

**Climate Change Misinformation
And Corporate Interference
In the 20th Century to Present**

by

James McGuire

A thesis submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Honors Degree in History with Distinction

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ABSTRACT

Climate change has become a major concern among many Americans who fear for the well-being of the planet if the issue is not properly addressed. Despite this, little has been done to limit the carbon emissions that cause climate change, and the discussion around climate change has become partisan. To understand why this has occurred, this paper studies the actions of leading multinational carbon emitting companies Exxon, Shell, Koch Industries, and others from the middle of the 20th century to the present through the leading climate related research. This study reveals that these companies have pursued a comprehensive agenda for climate change misinformation. This campaign began with research of the issue prior to other climate scientists and awareness of the threat of climate change. Next these companies funded think tanks, news sources, and politicians to stifle the rising concerns of climate scientists and confuse the public. This study highlights how the narrative of climate change misinformation is very malleable and resistant to factual correction. This paper ends with a discussion of how to address climate change through greater education, the potential for lawsuits against these companies, and anticipation of future problems in seeking climate change regulations.

Introduction

Climate change is the increased warming of the earth's temperature as a result of human activities and gas emissions. Fossil fuel emissions release carbon dioxide in the atmosphere which retains more of the sun's heat and thus increases the global temperature. As the process continues and as the earth becomes warmer, positive feedback loops are activated which will cause global disarray and greater warming. The effects of climate change described here are already in full effect, as it has been recorded that current warming is “roughly 10 times faster than the average rate of warming after an ice age” and Carbon dioxide from human activities is increasing about 250 times faster than it did from natural sources after the last Ice Age”.¹ This rate of warming is well above the natural variability of the Earth's warming and will be cataclysmic to the environment if not halted.

Despite this urgency, the US government has done little to address this issue, especially with regards to regulating US gas and oil companies like Exxon and Shell who contribute greatly to carbon dioxide emissions. Additionally, the issue of climate

¹ “Climate Change Evidence: How Do We Know?” Global Climate Change. NASA, March 2, 2023. <https://climate.nasa.gov/evidence/>.

change in the public sphere is very divisive. Although climate scientists reached a consensus on the issue and agreed upon the Global Intergovernmental Panel on Climate Change’s outline of climate change in 1995, the American public still perceives climate change as a contested topic.² In 2015, when asked to estimate the level of consensus among climate scientists on whether climate change was real, “only 12% of the US public accurately estimated the consensus at 91%–100%”.³ The reason for this is that the leading emitting corporations have employed and funded US politicians, think tanks, news sources, and climate contrarians with the goal of obfuscating the issue of climate change and preventing government regulation. This paper will discuss how, from the 1970s to the present, the leading CO₂-emitting corporations were able to manipulate the public debate about climate change to confuse the public and prevent government regulation.

Methodology

To map out the role of leading emitters in promoting climate change misinformation, this paper enlists multiple sources including internal company documents, consensus reports, scholarly research, national polls, and government

² John Cook *et al*, “Consensus on consensus: a synthesis of consensus estimates on human-caused global warming.” *Environmental Research Letters* 11, no. 4 (2016): 048002. [10.1088/1748-9326/11/4/048002](https://doi.org/10.1088/1748-9326/11/4/048002)

³ Naomi Oreskes, (2018). The Scientific Consensus on Climate Change: How Do We Know We’re Not Wrong?. In: A. Lloyd, E., Winsberg, E. (eds) *Climate Modelling*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-65058-6_2

documents. Also, while many companies have promoted climate change misinformation, this paper focuses on a few companies who have both greatly contributed to CO2 emissions and promoted misinformation—such as the oil extraction companies ExxonMobil, Koch Industries, and Shell. The primary target of these companies is the American public as these companies both aim to enlist them as consumers and prevent them from motivating the government to address the issue of climate change through government regulation. Finally, this paper employs the radical flank theory and the echo chamber theory to explain the potential goals of climate change misinformation.

Research and Interference

Corporations often have a financial incentive to lie to the government and the people about their products. Cigarette companies lied for decades about the health risks of their product⁴ and the gas stove industry researched and discovered the potential harm of indoor gas emissions in 1972 yet continued to deny these harms.⁵ The reason that these companies are so aware of the potential issues with their products is not so they address them, but so they can prepare tactics to confound their consumers and delay government regulation. In the case of climate change, many leading carbon emitters studied the potential impacts of their business. While they did not predate the earliest scientists in studying climate change—the earliest being Swedish physical chemist Svante Arrhenius who “estimated that doubling the level of carbon dioxide in the atmosphere would raise the mean global temperature by several degrees” in 1896—they did research before scientists had come to any sort of consensus about climate change⁶.

⁴ Geoff Dembicki. *The Petroleum Papers: Inside the Far-Right Conspiracy to Cover up Climate Change*. Vancouver: Greystone Books, 2022. Page 97.

⁵ Rebecca John. “Industry Knew about Gas Stoves' Air Pollution Problems in Early 1970s.” *DeSmog*, March 7, 2023. <https://www.desmog.com/2023/03/02/american-gas-association-knew-stoves-air-pollution-1970s/>.

⁶ Spencer Weart (2011) *Global warming: How skepticism became denial*, *Bulletin of the Atomic Scientists*, 67:1, 41-50, DOI: 10.1177/0096340210392966

Fossil fuel reliant corporations gained a head start in researching climate change because they were concerned about how their business might face future regulations. When the Imperial Oil subsidiary Suncor was fined for polluting the Athabasca River in the 1980s, (Dembicki 52) company leadership worried not about the immediate fines they were given, but how greater awareness and regulation might interfere with profits. This was outlined in various of the company's internal documents, which stated that "concern for the rights of 'native groups,'... could be translated into policies that push 'land-use planning instead of pure market-determined patterns of development,' along with a 'strong emphasis on reduced/managed energy demand and environmental protection'".⁷ This sort of development could even drive oil companies out of the market completely, as worries began that the public would prefer "the electric car, nuclear energy and other technology favoring competitive fuels".⁸ Oil companies feared the potential of alternative energy sources that come without the baggage of widespread environmental harm and have accordingly acted to minimize and downplay their role in producing this harm. In this regard, they were also far ahead of climate scientists. Many meteorologists at this time believed that the weather systems of Earth are self-correcting and that human technology did not have

⁷ Dembicki, *The Petroleum Papers*, 53.

⁸ Ibid 54.

the ability to interfere.⁹ This gave corporations the head start they needed to take control of the discussion of climate change.

Exxon funded research into the effect of fossil fuels on the climate in 1955—after being tipped off about the issue from a California Institute of Technology study in 1954 that found that “fossil-fuel combustion had caused a 5 percent increase in atmospheric CO₂ from 1854 to 1954”.¹⁰ Similar to Suncor, they predicted the potential harm public discussion of the issue may have on profits, stating that “Atmospheric Science will be of critical importance to Exxon in the next decade,” in a 1979 memo anticipating future legislative battles.¹¹ Their goal was to “determine how Exxon can best participate in all these [scientific] areas and influence possible legislation on environmental controls” as stated in a company memo.¹² Their research was well carried out and a step ahead of conclusions or studies by government and independent researchers. They developed computer models that would calculate and predict the impact carbon emissions have on global temperature¹³. They predicted that

⁹ Weart, *Global warming: How skepticism became denial*.

