump After Billion-Dollar Request." *The Hill*, October 31, 2024. https://thehill.com/policy/energy-environment/4961820-oil-bigwigs-open-wallets-for-trump-after-billion-dollar-request/

Frumhoff, Peter C., Richard Heede, and Naomi Oreskes. 2015. "The Climate Responsibilities of Industrial Carbon Producers." *Climatic Change* 132 (2): 157–71. https://doi.org/10.1007/s10584-015-1472-5

FTC (Federal Trade Commission). 2002. "With Conditions, FTC Approves Merger of Phillips and Conoco." Press release, August 30.

Glaser, M. B. 1982. "CO_2 Greenhouse Effect." Memorandum to Exxon Research and Engineering Company Management, November 12. https://www.climatefiles.com/exxonmobil/1982-memo-to-exxon-management-about-co2-greenhouse-effect/

Grasso, Marco, and Richard Heede. 2023. "Time to Pay the Piper: Fossil Fuel Companies' Reparations for Climate Damages." *One Earth* 6 (5): 459–63. https://doi.org/10.1016/j.oneear.2023.04.012

HCOA and SCOB (House Committee on Oversight and Accountability [Democrats] and Senate Committee on the Budget). 2024. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change; Joint Staff Report.* Washington, DC: US Government Publishing Office. https://www.budget.senate.gov/imo/media/doc/fossil_fuel_report1.pdf

Hoffert, Martin. 2019. Testimony, *Examining the Oil Industry's Efforts to Suppress the Truth About Climate Change: Hearing before the House Committee on Oversight and Government Reform (Democrats)*. 116th Cong. https://oversightdemocrats.house.gov/sites/evo-subsites/democrats-oversight.house.gov/files/MIH%20Written%20Testimony.pdf

Heede, Richard. 2014. "Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010." *Climatic Change* 122 (1–2): 229–41. https://doi.org/10.1007/s10584-013-0986-y

Hiar, Corbin. 2021. "Exxon Splits with Lobbyist Who Divulged Climate Strategy." *E&E News by POLITICO*, September 28, 2021. https://www.eenews.net/articles/exxon-splits-with-lobbyist-who-divulged-climate-strategy/

Hong, Ki P., Melissa L. Miles, and Bakhshi-Azar. 2022. "Companies Face New Pressure from Shareholders and Regulators to Disclose Political Policies and Contributions." Skadden, Arps, Slate, Meagher & Flom LLP. https://www.skadden.com/insights/publications/2022/01/2022-insights/regulation-enforcement-and-investigations/companies-face-new-pressure-from-shareholders

IEA (International Energy Agency). 2021. Net Zero by 2050: *A Roadmap for the Global Energy Sector*. https://www.iea.org/reports/net-zero-by-2050

Ikard, F. 1965. "Meeting the Challenges of 1966." In *Proceedings of the American Petroleum Institute* (1965), 12–15. https://www.documentcloud.org/documents/5348130-1965-API-Proceedings

InfluenceMap. 2021. *Corporate Climate Policy Footprint*. London. https://influencemap.org/report/The-Carbon-Policy-Footprint-Report-2021-670f36863e7859e1ad7848ec601dda97

InfluenceMap. 2024. *The Carbon Majors Database: Launch Report*. London. https://influencemap.org/briefing/The-Carbon-Majors-Database-26913

InfluenceMap. 2025. *Carbon Majors: 2023 Data Update.* London. https://influencemap.org/briefing/The-Carbon-Majors-Database-2023-Update-31397

IPCC (Intergovernmental Panel on Climate Change). 2013. "Detection and Attribution of Climate Change: From Global to Regional." In *Climate change 2013 – The physical science basis*, first edition, edited by Thomas F. Stocker, Dahe Qin, Gian-Kasper Plattner, Melinda M. B. Tignor, Simon K. Allen, Judith Boschung, and Alexander Nauels, 867–952. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781107415324.022

IPCC (Intergovernmental Panel on Climate Change). 2023: *Climate Change 2023: Synthesis Report.* Geneva, Switzerland. https://doi.org/10.59327/IPCC/AR6-9789291691647

