Climate Change: Fossil Fuel Companies' Responses

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Since 1880, the global ocean and land temperature has increased an average 0.13^{o}F each year; 2014-2018 were the five warmest years on record (NOAA, 2019). The share in the atmosphere of carbon dioxide, a greenhouse gas, has increased steadily every year. In September 2005 the level of CO_2 was at 380 ppm, and presently, in February 2020, its level has risen to 413 ppm. In the Arctic, the sea ice is receding while sea levels are continuing to rise (NASA, 2019a). Major sources of carbon dioxide emissions include the burning of fossil fuels: coal, oil, and gas (NASA, 2019b). The evidence of anthropogenic climate change is clear, but the question remains of what is being done to stop it.

How have fossil fuel companies responded to evidence of climate change and consequent public pressure? Exxon Mobil claims it is reducing climate change risks through policy, stakeholder engagement, climate risk oversight, and climate change research (Exxon Mobil, 2018). Chevron's Chairman of the Board and Chief Executive Officer, Michael K. Wirth, states in his chairman's letter that Chevron is "managing climate risks to our business and taking on new opportunities to reduce greenhouse gas emissions and develop lower-carbon energy" (Chevron, 2019). Shell Oil claims its goals include sustainability and that it has a plan to "increase transparency around the topic of climate change." The company recently committed to setting short-term targets to reduce the Net Carbon Footprint (Shell, 2018a).

A top shareholder of Exxon Mobil and Chevron, BlackRock Fund Advisors, recognizes the financial impacts of climate and sustainability risks and states it "manages one of the largest renewable power funds." BlackRock claims that it supports a transition to low-carbon energy (BlackRock, 2019). Another significant shareholder of both Exxon Mobil and Chevron, the

Vanguard Group, has an investment stewardship committed to long-term value (Vanguard, 2020). Glenn Booraem, Vanguard Investment Stewardship Officer, claims they "seek to reframe the conversation about sustainable investing." He asserts that "a company – including its oversight of material environmental and social risks – should be aligned to create sustainable value long into the future" (Vanguard, 2019b).

But these companies' critics dispute them. The global movement #FridaysForFuture, inspired by Greta Thunberg, led to protests calling for action on global warming. In a speech to Congress, Thunberg called for "governments, political parties and corporations [to] grasp the urgency of the climate and ecological crisis." She demanded steep cuts in carbon dioxide emissions (Thunberg, 2019). The #ExxonKnew movement emerged following reports that Exxon Mobil has known about climate change for almost half a century: "Exxon intentionally misled the public about climate change and fossil fuels…[we're] calling for an immediate investigation" (Exxon Knew, 2020).

The response of fossil fuel companies to climate change can be distinguished using two classes: that which is presented to the general public and policymakers as responses to the ecological crisis and those presented to shareholders and investors in response to the business threat. This distinction is essential as these groups have very different goals in mind, yet corporations are striving to please both with their actions regarding climate change mitigation. The public and environmental advocates want to see drastic changes in emissions from fossil fuel companies, while shareholders and investors of these same companies desire solutions which are profitable and sustainable for the long-term.

Fossil fuel companies acknowledge the significance of climate change and emphasize their commitment to help combat it. Through participation in in-house research, development of

lower carbon techniques, emission goals, policy efforts, and investment in climate groups, these companies are striving to present themselves as responsible corporate citizens.

Review of Research

Ayling and Gunningham (2015), Bergman (2018), Green (2018), Healy and Debski (2017), and Bauer et al (2018) all analyzed the fossil fuel divestment movement and its strategies to deter investment in fossil fuel stocks in favor of climate-friendly alternatives. Ayling and Gunningham (2015) found that the movement's confrontational strategies and planned, high-profile events have attracted publicity, and contends that its complex aims are less about achieving actual divestment than raising public attention to climate change. Bergman (2018) found the direct impacts of divestment to be small, but the indirect cultural impacts on the public to be substantial, empowering its participants and influencing investors' and shareholders' demands. Green (2018) argues that influential groups have promoted anti-fossil fuel norms (AFFNs), including divestment, and argues that the movement is likely to spread further in the United States and worldwide. Healy and Debski (2017) find that in higher education, the fossil fuel divestment movement has been effective and note that it is pushing institutions to be more proactive and have a politicized focus within the fossil fuel economy. Bauer et al (2018) apply two energy-economy models to examine the divestment movement and the "green paradox," in which carbon emissions increase in response to a future climate policy, concluding that the divestment movement creates an anticipation effect that influences later policy implementation and ultimately prevails over the "green paradox" effect. These researchers consider the divestment movement in relation to fossil fuel companies, but did not account for the actions of fossil fuel companies in response.

Nasiritousi (2017) examined the climate change responses of the world's 10 largest oil and gas companies, finding active engagement by many in governance to influence policymakers and introduce energy efficient mitigation measures, but to various degrees. Effective climate change action was scarce. Her focus was on governance activities of fossil fuel companies, not to the impact of public pressure on their response. Heede (2014) traced carbon dioxide and methane emissions to the leading fossil fuel and cement producers from 1854 to 2010. He concludes that "nearly two-thirds of historic carbon dioxide and methane emissions can be attributed to 90 entities," with implications for current public policy. Heede does not take into account the responses of fossil fuel companies to such evidence.