¹⁰ Arkush, David and Braman, Donald, *Climate Homicide: Prosecuting Big Oil For Climate Deaths* (January 23, 2023). *Harvard Environmental Law Review*, Vol. 48, No. 1, 2024: Page 18, Available at SSRN: <https://ssrn.com/abstract=4335779>.

¹¹ Dembicki, *The Petroleum Papers*, 54.

¹² *Ibid*, 54.

¹³ *Ibid*, 54.

emissions “would lead to 0.20 degrees Celsius of global warming per decade, with a margin of error of 0.04 degrees,” which turned out to be incredibly accurate.¹⁴ Their models are featured in the figure below.

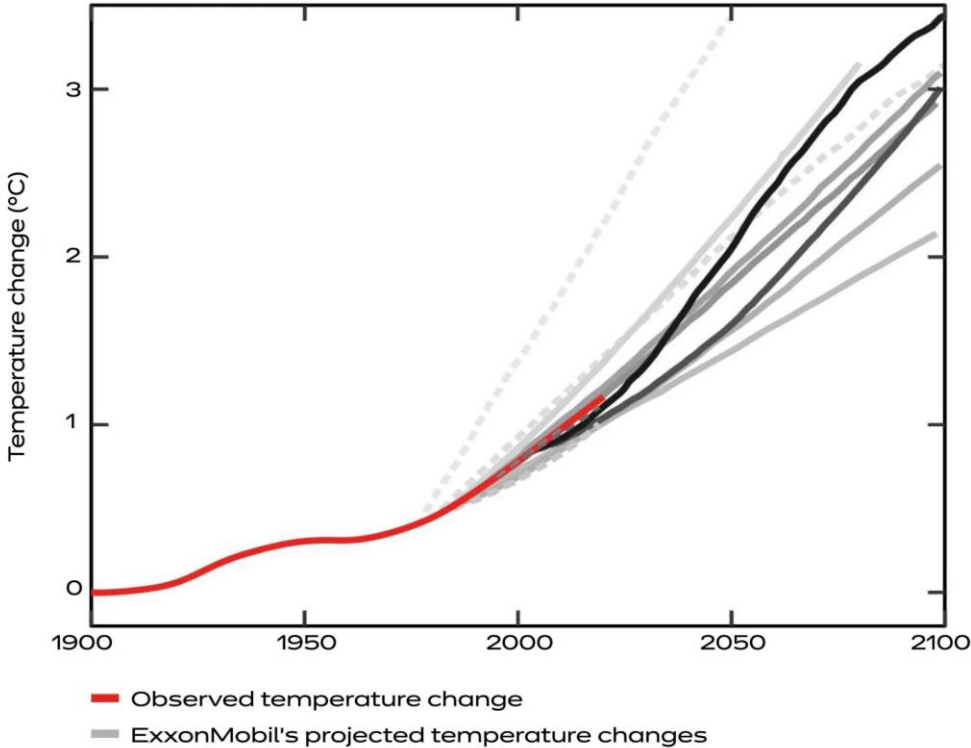


Figure 1 Exxon computer estimates of relationship between carbon emissions and temperature change. Alice McCarthy, “Exxon scientists predicted global warming with 'shocking skill and accuracy,' Harvard researchers say.” Harvard Gazette, 12 January 2023, Accessed 31 January 2023.

¹⁴ Kate Yoder and Brett Marsh. “Exxon's models predicting climate change were spot on—40 years ago.” Grist, 12 January 2023.

Their data clearly show how Exxon was aware of the potential of climate change and how they knew what would happen if they continued to produce oil. The significance of Exxon's early models is that each test demonstrated that increased carbon emissions will inevitably lead to climate change as each model predicted that the temperature would increase. Exxon Research Manager Roger Cohen went on to warn Exxon executives, stating that Exxon's products "will later produce effects which will indeed be catastrophic".¹⁵ Exxon, however, was not interested in preventing catastrophe. This extensive research was not used to avert climate change but became the foundation of Exxon and many other Oil interests campaign to deny and delay climate change.

Oil company Shell also carried out their own research. In 1981, they commissioned the University of East Anglia in England to conduct research on the greenhouse effect—the process by which greater levels of carbon in the atmosphere retains more of the sun's heat.¹⁶ In addition, they created a public affairs unit armed with this research and tasked to handle any potential issues that would arise from climate change. They "operated on the principle that once an issue reached the attention of Congress, it was already too late".¹⁷ Shell President James B. Henderson explained the rationale behind this policy, saying that "because we fail to become

¹⁵ Dembicki, *The Petroleum Papers*, 56.

¹⁶ *Ibid*, 59.

¹⁷ *Ibid*, 58.

involved in these early stages, we are forced to react—in Washington—as policy suddenly appears that is not in the nation’s best interest as we see it”.¹⁸ Similar to Exxon, Shell researchers found that increased emissions would have an effect on global temperature, and thus began to strategize how to keep this issue out of Congress.

This head start was significant as the topic of climate change would only be discussed by scientists outside of Enron in the 1990s. And public consensus was only reached when the Intergovernmental Panel on Climate Change concluded that human emissions were having an impact on the atmosphere in 1995.¹⁹ This gave the leading emitting companies ample time to develop tactics to minimize and delay the impact of climate change on regulations.

A wide range of interrelated actors

The leading actors involved in disseminating climate misinformation and denial are a few key companies that deal in fossil fuelsv emissions. During their initial campaign to halt climate legislation, they were more forward about their goals and formed the global climate coalition. This group was founded in 1989 in response to the

¹⁸ Ibid, 58.

¹⁹ Oreskes, “Scientific Consensus on Climate Change”.

formation of the International Governmental Panel on Climate Change.²⁰ All 52 members of this group—including Exxon, Shell Oil, and the American Petroleum Institute—sought similar goals of halting climate change regulations and spreading climate change misinformation.²¹ To achieve these goals, they lobbied the government and funded many conservative think tanks and Republican politicians to promote their messaging. This group was very successful; however, the group disbanded in 2002. This was likely prompted by the outcome of the Tobacco Master Settlement Agreement in 1998. Overwhelmed by lawsuits for lying about the health effects of cigarettes, the major producers of cigarettes petitioned the government to create a settlement to bypass the lawsuits against them. This settlement was extremely costly, though, and “cigarette makers were severely restricted from advertising their products and forced to pay over \$206 billion in damages”.²² Oil companies likely watched this settlement closely and realized they might be targeted next for their collective promotion of misinformation.

Many members of the Global Climate Coalition remained active, however, in funding misinformation, only now they do it more covertly and try to appear removed from spreading or creating misinformation. An oil actor will fund a conservative

²⁰ “Global Climate Coalition.” DeSmog, <https://www.desmog.com/global-climate-coalition/>. Accessed 16 March 2023.

²¹ Ibid.

²² Dembicki, *The Petroleum Papers*, 97.

foundation or think tank who in turn will fund smaller actors like contrarian scientists and politicians.²³ They also independently engage in lobbying efforts. These groups overall prefer to support Republican politicians over the Democrats—donating 15 times more visible funds to Republicans in the 2016 election cycle.²⁴ Intensive lobbying efforts have caused climate change to become a partisan issue to interfere with climate regulation legislation. These are some examples of how these companies have developed means to impact both the political and public discussions on climate change while remaining partially hidden from the public eye.