John, Rebecca. 2025. "Breaking: Alleged Exxon Hacker-for-Hire Loses Extradition Fight In London Court." DeSmog, April 30, 2025. https://www.desmog.com/2025/04/30/breaking-alleged-exxon-hacker-for-hire-loses-extradition-fight-in-london-court/

Johnson, Lamar. 2025. "SEC Withdraws Defense of Climate-Risk Disclosure Rule." *ESG Dive* (blog). March 28. https://www.esgdive.com/news/sec-withdraws-climate-risk-disclosure-rule-defense-eighth-circuit-reactions/743860/

Joselow, Maxine, and Anna Phillips. 2025. "The oil industry takes its critics to court." *Washington Post*, March 27, 2025. https://link.gale.com/apps/doc/A832759845/STND?u=mlin_m_unioncon&sid=bookmark-STND&xid=bbf85ccf

Licker, R., B. Ekwurzel, S. C. Doney, S. R. Cooley, I. D. Lima, R. Heede, and P. C. Frumhoff. 2019. "Attributing Ocean Acidification to Major Carbon Producers." *Environmental Research Letters* 14 (12): 124060. https://doi.org/10.1088/1748-9326/ab5abc

Marvel, Kate, Wenying Su, Roberto Delgado, Sarah Aarons, Abhishek Chatterjee, Margaret E. Garcia, Zeke Hausfather, et al. 2023. "Chapter 2: Climate Trends." In *Fifth national climate assessment*, edited by A. R. Crimmins, C. W. Avery, D. R. Easterling, K. E. Kunkel, B. C. Stewart, and T. K. Maycock. Washington, DC: US Global Change Research Program. https://doi.org/10.7930/NCA5.2023.CH2

Matthews, Christopher M. 2023. "Exxon's Climate Opponents Were Infiltrated by Massive Hacking-for-Hire Operation." *The Wall Street Journal*, March 29, 2023. https://www.wsj.com/articles/massive-hacking-for-hire-operation-infiltrated-exxons-climate-opponents-prosecutors-say-8ccfdba

Matthews, Christopher M., Jenny Strasburg, and Bradley Hope. 2024. "The Israeli Investigator Who Delivered Dirt on Exxon's Enemies." *The Wall Street Journal*, December 4, 2024. https://www.wsj.com/business/eitan-arusy-hacking-investigation-exxon-elliott-management-15b8faf3

McGowan, Kat. 2021. "Engine 1's Exxon Insurgency Suggests the Bottom Line Is the Key to a Big Oil Revolution." *Fix*, June 16, 2021. https://grist.org/fix/pollution/engine-1-exxon-insurgency-suggests-bottom-line-big-oil-climate-revolution/

Morenne, Benoît, and Collin Eaton. "Oil Firms Seize Chance to Fight State Climate Laws—With Trump's Help." *The Wall Street Journal*, March 22, 2025. https://www.wsj.com/business/energy-oil/oil-companies-seek-trumps-help-to-thwart-climate-lawsuits-superfund-laws-7e332d0d

Mulvey, Kathy, and Seth Shulman. 2015. *The Climate Deception Dossiers*. Cambridge, MA : Union of Concerned Scientists. https://www.ucs.org/sites/default/files/attach/2015/07/The-Climate-Deception-Dossiers.pdf

Mulvey, Kathy. 2018. "BP's Hypocrisy on Climate Policy." *The Equation* (blog). December 19. https://blog.ucs.org/kathy-mulvey/bps-hypocrisy-on-climate-policy/

Mulvey, Kathy. 2024. "As Its Lone Climate Scientist Board Member Departs, ExxonMobil Still Heads in the Wrong Direction." *The Equation* (blog). April 4. https://blog.ucs.org/kathy-mulvey/as-its-lone-climate-scientist-board-member-departs-exxonmobil-still-heads-in-the-wrong-direction/

Nanko, Mirjam O., and Travis G. Coan. 2024. "Defeating Cap-and-Trade: How the Fossil Fuel Industry and Climate Change Counter Movement Obstruct U.S. Climate Change Legislation." *Global Environmental Change* 89: 102919. https://doi.org/10.1016/j.gloenvcha.2024.102919

