

Smoke & Fumes

The Legal and Evidentiary Basis for Holding Big Oil Accountable for the Climate Crisis

Synopsis

Key Findings:



Major oil and gas companies were on notice of potential climate change risks of their products by no later than the 1950s, and were repeatedly warned of those risks from the 1960s onward.



These companies had the opportunity and capacity to reduce those risks, either by developing technologies under their control or by warning consumers and investors about climate change.



There is extensive evidence that major oil and gas producers instead worked — individually and in concert — to undermine public confidence in climate science and in the need for climate action.



By producing oil and gas in ever greater quantities despite clear evidence of its risks, oil and gas companies contributed significantly to global emissions of greenhouse gases and to increasingly disastrous climate impacts.

Climate change poses a fundamental threat to society, the environment, and human lives. The buildup of heat-trapping greenhouse gases — primarily as a result of fossil fuel use — causes global temperatures to increase over time. This temperature rise results in rising seas, more common and more severe extreme weather events, and other impacts that have a devastating impact on human life and the environment. As producers of the very products that are causing the climate crisis, fossil fuel companies may bear legal responsibility for their contributions to climate change. Whether or not these companies can be held liable depends on what they knew, when they knew it, and what they did with that information.

Climate Litigation: Causation, Attribution, and the Scientific Case against Major Carbon Producers

Across countries, legal systems, and many fields of law, the essential links in the litigation chain remain constant — an identifiable plaintiff, identifiable defendants, and a causal chain that connects the harms suf-

ferred by one to the actions or inaction of the other.

Recent years have seen dramatic advances in the science of climate attribution at every link in this chain.

As climate impacts accelerate worldwide, a growing body of evidence is enabling scientists, governments, and litigators to identify and quantify the impacts of climate change on countries, cities, communities, and even individuals. From farmers in the Peruvian Andes, to communities in the Philippines and Massachusetts, to flood control engineers in California, ever growing numbers of **plaintiffs** are able to trace the harms they are suffering or the risks they face to the rising impacts of climate change.

At the same time, by analyzing historical production of oil, gas, coal, and cement — the largest sources of industrial greenhouse gas emissions — researchers have identified ninety

fossil fuel-producing entities — fifty of which are investor-owned companies — that are responsible for nearly two-thirds of historical carbon

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and methane emissions responsible for climate change. In so doing, they have highlighted a discrete group of potential **defendants** whose contributions to the climate crisis are identifiable, measurable, and very significant.

Finally, and simultaneously, new techniques are enabling more precise calculations of the relationship between CO₂ emissions, global temperature and sea level increases, and climate impacts such as extreme

weather events. A landmark paper released in September 2017 combined these fields of attribution science for the first time, demonstrating that scientists (and plaintiffs) can now trace the contributions of individual companies to climate impacts and climate-related disasters.

But establishing that major carbon producers are causally contributing to climate impacts and climate harms is only the first step in accountability. The question remains: can we hold them responsible?

The Fundamental Elements of Responsibility: Notice of Risk and the Opportunity to Avoid or Reduce Risk

When determining whether someone can be held liable for a harm, tort law and human rights law both converge on two core elements of responsibility: An actor is responsible for a harm when they have 1) the ability to foresee a harm and 2) the



Aaron Sprecher/Greenpeace

ability and opportunity to avoid or minimize that harm.

As summarized above, emerging science has attributed specific climate change impacts to fossil fuel companies. Therefore, under multiple theories of law, these companies could be held liable if they knew or should have known of climate risks linked to their products, but failed to take action to avoid or reduce those risks — either by eliminating them or by properly warning consumers, regulators, and the public about them.

Company documents, scientific studies, and other evidence show that fossil fuel companies, especially petroleum companies, knew about the dangers of climate change — and their products' role in exacerbating it — much earlier than previously understood. This documentary evidence also reveals that major carbon producers repeatedly misled the public about climate science in an effort to stymie regulation and the development of alternative technologies.