International Struggles

While the US is a leader in the United Nations and highly involved in foreign affairs, our government has had difficulty agreeing to long-term international climate

²³ Shaun Elsasser and Riley Dunlap. “Leading Voices in the Denier Choir: Conservative Columnists’ Dismissal of Global Warming and Denigration of Climate Science.” SAGE Publications Inc, 28 December 2012, <https://doi.org/10.1177/0002764212469800>.

²⁴ Tom McCarthy and Lauren Gambino. “The Republicans who urged Trump to pull out of Paris deal are big oil darlings.” The Guardian, 1 June 2017, <https://www.theguardian.com/us-news/2017/jun/01/republican-senators-paris-climate-deal-energy-donations>. Accessed 11 April 2023.

agreements.²⁵ In fact, the US for a long time had been the leading contributor to global warming until 2006 when US emissions were surpassed by China.²⁶ Still, the US remains the second greatest emitter and stands to lose more than other countries if the US agrees to comprehensive carbon restrictions. Further, US GDP is projected to be somewhat insulated from the financial harms of climate change.²⁷ This is because climate change will exacerbate existing developmental issues and issues of inequality. Also, the sub-tropics and tropical areas will face greater harms than colder regions as their average temperatures rise beyond suitable levels for life and agriculture.²⁸ While scientific projections show that the US will be impaired by the oncoming effects of climate change, it is predicted that the US will be more resistant to those initial challenges because of US wealth and location²⁹. The harms of climate change across the globe are showcased in the figure below.

²⁵ Christopher Hobson (2012) Addressing climate change and promoting democracy abroad: compatible agendas?, *Democratization*, 19:5, Page 975, DOI: 10.1080/13510347.2012.709691.

²⁶ *Ibid* 978.

²⁷ Philipp Bothe, Lucas Chancel, and Tancrède Voituriez, (2023) *Climate Inequality Report 2023*, World Inequality Lab Study 2023/1: Page 4.

²⁸ *Ibid*, 4.

²⁹ *Ibid*, 4.

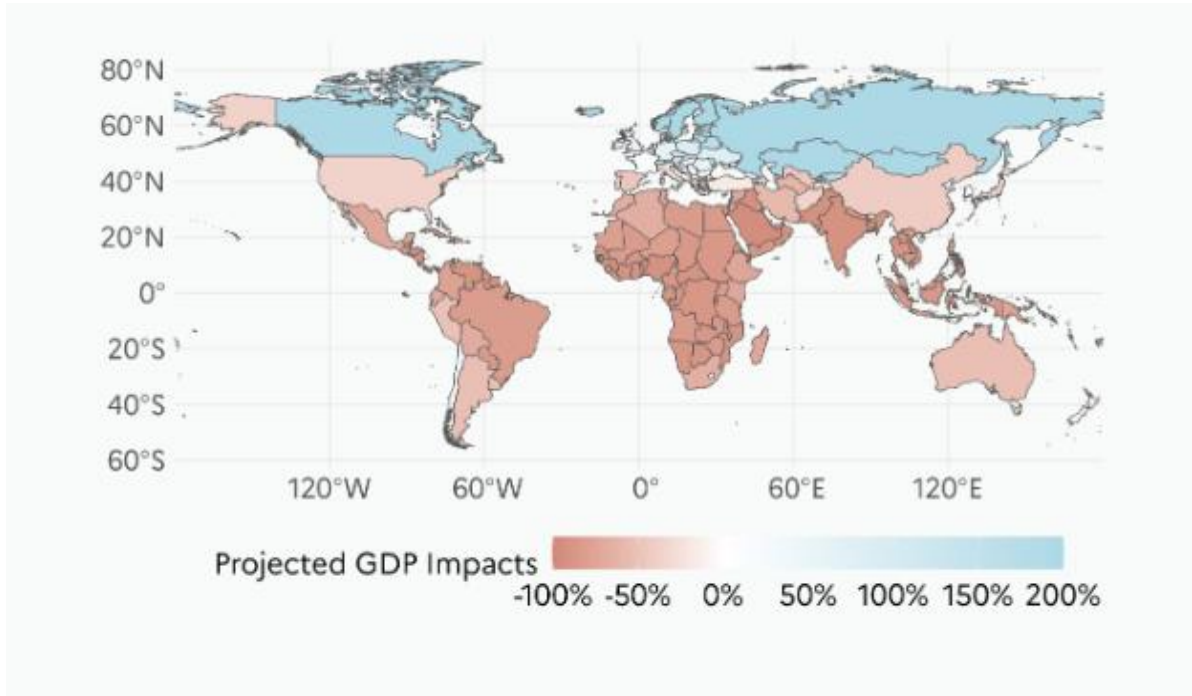


Figure 2 Global map of the estimated impact climate change will cause in GDP per capita by 2100. Chancel, *Climate Inequality Report 2023*, Page 8.

Regarding the immediate harms of climate change, the US will be less affected despite being the second largest emitter. This is problematic because an initial lack of harm may disincentivize international action. Furthermore, global power politics and the rivalry between the US and China have made international cooperation difficult. China has become the largest emitter of coal and continues to increase emissions because of its coal-based policy.³⁰ China only surpassed the US in emissions in 2006 however, while the US has been the leading emitter for decades. This has caused

³⁰ Hobson, *Addressing climate change and promoting democracy abroad*, 978.

problems as many want the US to maintain a hard stance against China while others criticize the US for limiting China's development while the US got to emit CO2 freely for years.³¹ While there are also multiple benefits of the US engaging in climate agreements, these are largely ignored as lobbyists have amplified concerns over power politics and China to mobilize public opinion against international climate agreements.

Although China is now the largest producer of carbon emissions, they are also a leading force in renewable energy research and infrastructure. They even have surpassed the US in having the greatest "capacity of renewable energy, and are continuing to invest heavily in this field".³² This development is occurring so rapidly that economists predict that China's "emissions of greenhouse gases will likely peak by 2030 – and its energy use will approach a plateau by 2030 to 2035".³³ China still has much to do and still produces the majority of greenhouse gas emissions of all countries, but this development highlights how the framework of modern power politics is shifting and how renewable energy will be a key facet of power politics in the future. Despite this, the US has a poor record with multilateral agreements because of the oil lobby.

³¹ Helen Regan, Carlotta Dotto, Marco Chacon, and Henrik Pettersson. "US vs. China: How the World's Two Biggest Emitters Stack up on Climate." CNN. Cable News Network, November 3, 2021. <https://www.cnn.com/2021/10/28/world/china-us-climate-cop26-intl-hnk/index.html>.

³² Hobson, *Addressing climate change and promoting democracy abroad*, 982.

³³ *Ibid*, 982.

The first major challenge against US involvement in international climate agreements occurred in anticipation of the Kyoto Protocol Agreement. At the 1995 Berlin Conference President “Clinton had agreed during those talks to give China, India, and other developing countries more leeway as a matter of fairness”.³⁴ West Virginia Democratic senator Robert Byrd noticed this, and, motivated by his states’ coal interests, put forward a resolution preventing any sort of leeway to China in the agreements in July 1997. Instead of arguing about the importance of coal, however, he argued that any agreement which gave special boons to China would “result in serious harm to the economy of the United States”.³⁵ The Global Climate Coalition-sponsored Republican senator Chuck Hagel also voiced support and helped the bill pass.³⁶ This bill severely limited the US’ options and led to the US refusing to sign the 1997 Kyoto Protocol.³⁷

Lobbyist interference has continued and was intensified in 2017. At this time, oil interests also successfully motivated US President Donald Trump to withdraw from the Paris Climate Agreements through intense lobbying efforts. The Trump administration already had close ties with the fossil fuel industry—especially with the

³⁴ Dembicki, *The Petroleum Papers*, 86.