NASA GISS (National Aeronautics and Space Administration, Goddard Institute for Space Studies). n.d. "Global Mean CO2 Mixing Ratios (ppm): Observations." Accessed June 5, 2024. https://data.giss.nasa.gov/modelforce/ghgases/Fig1A.ext.txt

Negin, Elliott. 2020. "ExxonMobil Foundation & Corporate Grants to Climate Science Denier & Obstructionist Organizations." *The Equation* (blog), October 22. https://ucs-documents.s3.amazonaws.com/clean-energy/exxon-mobil-grants-1998-2019.pdf

Nelson, J. 1980. Letter to AQ-9 Task Force, March 18. Accessed June 5, 2024. https://www.industrydocuments.ucsf.edu/docs/gffl0228

NOAA GML (National Oceanic and Atmospheric Administration, Global Monitoring Laboratory). 2025. "Trends in Atmospheric Carbon Dioxide (CO_2): Last 1 Year." https://gml.noaa.gov/ccgg/trends/weekly.html

NOAA NCEI (National Oceanic and Atmospheric Administration, National Centers for Environmental Information). 2020. U.S. billion-dollar weather and climate disasters, 1980 - present (NCEI Accession 0209268); accessed February 5, 2025. https://doi.org/10.25921/STKW-7W73

NOAA NCEI (National Oceanic and Atmospheric Administration, National Centers for Environmental Information). 2024. "Monthly Global Climate Report for Annual 2024." https://www.ncei.noaa.gov/access/monitoring/monthly-report/global/202413

Noor, Dharna. 2023. "Rightwing War on 'Woke Capitalism' Partly Driven by Fossil Fuel Interests and Allies." *The Guardian*, June 22, 2023, sec. US news. https://www.theguardian.com/us-news/2023/jun/22/rightwing-war-on-woke-capitalism-industry-interests.

Office of the US President. 2025a. "Protecting American Energy From State Overreach." April 8. https://www.federalregister.gov/documents/2025/04/14/2025-06379/protecting-american-energy-from-state-overreach

Office of the US President. 2025b. "Unleashing American Energy." January 20. https://www.federalregister.gov/documents/2025/01/29/2025-01956/unleashing-american-energy/

OGCI (Oil and Gas Climate Initiative). n.d. "About OGCI." Accessed February 5, 2025. https://www.ogci.com/

OpenSecrets. n.d. "Oil & Gas Lobbying." Accessed February 5, 2025. https://www.opensecrets.org/industries/lobbying?cycle=2024&ind=E01

Peterson, Laura. 2024. "Public Pressure on ExxonMobil Works. Little Else Does." *The Equation* (blog). February 1. https://blog.ucs.org/laura-peterson/public-pressure-on-exxonmobil-works-little-else-does/

Preston, A. 2010. "2009 ExxonMobil Gift of $76,106." Memorandum to Karen McLaine, Marci Miller, Lynne Nee, Nayla Rathie, Nancy Brickhouse, Robert Palleschi, and Margaret Carroll, January 21. Cambridge, MA: Harvard & Smithsonian Center for Astrophysics. https://s3.amazonaws.com/ucs-documents/global-warming/Climate-Deception-Dossier-1_Willie-Soon.pdf

Public Health Law Center. 2019. "The Master Settlement Agreement: An Overview." January. https://www.publichealthlawcenter.org/sites/default/files/resources/MSA-Overview-2019.pdf

Raymond, Lee. 1996. "Climate Change: Don't Ignore the Facts." In *Global warming: Who's right?* Irving, TX: Exxon Corporation. https://climateintegrity.org/uploads/deception/1996-Exxon-Global-Warming-Whos-Right.pdf

Robinson, Elmer, and R C. Robbins. 1968. "Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants. Final Report and Supplement. Standford Research Institute." *Smoke & Fumes*. https://www.smokeandfumes.org/documents/document16

Royal Dutch Shell Group. 1998. *Group Scenarios 1998–2020*, 115, 118. http://www.documentcloud.org/documents/4430277-27-1-Compiled.html

Santer, B. D., K. E. Taylor, T. M. L. Wigley, T. C. Johns, P. D. Jones, D. J. Karoly, J. F. B. Mitchell, et al. 1996. "A Search for Human Influences on the Thermal Structure of the Atmosphere." *Nature* 382 (6586): 39–46. https://doi.org/10.1038/382039a0