Oil on Notice: Evidence of Early Industry Awareness of Climate Risks

The basic “greenhouse effect” through which CO₂ and other gases warm the planet has been understood for over a century. It was also understood, and widely accepted, that fossil fuel combustion released such gases into the atmosphere at higher than natural rates. Although many believed the atmosphere and oceans were too vast to be affected by human activity, a 1938 study challenged that assumption, providing early evidence that atmospheric carbon dioxide was rising. From the late 1930s onward, the link between

fossil fuel combustion and atmospheric carbon dioxide was actively discussed in the scientific literature and would have been well known to petroleum industry scientists.

The entire petroleum industry was unequivocally warned of climate change no later than 1968.

By 1957, at least one major oil company was on notice of evolving climate science. That year, a study indicated that the oceans would not absorb as much carbon dioxide as others had assumed, which would lead to the accumulation of heat-trapping gases in the atmosphere. Demonstrating that Humble Oil (now ExxonMobil) was aware of and had a stake in these findings, company scientists released a study directly challenging the findings just months later.

By 1958, the industry as a whole was studying carbon dioxide in the atmosphere through its industry organization American Petroleum Institute (API). A summary document written by the head of API's Smoke

and Fumes Committee explicitly acknowledged that at least one project was in progress at that time to study atmospheric carbon from fossil fuels.

Although not intended to study climate change specifically, numerous other scientific projects from the 1940s onward produced insights that could have or should have informed the oil industry's understanding of climate science. The industry studied paleoclimates, including historical sea levels and temperatures, to find new oil deposits. They also studied hurricane formation to better protect offshore oil rigs.

The entire petroleum industry was unequivocally warned of climate change no later than 1968. A report delivered to API that year warned explicitly of the risks of warming induced by the accumulation of greenhouse gases and noted that fossil fuel combustion was the primary driver of that accumulation. A supplement, with a more expansive discussion of the carbon dioxide issue, was delivered to API in 1969. These reports were distributed widely within the industry, as they were referenced

Excerpt from 1968 report to API*

concentrations. Measured increases in CO₂ in the atmosphere are about 0.06 ppm per month. If CO₂ levels continue to rise at present rates, it is likely that noticeable increases in temperature could occur. Changes in temperature on a world-wide scale could cause major changes in the earth's environment over the next several hundred years including change in the polar ice caps.

It seems ironic that given this picture of the likely result of massive CO₂ emissions so little concern is given to CO₂ as an important air pollutant.

*ELMER ROBINSON & R. C. ROBBINS, SOURCES, ABUNDANCE, AND FATE OF GASEOUS ATMOSPHERIC POLLUTANTS (1968), available at <https://www.osti.gov/scitech/biblio/6852325>.



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in two 1972 documents — an internal memo summarizing research procured by API and a submission to the federal government prepared by the petroleum industry. Significantly, however, the industry’s submission to the federal government discussed many sections of the 1968 report but omitted any reference to its discussion of carbon dioxide and climate change.

Internal company documents demonstrate that, between 1977 and 1982, scientists at Exxon repeatedly confirmed the scientific consensus surrounding climate change and even went so far as to explain why a study that contradicted the consensus was flawed.

Missed Opportunity: Evidence the Industry Protected its Own Assets while Downplaying Climate Threats

No later than the 1980s, and as early as the 1970s, climate change projections were being used in operational planning by at least Exxon and Shell Oil. In 1986, a research team from Imperial Oil— an Exxon subsidiary—led an expedition to understand

how climate change would affect Exxon’s arctic operations. The team leader of that expedition later noted that long-term projects would need to consider the impacts of climate change, as warming would affect ice, sea levels, and permafrost. In 1989, Shell redesigned a \$3 billion natural gas platform, increasing its elevation by one or two meters to account for rising sea levels. Anecdotal evidence, including interviews with industry insiders conducted by a co-author of this report, indicates oil compa-

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nies may have been considering and accounting for climate impacts on platforms and pipelines since the early 1970s.

Even as they protected their own assets from climate change, the petroleum industry engaged in a mas-

sive public campaign against climate science throughout the 1990s. Major oil companies created the Global Climate Coalition (GCC), which routinely asserted that climate science was not well understood, despite internal documents contradicting that position. In 1998, API prepared a “Global Climate Science Communications Plan,” which had among its stated goals ensuring that the public accept that climate science is uncertain.