³⁵ *Ibid*, 86-87.

³⁶ *Ibid*, 87.

³⁷ Hobson, *Addressing climate change and promoting democracy abroad*, 978.

petrochemical company Koch Industries.³⁸ However, Trump was initially hesitant to back out of the Paris Climate Accords as it would elicit a negative international response. Oil interests were able to persuade Trump to take action by having 22 Republican Senators sign off on a letter urging Trump to withdraw.³⁹ These 22 senators have reportedly received over \$10 million from oil, gas, and coal interest groups since 2012 and have long been advocating for these companies.⁴⁰ This letter provided political cover that could distance Trump from potential backlash. While US President Joe Biden rejoined the Paris Agreement on his first day in office in January 2021, Trump's withdrawal greatly delayed action to regulate gas emissions in the US and made it harder for the US to meet our promised emission targets.⁴¹ Thus, fossil fuel interests have had great success in thwarting US involvement in international

³⁸ Hai-Bin Zhang, Han-Cheng Dai, Hua-Xia Lai, Wen-Tao Wang, U.S. withdrawal from the Paris Agreement: Reasons, impacts, and China's response, *Advances in Climate Change Research*, Volume 8, Issue 4, 2017, Pages 220-225, ISSN 1674-9278, <https://doi.org/10.1016/j.accre.2017.09.002>.

³⁹ McCarthy, "The Republicans who urged Trump to pull out of Paris deal".

⁴⁰ Ibid.

⁴¹ Antony Blinken. "The United States Officially Rejoins the Paris Agreement - United States Department of State." *State Department*, 19 February 2021, <https://www.state.gov/the-united-states-officially-rejoins-the-paris-agreement/>. Accessed 11 April 2023.

agreements over the last several decades and delaying US action to regulate carbon dioxide emissions.

Media

In addition to lobbying, fossil fuel interests have used the media to great effect to confound the public. Despite the overwhelming consensus on the issue of climate change, fossil fuel interests have widely promulgated climate change misinformation to make it seem that the issue is still disputed. Thus, the dissenting view has taken disproportionate control of the media. The media most influenced by fossil fuel companies and those discussed in this paper includes news articles and Google searches. The overrepresentation of the dissenting view can be seen in multiple ways. Articles that voice the opinions of two mainstream climate scientists in contrast to one dissenter would more accurately depict the current debate by quoting “30 or 40 mainstream scientists for every dissenter”.⁴² Similarly, researchers in 2015 found that “only 30% of middle-school and 45% of high-school science teachers were aware that the scientific consensus is above 80%, with 31% of teachers who teach climate change presenting contradictory messages that emphasize both the consensus and the minority

⁴² Oreskes, “Scientific Consensus on Climate Change”.

position”.⁴³ Fossil fuel interest groups have achieved this by shifting the debate about the feasibility of climate change from scientific discussion into public discussion.

One prime example of how fossil fuel interest groups have carried this out is the Koch Industries-funded conservative think tank Cato Institute. Charles Koch founded this think tank and funded it with about \$20 million of his private funds in the mid-1970s to challenge the scientific backing of climate change.⁴⁴ This group included the campaigns of other fossil fuel interest groups. One such group, the Southern Energy and Edison Electric Institute, ran a campaign to “Reposition global warming as theory (not fact)”.⁴⁵ They hired biological sciences professor Patrick Michaels from the University of Virginia as a figurehead to carry out this agenda.⁴⁶ This strategy became the norm for oil producers after the 2000s, as direct involvement in disputing science was becoming more of a liability.

This strategy was predicated on misrepresenting the scientific understanding of climate change because at this point climate scientists largely agreed that climate change exists. Nine hundred and twenty-eight of the top sampled papers published Between 1993-2004 discussing global climate change all supported the correlation

⁴³ Cook, “Consensus on Consensus”.

⁴⁴ Dembicki, *The Petroleum Papers*, 77.

⁴⁵ Ibid, 78.

⁴⁶ Ibid, 78.

between man-made gas emissions and the rise in climate.⁴⁷ Yet fringe contrarian scientists have denied this overwhelming majority and continue to act as if this issue is still up for discussion. One way to demonstrate this is to showcase how very few dissenting voices have sufficient qualifications or research to support their arguments. This is evident in various reports of the consensus on climate change among scientists. The figure below reveals this trend by showing the relationship between a report's measure of consensus and how selective that report was. It showcases how consensus reports published from 2006-2016 that boast a low consensus included the opinions of those who lack expertise while those that report a higher consensus were stricter in their sampling.

⁴⁷ Oreskes, "Scientific Consensus on Climate Change".

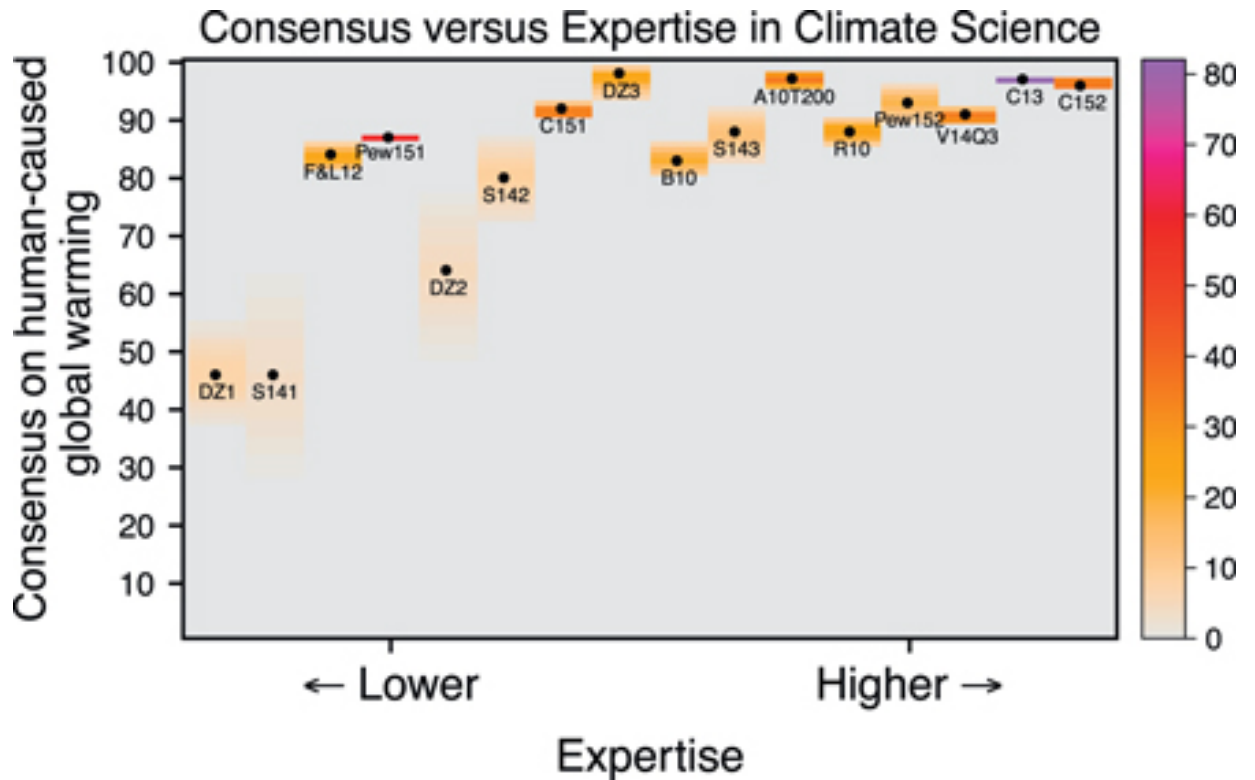


Figure 3 Chart measuring the relationship between reported level of consensus among scientists and expertise required in sampling methods. Cook, “Consensus on Consensus”.