Santer, Benjamin D., Stephen Po-Chedley, Lilong Zhao, Cheng-Zhi Zou, Qiang Fu, Susan Solomon, David W. J. Thompson, et al. 2023. "Exceptional Stratospheric Contribution to Human Fingerprints on Atmospheric Temperature." *Proceedings of the National Academy of Sciences* 120 (20): e2300758120. https://doi.org/10.1073/pnas.2300758120

Satter, Raphael, and Christopher Bing. 2024. "Exclusive: Exxon Lobbyist Investigated over Hack-and-Leak of Environmentalist Emails, Sources Say." *Reuters*, November 27, 2024. https://www.reuters.com/business/energy/exxon-lobbyist-investigated-over-hack-and-leak-environmentalist-emails-sources-2024-11-27/

Scott-Railton, John, Adam Hulcoop, Bahr Abdul Razzak, Bill Marczak, Siena Anstis, and Ron Deibert. 2020. *Dark Basin: Uncovering a Massive Hack-For-Hire Operation*. Citizen Lab Research Report No. 128, Toronto: University of Toronto. http://hdl.handle.net/1807/106038

SEC (Securities and Exchange Commission). n.d. "ExxonMobil Capital and Exploration Expenditure (Upstream + Downstream) 2009-2022." https://ucs-documents.s3.us-east-1.amazonaws.com/global-warming/XOM-capex-2009-2022-v2.pdf

Seneviratne, S. I., X. Zhang, M. Adnan, W. Badi, C. Dereczynski, A. Di Luca, S. Ghosh, et al. 2021. "Weather and Climate Extreme Events in a Changing Climate." In *Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, edited by V. Masson-Delmotte, P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, et al., 1513–1766. Cambridge: Cambridge University Press.

Shabecoff, Philip. 1988. "Global Warming Has Begun, Expert Tells Senate." *New York Times*, June 24, 1988. https://link.gale.com/apps/doc/A175878394/SPJ.SP24?u=mlin_m_unioncon&sid=bookmark-SPJ.SP24&xid=812a642c

Shaw, H. 1977. "Environmental Effects of Carbon Dioxide." Memorandum to John W. Harrison, October 31. https://insideclimatenews.org/wp-content/uploads/2015/09/Government-Meeting-Memo-1977.pdf

Shaw, H. 1980. "CO_2 Greenhouse Effect." Memorandum to T. K. Kett, December 18. https://www.climatefiles.com/exxonmobil/1980-exxon-memo-on-the-co2-greenhouse-effect-and-current-programs-studying-the-issue/

Shaw, H. 1984. "CO_2 Greenhouse and Climate Issues." Presentation at EUSA/ER&E Environmental Conference, Florham, NJ, March 28. https://www.climatefiles.com/exxonmobil/1984-exxon-presentation-on-co2-greenhouse-and-climate-issues/

Shell Internationale Petroleum. 1988. *The Greenhouse Effect*. Report series HSE 88-001, 1–27. The Netherlands. https://embed.documentcloud.org/documents/4411090-Document3/?embed=1#document/p9/a411239

Smith, Timothy. 2024. "ExxonMobil's Lawsuit Against Its Shareholders: A Cautionary Tale." *The Harvard Law School Forum on Corporate Governance* (blog). June 12, 2024. https://corpgov.law.harvard.edu/2024/06/12/exxonmobils-lawsuit-against-its-shareholders-a-cautionary-tale/

SourceWatch. n.d. "ALEC Corporations." Accessed June 5, 2024. https://www.sourcewatch.org/index.php/ALEC_Corporations

Streett, Mary. 2019. "Information Note: Reputational Risk Associated with Upcoming BP Advocacy Campaign to Protect Cherry Point Refinery's Licence to Operate." October 10. https://journalistsstudio.google.com/pinpoint/document-view?collection=50a90caf6871715e&amp%3Butm_source=collection_share_email&amp%3Bpli=1&p=13&docid=bb5c80380c8b47c3_50a90caf6871715e&page=4

Supran, Geoffrey, and Naomi Oreskes. 2017. "Assessing ExxonMobil's Climate Change Communications (1977–2014)." *Environmental Research Letters* 12 (8): 084019. https://doi.org/10.1088/1748-9326/aa815f.