This disinformation campaign continued throughout the 2000s. A recent analysis by Naomi Oreskes and Geoffrey Supran of Exxon’s communications between 1977 and 2014 found a stark difference between the certainty of climate science as described in internal memos and peer-reviewed science and the focus on uncertainty and limited climate knowledge the company emphasized in op-eds and other external communications targeted at consumers, investors, and the general public. From 2001 to 2012, ExxonMobil, API, the Charles Koch Foundation, and others funded a scientist at the Smithsonian Institution who published articles contradicting the sci-



entific consensus on climate change, though those funding ties were not disclosed. In 2014, the Western States Petroleum Association organized 16 “AstroTurf” organizations to fight greenhouse gas regulations in California. Most recently, information uncovered by the New York State Attorney General’s investigation into ExxonMobil shows that former ExxonMobil CEO Rex Tillerson used a secret email account to discuss sensitive matters, including climate change. When the company received subpoenas for the investigation, it refused to deliver the secret emails despite knowing of their existence, and allowed a file deletion program to purge months of emails on the secret account.

Not only did these companies fight against public understanding and regulation of the problem, they researched technologies that could have been — but apparently weren’t — used to mitigate or avoid the problem. Patents from the 1950s,

‘60s, and ‘70s show that several oil companies researched fuel cells, solar energy, low-emissions vehicles, and emissions reduction equipment for CO₂, among other technologies.

Beyond Exxon and Beyond the US: The Expanding Investigations into Climate Denial

Although the evidence presented here focuses primarily on US-based oil and gas companies, the relevant inquiry doesn’t end with those companies. The coal industry has a well-documented history of climate denial, begging the question of what that industry knew and when.

Nor does the evidence stop at US borders. The oil and gas companies involved in denial efforts operated worldwide, and knowledge was shared widely across the industry and within individual companies. It is highly likely that major carbon producers in Europe and elsewhere

had notice equivalent to that of their US counterparts.

To date, the role of European oil and gas companies in climate denial has received less scrutiny than that of their US counterparts. Nonetheless, a modest but compelling body of evidence demonstrates industry-funded denial was an international phenomenon. Some of the largest European oil and gas companies are known to have participated

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in US research and denial schemes, either directly or through American subsidiaries. Similar operations have been documented within Europe itself — funded both by European companies and their US counterparts.

Much remains to be discovered about these operations — the companies involved and their intersection with broader industry efforts around the world. One thing, however, is already clear. For major carbon producers around the world and the communities harmed by their decades of action and inaction on climate change: the investigations into what Exxon knew are the beginning of this story, but they are by no means the end.



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Key Conclusions

Theories regarding the potential link between fossil fuel combustion and atmospheric temperature increase were widely reported in scientific literature and academic texts relevant to the oil industry from the early decades of the 20th Century.

The oil industry had incentives, opportunity, and relevant expertise to investigate and understand climate science.

Documentary evidence demonstrates the oil industry was on notice of potential climate risks by 1957-1958.

Humble Oil, at the time a wholly-owned subsidiary of Esso (now ExxonMobil), published research acknowledging the link between fossil fuels and atmospheric CO₂ in 1957.

Industry records document that industry research into air pollution issues was highly coordinated and shared widely within the industry.

Industry records document that this coordinated industry research program included research into fossil carbon in the atmosphere by no later than 1958.

Industry records and other sources indicate that this coordinated industry research program was used to mobilize public opposition to the regulation of air pollutants by sowing doubt regarding air pollution science.

The oil industry was expressly warned of the potential severity of climate risks by its own consulting scientists in 1968 and repeatedly thereafter.

Numerous industry documents demonstrate these risks were communicated by industry scientists to executives at the highest levels of the industry many over the ensuing decades.

The oil industry held early patents on numerous technologies that might have reduced climate risks.

Even while blocking public action to address climate change, oil companies took steps to protect their own assets from climate risks. This divergence between industry communications to the public and industry action to safeguard its own investments began as early as the 1970s and is well established by the 1980s.

Notwithstanding their own best information, leading oil companies and industry associations actively participated in or funded climate misinformation efforts for decades through media intended to reach wide audiences of consumers, investors, and the general public.



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To read the full “Smoke and Fumes: The Legal and Evidentiary Basis for Holding Big Oil Accountable for the Climate Crisis” report, with citations and references, visit: www.ciel.org/smokeandfumes

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