For example, Anderegg’s report found that 66% of climate scientists agreed that human emissions were causing climate change in 2010. However, those surveyed that disagreed lacked the same credentials as those that believed in climate change—about one-third of those that disagreed had no Ph.D. and very few had a Ph.D. relating to climate studies.⁴⁸ When these unqualified responses were struck from the collection

⁴⁸ Cook, “Consensus on Consensus”.

Anderegg's consensus rose to 97%-98%.⁴⁹ This study, then, demonstrates how scientific consensus on this issue has been muddied by the opinions of non-experts.

Despite this unsound basis, the opinions of these non-experts are promoted on various conservative news websites. These sites use these arguments reactively to impede efforts to address climate change and influence the public during critical moments. The publications of conservative news site—www.townhall.com—were studied to showcase how contrarian news often reactively publish articles.⁵⁰ They analyzed the publications of this site by using climate-related keywords and recording when a climate-related article was published. The Y axis describes the number of articles published within a given period while the X axis describes the date an article was published.

⁴⁹ Cook, "Consensus on Consensus".

⁵⁰ Elsasser, "Leading Voices in the Denier Choir".

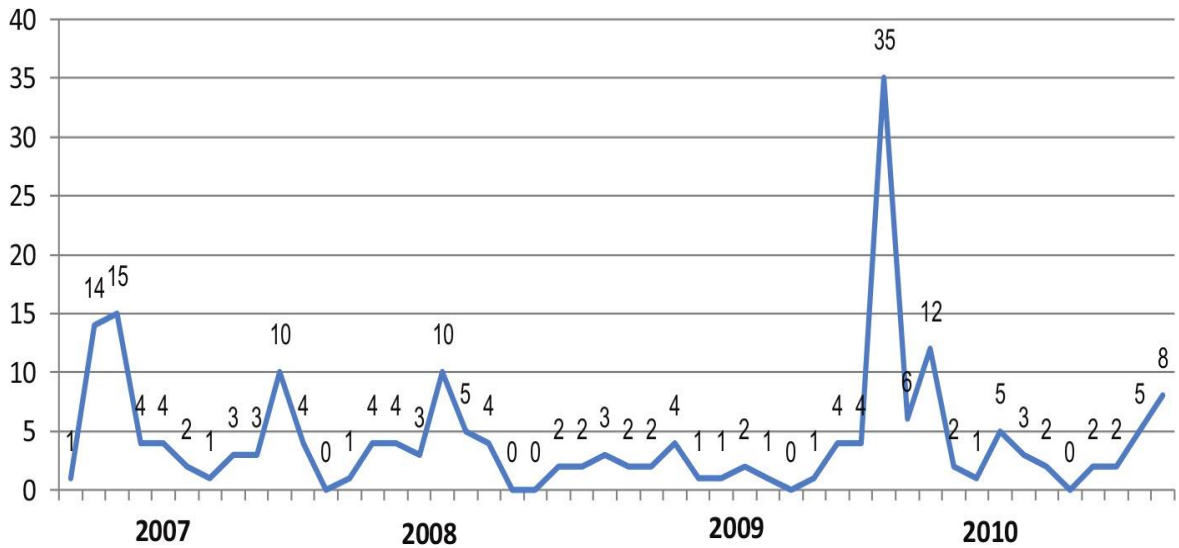


Figure 4 Chart showing the frequency of contrarian climate change publications made by www.townhall.com. Elsasser, "Leading Voices in the Denier Choir".

This graph demonstrates how fossil interests use media articles to disrupt climate change momentum. The first peak in publications in 2007 was in reaction to when former Vice President and climate change activist Al Gore won an Oscar.⁵¹ Since Gore was a prominent environmentalist, these conservative news sites sought to disrupt his recognition. The second peak occurred in November 2007 in response to Gore and the Intergovernmental Panel on Climate Change being nominated for the Nobel Peace Prize. Again, columnists announced that this sort of recognition was undeserved. The third Peak in 2008 was in response to the conservative think tank the

⁵¹ Elsasser, "Leading Voices in the Denier Choir".

Heartland Institute's 2008 International Conference on Climate Change".⁵² While this surge was not in response to some major climate-related event it did serve to promote the arguments of contrarian scientists. The fourth peak was in 2009. This spike was driven both by the Climategate scandal and the international summit COP 15. The Climategate scandal was when 1,000 emails between scientists from the University of East Anglia in the UK were leaked. Many articles were published misrepresenting these emails and proposing that scientists have fabricated the entire idea of climate change.⁵³ This gave conservative sites powerful tools to lambast President Obama's involvement in COP 15 which sought to strengthen the Kyoto Protocols. These records reveal how fossil interests utilize online news to impose the contrarian view in public discussion and diminish the arguments of climate scientists and interrupt the momentum of climate activists.

Finally, to ensure contrarian articles are read by the public these companies pay newspapers and search engines to present them as advertisements. Exxon employed this strategy to great effect from the late 1990s to the 2000s by buying advertisements in the New York Times which they stylized to look like newspaper columns.⁵⁴ From 2020-2022 ExxonMobil, British Petroleum, Chevron, Shell, and

⁵² Elsasser, "Leading Voices in the Denier Choir".

⁵³ Ibid.

⁵⁴ Oreskes, "Scientific Consensus on Climate Change".

Aramco spent \$23.7 million on Google search ads, with half of that fund targeting searches related to environmental sustainability (“Greenwashing on Google” 4). This is alarming because “68% of users are unable to spot the difference between ads and organic search results” which means many are unaware that they are reading propaganda.⁵⁵ While many of these companies pay to advertise constantly, this strategy can also be used reactively. When Dutch Climate Activists announced they were suing Shell over their emissions the company increased their advertising efforts the following month, spending “over \$1 million dollars on Google Search ads, 62% of which accounted for greenwashing ads”.⁵⁶ ExxonMobil alone spent \$4 million on promoting their advertisements during 2020-2022 on searches relating to sustainability. This strategy has had a great effect and it is estimated that people from the US viewed these advertisements over 58 million times.⁵⁷ Google in 2021 banned “content that contradicts well-established scientific consensus around the existence and causes of climate change” but still continues to accept money and promote the

⁵⁵ “Greenwashing on Google: How Google Profits by Cleaning Big Oil's Reputation.” Center for Countering Digital Hate | CCDH. CCDH, November 2, 2022. Page 5 <https://counterhate.com/research/greenwashing-google-big-oil/>.