Supran, G., S. Rahmstorf, and N. Oreskes. 2023. "Assessing ExxonMobil's Global Warming Projections." *Science* 379 (6628): eabk0063. https://doi.org/10.1126/science.abk0063

Tabuchi, Hiroko. 2020. "Global Firm Casts Big Oil's Messages as Grass-Roots Campaigns." *New York Times*, November 12, 2020. https://link.gale.com/apps/doc/A641262314/SPJ.SP24?u=mlin_m_unioncon&sid=bookmark-SPJ.SP24&xid=ecb32e4b

Teller, Edward. 1960. "Energy Patterns of the Future." In Energy and man: A symposium, edited by A. Nevins and C. C. Brown, 58. New York: Appleton-Century-Crofts.

The White House. 1965. *Restoring the Quality of Our Environment: Report of the Environmental Pollution Panel, President's Science Advisory Committee*. Washington, DC. https://nsarchive.gwu.edu/document/31937-document-2-white-house-report-restoring-quality-our-environment-report-environmental

Tucker, Christopher D., and Ana C. Heeren. 2014. "Managing Aboveground Risks: Experience from the United States." Presentation at the Brazilian Petroleum, Gas and Biofuels Institute Rio Oil & Gas Expo and Conference, Rio de Janeiro, Brazil, September. FTI Consulting. https://www.documentcloud.org/documents/6571135-FTI-Consulting-and-Energy-in-Depth/

UCS (Union of Concerned Scientists). 2015. "Climate Deception Dossier #3." https://www.ucs.org/sites/default/files/images/2015/07/gw-minigraphic-climate-deception-dossier-3-WSPA-ppt.jpg

UCS (Union of Concerned Scientists). 2022. *Is Disinformation the Same as Misinformation?* Cambridge, MA. https://www.ucs.org/resources/disinformation-same-misinformation

United States District Court, Southern District of New York. 2023. *USA v Aviram Azari: Government's Sentencing Memorandum.* October 12, 2023. https://storage.courtlistener.com/recap/gov.uscourts.nysd.521827/gov.uscourts.nysd.521827.70.0.pdf

United States District Court, Southern District of New York. 2025a. *USA v Amit Forlit: Defense Skeleton Argument*. January 20, 2025. https://legacy.www.documentcloud.org/documents/25501846-usa-v-amit-forlit-defence-skeleton-argument/

United States District Court, Southern District of New York. 2025b. *USA v Amit Forlit: Opening Note on Behalf of the Requesting State*. January 13, 2025. https://legacy.www.documentcloud.org/documents/25501a845-250113-usa-v-forlit/

US Congress. 2024a. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change, Hearings Before the Senate Committee on the Budget,* 118th Cong. S.Hrg. 118–294 (submitted evidence, "Algae Biofuels Program Talking Points," May 24, 2010). EM-HCOR3-00604560. https://journaliststudio.google.com/pinpoint/document-view?collection=50a90caf6871715e&p=45&docid=9bdb00529ee38a6d_50a90caf6871715e&page=4&dapvm=2

US Congress. 2024b. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change, Hearings Before the Senate Committee on the Budget,* 118th Cong. S.Hrg. 118-294 (submitted evidence, "Creating a Better Environment to Help BP Deliver Its Operational and Strategic Priorities in Washington State"). BPA_HCOR_00278794. https://oversightdemocrats.house.gov/sites/evo-subsites/democrats-oversight.house.gov/files/a/bp-documents/BPA_HCOR_00278794.pdf

US Congress. 2024c. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change, Hearings Before the Senate Committee on the Budget*, 118th Cong. S.Hrg. 118-294 (submitted evidence, "Email from Matthew Gobush to Gantt Walton," March 2, 2017). EM-HCOR3-00075997. https://oversightdemocrats.house.gov/sites/evo-subsites/democrats-oversight.house.gov/files/a/exxon-documents/EM-HCOR3-00075997.pdf