⁵⁶ Ibid, 18.

⁵⁷ Ibid, 11.

advertisements of these companies.⁵⁸ These paper trails highlight the deep involvement oil companies have in promoting climate misinformation.

⁵⁸ Ibid, 11.

Evolving Narrative - Various Forms of Climate Opposition

Armed with prior research, a substantial influence over the government, and a network to distribute media, oil producers dominated the discussion of climate change in the early 1990s and 2000s. However, as scientists, politicians, and activists have challenged climate misinformation, fossil fuel interest groups have been forced to change their narrative. This strategy has caused the development of multiple different claims about the importance of climate change and the feasibility of addressing it. All of these arguments against climate change have been well promoted and often resurface despite the overwhelming evidence against them. The various arguments are covered in greater detail below.

Climate Denial

The first major strategy was outright climate denial. This argument sought to undermine the argument of the scientific community completely. This strategy was employed mainly during the early stages of climate change discussion during the 1990s as the public was mostly unaware of the issue. This strategy is still employed often, however. At the start of February 2023, the Koch industries funded conservative think-tank the Heartland Institute wrote and distributed 8,000 copies of its science textbook *Climate at a Glance* to grade school teachers in the US so they could teach

their students “the data to show the earth is not experiencing a climate crisis”.⁵⁹ Similarly, Republican Senator James Inhofe in 2015 brought a snowball onto the Senate floor as evidence that climate change is not real since Washington became cold enough for snow to form.⁶⁰ While both of these efforts were easily overturned, it is important to recognize how they may still influence the public because of the radical flank theory. This theory claims that by proposing an absurd argument, you can shift the perspective around an issue to make another claim seem more moderate and gain greater support. The persistence of this argument despite the overwhelming evidence provides greater support to this theory.

Climate Deflection

Supporters of this argument claim that climate change is real, but not caused by humans. In comparison to climate denial, this argument cedes ground in admitting that the global temperature is increasing but argues that this is due to natural variability rather than because of carbon emissions. The argument is more resilient

⁵⁹ Blanca Begert and Ysabelle Kempe. “Heartland Institute sends 8,000 teachers climate denial ‘textbook.’” *Grist*, 6 February 2023, <https://grist.org/science/climate-denial-campaign-goes-retro-with-new-textbook/>. Accessed 7 February 2023.

⁶⁰ Nicky Woolf. “Republican Senate environment chief uses snowball as prop in climate rant.” *The Guardian*, 26 February 2015, <https://www.theguardian.com/us-news/2015/feb/26/senate-james-inhofe-snowball-climate-change>. Accessed 17 March 2023.

because the global temperature does vary, the key fault is that this variability is occurring alongside human-caused climate change.⁶¹ This argument was promoted widely by the Global Climate Coalition in anticipation of the Kyoto Protocols. The group bought out full pages in the New York Times disputing climate change and pointing readers toward a website called Climate Facts.⁶² That website featured articles about “conflicting data over whether there is a warming trend” and how “the sun may be playing a larger role in the Earth’s climate than was previously suspected”.⁶³ This type of argument was more nuanced than outright denial and aimed to sow doubt by arguing that data supporting climate change was far from conclusive. This makes these arguments more difficult to overcome because of how they weave in truths about the environment in between the lies.

Climate Change Minimization

This strategy proposes that climate change is caused by humans but is not a significant problem. The foremost argument in this category is that climate change is not more important than the economy and that because climate change regulations

⁶¹ Oreskes, “Scientific Consensus on Climate Change”.

⁶² Dembicki, *The Petroleum Papers*, 83.

⁶³ *Ibid*, 84.

would hurt the economy, they should not be pursued. This claim has become the “Big Lie of the climate debate and the signature achievement of the opponents of action” as economic harm has significant weight over the American public.⁶⁴ This strategy was visibly impactful in 2010 when Koch Industries stopped the passage of Obama’s cap and trade bill which aimed to force polluters to pay for their emissions.⁶⁵ Americans for Prosperity—a far-right political organization funded by Charles and David Koch—created a \$140,000 advertising campaign saying climate change legislation would cause massive unemployment and raise energy bills.⁶⁶ Charles Koch also funded the “Tea Party” movement—which sponsored 129 Republicans “running for the House and nine for the Senate”.⁶⁷ Through this approach, Koch Industries were able to both stir public uncertainty about the bill and place influential politicians in government to invoke that strife—causing the bill to lose all momentum and fail.

The reason this argument is so impactful is that there is truth to it. Governmental regulations will deliver massive losses to carbon-emitting industries and raise the prices of their goods accordingly. What these companies fail to mention, however, is that the economic benefits produced by these regulations will counteract

⁶⁴ Dembicki, *The Petroleum Papers*, 87.

⁶⁵ *Ibid*, 139.

⁶⁶ *Ibid*, 140.

⁶⁷ *Ibid*, 141

those losses. This phenomenon has been observed in the effect regulations had on other environmental crises. A study of the economic impact of the Montreal Protocol regulations on Aerosols found that the “economic benefits exceed costs by some \$224 billion”.⁶⁸ And while coal-burning electric utilities argued that regulations aimed to reduce toxic rain would cost the industry \$7 billion per year, “when you factored in the improvements to public health and local ecosystems of keeping toxic chemicals out of communities, lakes, forests, and people’s lungs, the acid rain legislation led to an estimated \$119 billion in net benefits annually”.⁶⁹ In regards to climate change, however, the fossil fuel industry have done much to hide the potential benefit of climate change-related regulation. Exxon subsidiary Imperial Oil calculated that a carbon tax in Canada would cost their government \$100 billion.⁷⁰ This calculation did not make any note of the possible benefits of investing in green energy yet was directly mentioned in Canada’s report to the UN on climate change in 1994. Ultimately this sort of argument falls flat because climate change is a major issue that threatens the well-being of all life. Additionally, carbon regulations will likely bring economic benefit for the average person rather than harm. The difficulty comes in

⁶⁸ Dembicki, *The Petroleum Papers*, 87.

⁶⁹ *Ibid*, 81.

⁷⁰ *Ibid*, 88.

overcoming the entrenched argument that it will cost us more money to fix this issue than to ignore it.

This category also involves discourse of delay. This strategy is centered on “publicly accepting the science but working to stall climate policy by redirecting blame, pushing non-transformative solutions, and emphasizing the downsides of taking action”.⁷¹ In the advertisements Exxon bought in the New York Times discussed earlier, Exxon “suggested that climate science was far too uncertain to warrant action on it”.⁷² These headlines implied that any action now would be premature, even though the existing research at this point warranted and recommended an immediate response. Thus, they encouraged the public to take the issue slowly and continue to allow companies to emit freely. All these strategies encourage consumers to wait which is dangerous considering the urgency of climate change.

Greenwashing

This strategy is prevalent today and has become the foremost strategy of companies that cause the most damage to the environment. To distract consumers from this, companies push advertising and public messaging to appear climate-friendly

⁷¹ Begert, “Heartland Institute sends 8,000 teachers climate denial ‘textbook.’”.

⁷² Oreskes, “Scientific Consensus on Climate Change”.

and environmentally sustainable.⁷³ These messages are often promoted in the Google search advertisements mentioned before despite contradicting to the company's internal actions. For example, ExxonMobil spent \$144,904 on advertising expressing their support for the Paris Climate Agreements. This support does not mean they will abide by the regulations of such an agreement though, as the company plans to continue to invest "\$20-25 billion in capital and fossil fuel exploration expenditure every year through to 2025".⁷⁴ These empty commitments are key in greenwashing as companies will agree to almost anything while planning and acting to do the opposite. Shell also placed advertisements of their commitments on Google search results. They spent \$181,784 on ads that claimed that Shell was working towards creating a "net-zero emissions world" while at the same time internally stating that net-zero is "not a Shell business plan".⁷⁵ Shell has recently changed their tune and has committed to net-zero emissions but still promises to do very little. Their goal for achieving net-zero is 2050—a date very far off especially considering the urgency of the issue of climate change. Their inaction regarding this target is made explicit in a minimized legal disclaimer on their website, where they state "Shell's operating plans cannot reflect our 2050 net-zero emissions target and 2035 NCF target, as these targets are currently

⁷³ "Greenwashing on Google", 8.

⁷⁴ "Greenwashing on Google", 8.

⁷⁵ Ibid, 19.

outside our planning period”.⁷⁶ Shell is a prime example of how oil companies are committing to climate pledges to appear more environmentally friendly while mobilizing to increase or maintain their emissions.

The creation and promotion of all these various arguments against climate change have produced the effect fossil fuel interests hoped for—the disorientation of the American public. The reason why the American public has had such great difficulty overcoming this issue is not that they “couldn’t hear the whistle of an approaching crisis; it was that they were being blasted with distracting noises from every possible direction”.⁷⁷ The introduction of such varied arguments for and against climate change has shifted this issue far from any consensus, especially the consensus found among scientists. In addition, correcting the damage will be especially difficult due to the persistence of climate change misinformation within the conservative echo chamber. Although the conservative “featured narrative is constantly changing in response to criticism,” those caught in the echo chamber will often latch onto what they initially heard, despite the arguments against their views.⁷⁸ This leaves many

⁷⁶ “Achieving net-zero emissions.” *Shell Global*, <https://www.shell.com/powering-progress/achieving-net-zero-emissions.html>. Accessed 16 April 2023.

⁷⁷ Dembicki, *The Petroleum Papers*, 89.

⁷⁸ Elsasser, "Leading Voices in the Denier Choir".

susceptible to the strategies of fossil interest groups. This threat is distinct from the issue of climate change and emphasizes the need for greater punishments for corporate lies and manipulation.

Policy Recommendations and Predictions

How to address misinformation

One possible solution to this issue of misinformation is the pursuit of higher education. Surveys conducted by Yale highlight how those who receive a bachelor's degree are far more likely to believe that climate change is happening than those who have only a high school degree.

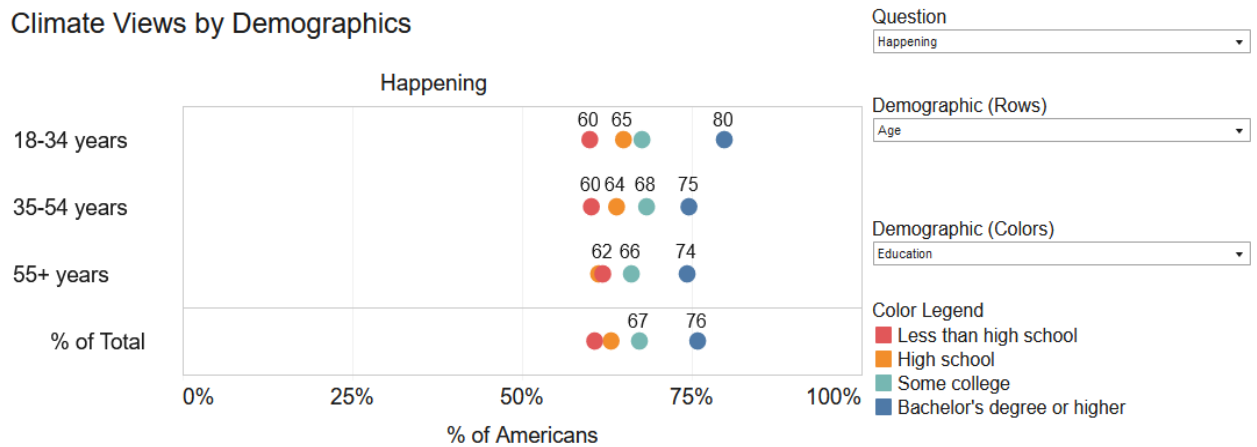


Figure 5 Chart showing the results of Yale’s National Climate Opinion Polls according to education demographics. Marlon et al. “Explore Climate Change in the American Mind.” Yale Program on Climate Change Communication, December 15, 2022. <https://climatecommunication.yale.edu/visualizations-data/americans-climate-views/>.

This finding tracks alongside comparisons of both age and political association, highlighting how greater education may arm people to see through climate misinformation.⁷⁹ Across every age group each additional level of education promoted the development of critical thinking, research skills, or exposure to scientific studies that enabled more people to see through climate misinformation. Overcoming misinformation may not even be necessary to win the support of uneducated voters for climate-related policy. Special framing for the benefits of investing in clean energy, such as “a way to reduce U.S. dependence on Middle Eastern oil and prevent the country from losing out on clean energy jobs to China” has the potential to gain bipartisan support even among those who do not believe fully in the issue of climate change.⁸⁰ Overall, the abundance of climate change misinformation calls for a greater focus on education, which includes teaching how to recognize misinformation and how to fact check.

⁷⁹ Marlon, Jennifer, Matthew Ballew, Seth Rosenthal, Edward Maibach, and Anthony Leiserowitz. “Explore Climate Change in the American Mind.” Yale Program on Climate Change Communication, December 15, 2022. <https://climatecommunication.yale.edu/visualizations-data/americans-climate-views/>.

⁸⁰ Dembicki, *The Petroleum Papers*, 139.

Strategies for Climate Regulation

Similarly, regulations can be shaped to benefit the public. A carbon tax can be modified to place a burden on industries that fail to lower emissions while insulating Americans from the associated increased costs. Norway shaped its carbon tax in this fashion and offered nearly \$80,000 USD to each Norwegian as a refund for their increased carbon tax on offshore drilling in 2007.⁸¹ Germany took a different approach and transferred their carbon tax revenue into the public pension system to lower the contributions required by employers and stimulate job growth.⁸² These successful examples of carbon taxes abroad should be both used as a model for a US carbon tax and an example of how regulations may enhance our economy.

Another economic strategy is to have Differential Taxation to incentivize cleaner energy production. In this strategy, renewables would have a total exemption, hybrid energy investments would face some middling tax and traditional carbon-emitting sources would have the greatest tax. This tax would incentivize investment in renewables, potentially finance the creation of renewable sources of energy with tax

⁸¹ Geroe, Steven. "Addressing Climate Change through a Low-Cost, High-Impact Carbon Tax." *The Journal of Environment & Development* 28, no. 1 (2019): Page 15. <https://doi.org/10.1177/1070496518821152>.