US Congress. 2024d. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change, Hearings Before the Senate Committee on the Budget*, 118th Cong. S.Hrg. 118-294 (submitted evidence, "Memorandum from P. W. Trelenberg to D. W. Woods," August 19, 2019). EM-HCOR3-00064980. https://journaliststudio.google.com/pinpoint/document-view?collection=50a90caf6871715e&p=44&docid=931b2caf59bd336e_50a90caf6871715e&page=4&dapvm=2

US Congress. 2024e. *Denial, Disinformation, and Doublespeak: Big Oil's Evolving Efforts to Avoid Accountability for Climate Change, Hearings Before the Senate Committee on the Budget*, 118th Cong. S.Hrg. 118-294 (submitted evidence, "OGCI Announcement Package for September 2019 – Scaling Up Action"). EM-HCOR3-00064996. https://journaliststudio.google.com/pinpoint/document-view?collection=50a90caf6871715e&p=44&docid=f67588c155bdb14b_50a90caf6871715e&page=44&dapvm=2

US Congress HCNR (House Committee on Natural Resources). 2022. *The Role of Public Relations Firms in Preventing Action on Climate Change*. Staff hearing report. Washington, DC. https://www.congress.gov/117/meeting/house/115094/documents/HHRG-117-II15-20220914-SD007.pdf

Walker, Joe. 1998. "Draft Global Climate Science Communications Plan." Memorandum to Global Climate Science Team, American Petroleum Institute. April 3. https://www.ucs.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-2_API-Climate-Science-Communications-Plan.pdf

Weinberg, H. 1980. "Greenhouse Program." Memorandum to H. Shaw and N. R. Werthamer, June 9. https://www.climatefiles.com/exxonmobil/co2-research-program/1980-internal-exxon-memorandum-greenhouse-program-2/

Westervelt, Amy. 2023. "Big Oil Firms Touted Algae as Climate Solution. Now All Have Pulled Funding." *The Guardian*, March 17, 2023. https://www.theguardian.com/environment/2023/mar/17/big-oil-algae-biofuel-funding-cut-exxonmobil

WHO (World Health Organization). 2023. "Climate Change." https://www.who.int/health-topics/climate-change#tab=tab_1

WHO FCTC (World Health Organization, Framework Convention on Tobacco Control). 2013. "Guidelines for Implementation of Article 5.3." https://fctc.who.int/resources/publications/m/item/guidelines-for-implementation-of-article-5.3

Whyte, Kyle, Rachael Novak, Matthew B. Laramie, Nicholas G. Bruscato, Dominique M. David-Chavez, Michael J. Dockry, Michael Kotutwa Johnson, et al. 2023. "Chapter 16: Tribes and Indigenous Peoples." In *Fifth national climate assessment*, edited by A. R. Crimmins, C. W. Avery, D. R. Easterling, K. E. Kunkel, B. C. Stewart, and T. K. Maycock. Washington, DC: US Global Change Research Program. https://doi.org/10.7930/NCA5.2023.CH16

Williams, Stephen B., Yong Shan, Usama Jazzar, Preston S. Kerr, Ikenna Okereke, V. Suzanne Klimberg, Douglas S. Tyler, et al. 2020. "Proximity to Oil Refineries and Risk of Cancer: A Population-Based Analysis." *JNCI Cancer Spectrum* 4 (6): pkaa088. https://doi.org/10.1093/jncics/pkaa088

WSPA (Western States Petroleum Association). 2014. *WSPA Priority Issues*. Sacramento, CA. https://www.ucs.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-3_WSPA-ppt.pdf

Williams, Stephen B., Yong Shan, Usama Jazzar, Preston S. Kerr, Ikenna Okereke, V. Suzanne Klimberg, Douglas S. Tyler, et al. 2020. "Proximity to Oil Refineries and Risk of Cancer: A Population-Based Analysis." *JNCI Cancer Spectrum* 4 (6): pkaa088. https://doi.org/10.1093/jncics/pkaa088

WSPA (Western States Petroleum Association). 2014. *WSPA Priority Issues*. Sacramento, CA. https://www.ucs.org/sites/default/files/attach/2015/07/Climate-Deception-Dossier-3_WSPA-ppt.pdf

https://doi.org/10.47923/2025.15837