⁸² *Ibid*, 6.

revenue and ween the US off our reliance on carbon-emitting energy sources as they become less and less competitive.⁸³

Lawsuits

While fossil fuel interest groups were successful in confounding the American public, they were unable to hide their involvement in promoting misinformation. Exxon is being sued for knowing about climate change and spreading misinformation. While the courts are unable to undo the harms of climate misinformation, they can charge Exxon and other companies for knowingly promoting misinformation which may dissuade them from doing so in the future. The primary challenges of this strategy are that lawyers must overcome a judicial system heavily influenced by fossil fuel lobbyists and convince courts to pass punishments that outweigh the benefit these companies receive from polluting the environment. While lawsuits against these companies have been made since as early as 2005, only recently have they begun to gain more credibility. This is due to the development of science regarding climate change and the increased volume of lawsuits. Climate scientist Richard Heede published a study in 2013 that mapped and quantified the emissions of the largest 90 carbon producers from 1854-2010—highlighting how the emissions of these

⁸³ Ibid, 18.

companies can be traced.⁸⁴ Climate scientists have also achieved major developments in attribution science. With these extensive records of companies' emissions, climate scientists can gauge how much impact the actions of one company had on "increases in atmospheric temperature," elevation of the sea level," and extreme weather events.⁸⁵ This key link may even make the precedent of lawsuits against tobacco companies apply as both tobacco companies and fossil fuel companies knew the harms of their product yet still promoted it. These developments are powerful tools that individuals can use to charge companies.

Harvard Law Review has also recognized these developments and proposes using them to charge oil companies with homicide.⁸⁶ They claim that just like other companies that cause unintentional deaths fossil fuel companies should be charged with homicide. Their impact in worsening natural disasters has been recorded and has contributed to the deaths of thousands of Americans. This strategy would also empower lawsuits against these companies because fossil fuel companies have extensively lobbied the courts and influenced the appointment of judges who have

⁸⁴ Geetanjali Ganguly, Joana Setzer, Veerle Heyvaert. "If at First You Don't Succeed: Suing Corporations for Climate Change." *Oxford Journal of Legal Studies*, vol. 38, no. 4, 2018, pp. 841-868, <https://doi.org/10.1093/ojls/gqy029>.

⁸⁵ Ganguly, "Suing Corporations for Climate Change".

⁸⁶ David Arkush and Donald Braman, Climate Homicide: Prosecuting Big Oil For Climate Deaths (January 23, 2023). Harvard Environmental Law Review, Vol. 48, No. 1, 2024, Available at <http://dx.doi.org/10.2139/ssrn.4335779>

blocked private civil suits from creating regulations.⁸⁷ This is because the federal courts hold that civil regulatory remedies against fossil fuel companies are preempted by the existing federal climate regulations, and as such state courts cannot regulate fossil fuel companies. This can delay or even stop a case by forcing the prosecution to appeal to federal courts and greatly limits the impact of civil lawsuits against these companies. This preemption does not apply to criminal regulations, however, which makes a criminal suit much more viable and likely to succeed.⁸⁸ A case for homicide cannot be dismissed as easily as a civil charge and a successful case for homicide also offers greater options to punish the corporation at fault. These options include fines, “property seizure, injunctive relief, compulsory program participation, mandated apologies, public shaming and, for humans, incarceration and even death”.⁸⁹ This is because criminal charges are more focused on regulating conduct than their civil counterpart which is focused on righting economic harms and only offers fines as compensation. The increasing efficacy of environmental lawsuits is a major development and shows how a government settlement punishing fossil fuel companies may be possible in the future.

⁸⁷ Ibid, 56.

⁸⁸ Arkush, *Climate Homicide*, 57.

⁸⁹ Ibid, 85.

Peak oil usage

While public concern may prove inadequate to stop oil consumption, the limiting factor of declining oil reserves will. Oil is a finite nonrenewable resource and is being used up. Petroleum geologist pioneer M. King Hubbert in 1956 was the first to predict “that oil production would peak when about half of the economically recoverable resource had been exploited”.⁹⁰ Contemporary geologists concur with this reasoning and hypothesize based on modern consumption levels that the world will reach this peak at some point before 2030.⁹¹ This event will surely cause the decline of oil production as oil extraction will become more difficult and expensive. Although the decline of oil production may seem advantageous to climate change regulation, the reality is that in our current energy climate oil companies greatly benefit from oil scarcity. This is highlighted by Exxon’s reported record profits this year—\$55.7 billion—due to Russia’s refusal to sell oil to the US because of US involvement in the Ukraine crisis.⁹² This highlights the importance of investment in renewables because as oil becomes more scarce oil producers gain greater leverage and market control.

⁹⁰ Pushker Kharecha and James Hansen, Implications of “peak oil” for atmospheric CO₂ and climate, *Global Biogeochem. Cycles*, 22, GB3012, doi:10.1029/2007GB003142.

⁹¹ *Ibid.*

⁹² Cathy Bussewitz. “Exxon Mobil reached record profits amid high gas prices, war in Ukraine.” *PBS*, 31 January 2023, <https://www.pbs.org/newshour/economy/exxon-mobil-reached-record-profits-amid-high-gas-prices-war-in-ukraine>. Accessed 4 February 2023.

Conclusion

Although the mechanisms of climate change and the need to reduce CO₂ emissions have been well known since 1995, climate change remains one of the greatest threats to the survival of mankind. Exxon, Shell, Koch Industries, and other fossil fuel companies took control of the narrative surrounding climate change and greatly contested climate change activists. Because of their concern for future environmental regulations which would damage profits, these companies were able to discover the threat of climate change before the scientific community. This enabled them to strategize and construct a plan to sabotage the public's ability to compel the government to address the issue and regulate CO₂ emissions.

Their first victory was shifting discussion of the issue from the scientific world to the general public. This allowed them greater control over the discussion through funding of think tanks, contrarians, false experts, and news sources. While many scientists would see through this misinformation, the public was widely influenced by it. This greatly harmed the momentum of climate change activist groups who had to contend with arguments whether climate change was even real, rather than arguments on how best to prevent it.

Their second victory was their infiltration and influence over the US government through intense lobbying and funding of the Republican politicians. This influence combined with their substantial media presence allowed fossil fuel interests to make climate change partisan to prevent and hinder the formation of climate legislation. This has also greatly harmed international efforts to address climate

change as the US has had trouble accepting multilateral agreements despite being the second largest carbon emitter.

As climate change misinformation is addressed and corrected, new narratives appear. This presents a problem for climate change activists, as positive action is constantly being impeded by misinformation campaigns. From climate denial to modern greenwashing, the public discussion on climate change has been muddied and misinformation will likely persist in the future due to fossil fuel companies' efforts and funding. However, the worst fear of fossil fuel interest groups has come to pass as climate change has become a leading issue and remains at the forefront of the minds of many. Overcoming fossil fuel companies' comprehensive misinformation campaigns remains a major challenge to addressing this issue; however, Americans every day are becoming more aware of the presence of misinformation and the urgency of climate change⁹³. Additionally, the greater documentation and records of corporate harm and willful deceit provide greater opportunities to sue these companies and hamper their misinformation production. Despite this, oil companies continue to promote misinformation and contribute to climate change, highlighting the need for greater public education about misinformation, and public mobilization seeking government regulation of carbon emitting companies

⁹³ Alec Tyson, Cary Funk, and Brian Kennedy, "What the Data Says about Americans' Views of Climate Change," Pew Research Center, May 4, 2023, <https://www.pewresearch.org/short-reads/2023/04/18/for-earth-day-key-facts-about-americans-views-of-climate-change-and-renewable-energy/>.

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