Pressure

Fossil fuel companies have been under significant public pressure about global climate change. Greta Thunberg started the global movement #FridaysforFuture in August 2018 when she protested against the failure to act on the climate crisis in front of the Swedish Parliament for three weeks, and her actions went viral on social media. Thunberg has since continued to strike every Friday, along with many others all over the world, demanding governments take the severity of climate change seriously and conform policies to the Paris Agreement (Fridays for Future, 2020). In a speech before the United States Congress, Thunberg urged "governments, political parties and corporations [to] grasp the urgency of the climate and ecological crisis" and demanded steep cuts in carbon dioxide emissions (Thunberg, 2019). The #ExxonKnew campaign stemmed from the publishing of internal Exxon Mobil reports in 2015, demonstrating its knowledge of the threat of climate change decades ago. The movement claims that "Exxon knew about climate change half a century ago," and, "deceived the public, misled their shareholders,

and robbed humanity of a generation's worth of time to reverse climate change." The movement unites fourteen participating groups including the Union of Concerning Scientists, Corporate Accountability International, and Greenpeace USA; they demand that Exxon be investigated (Exxon Knew, 2020). The public outcry has put fossil fuel companies, including Chevron, Exxon Mobil, and Shell Oil, under fire.

Shareholders of fossil fuel companies have an immediate financial interest in the climate change crisis, and influence fossil fuel companies' actions and decisions. The Vanguard Group is a top shareholder of both Exxon Mobil and Chevron and has claimed to favor sustainability and climate change mitigation. It has growing investments in "ESG," which blends "environmental, social, and governance factors into traditional investment evaluations;" ESG consists of over 350 funds (Vanguard, 2020). Vanguard claims its fund managers "consistently engage with portfolio companies about climate risk, especially companies in carbon-intensive industries" and that in 2019 they discussed long-term sustainability risks with over 258 carbon-intensive industry companies (Vanguard, 2019a; 2019b). Vanguard and its investors claim to value climate action and have demanded responses to climate change from fossil fuel companies. BlackRock Fund Advisors is another top shareholder of both Exxon Mobil and Chevron, and states it is "putting sustainability at the center of how we invest" through sustainability-integrated portfolios (BlackRock, 2020). It reports that climate change is its clients' biggest issue, and thus demand transparency from companies about sustainability through the use of Sustainability Accounting Standards Board (SASB), reporting (Fink, 2020). BlackRock has put sustainability at the forefront, and consequently expects the same in the companies that they are invested in. Shareholders, such as the Vanguard Group and BlackRock Fund Advisors, are contributing to the pressure which fossil fuel companies are facing in their response to climate change.

In-House Research

Fossil fuel companies have emphasized their participation in research both past and present. Exxon Mobil states at the top of its climate change webpage that its "scientists have been involved in the forefront of climate research for four decades, understanding and working with the world's leading experts" (Exxon Mobil, 2020a). Now available on the company website, Exxon Mobil's climate research dates back to 1978. In the Exxon Research and Engineering Company's "Technological Forecast: CO_2 Greenhouse Effect," written in 1980, scientists Shaw and McCall predict from energy projection calculations a doubling of CO_2 in the atmosphere by around 2060, and conclude this would likely increase the global average temperature (McCall & Shaw, 1980). Despite this report being withheld until 2015 when other Exxon Mobil internal documents were leaked, which led to the eruption of the #ExxonKnew movement, in publishing such research now on its website, Exxon Mobil presents itself as transparent with the public about the issue of climate change, and as aware of the issue for many years.

Chevron highlights its more recent efforts on research, claiming that "since 2000, Chevron has invested more than $9 billion in research and development," of which climate change and the environment are topics of particular focus (Chevron, 2020c). By advertising this investment, Chevron reassures the public it takes climate change seriously. Shell Oil has been developing since the early 1970s its "Shell Scenarios," in which it outlines visions for the future (Shell, 2020c). One such scenario, called *Sky*, outlines a way to achieve the Paris Agreement goals "consistent with limiting the global average temperature rise to well below 2°C from pre-industrial levels" (Shell, 2020b). Shell Oil is stressing that it is thinking ahead about how climate action will shape the future for our world with these Shell Scenario visions. By publicizing

investments in climate research, fossil fuel companies are making a public plea that they are acting to mitigate climate change.

Lower Carbon Techniques

Fossil fuel companies have been seeking to develop lower carbon techniques. Shell Oil states that it is committed to working on carbon capture and storage (CCS) technology. In Australia, it is involved in the world's largest CCS project. Shell asserts the Gorgon CO_2 injection project will "separate and reinject between 3.4 million and 4 million tonnes of reservoir CO_2 each year" (Shell, 2018b). Shell Oil claims to be a leading world supplier of natural gas and one of the largest producers of sugar cane biofuels; in 2017 the company included about 9 billion liters of biofuel in the petrol and diesel it sold (Shell, 2018b; 2020a). As a leading company in such initiatives, Shell Oil presents itself as striving to reduce its carbon footprint. Chevron also engages in carbon capture, utilization, and storage (CCUS) projects, of which it has invested $1.1 billion, that "are expected to reduce GHG [greenhouse gas] emissions by about 5 million metric tons per year" (Chevron, 2019). Methane management has been a particular focus for Chevron, and it reports that since 2013 it has reduced its methane emissions by 47 percent (Chevron, 2020b). By publicizing such efforts, Chevron presents itself as environmentally responsible.

Exxon Mobil has made similar investments in carbon capture and storage and the development of advanced biofuels. It is seeking to develop biofuels from algae and cellulosic biomass that may emit 50 percent of the greenhouse gas emissions of conventional transportation fuels. Exxon Mobil claims that since 1970 it has "cumulatively captured more CO_2 than any other company - accounting for more than 40 percent of cumulative CO_2 captured" (Exxon Mobil, 2020b). It is promoting its investments in lower carbon techniques, thus indicating it

understands the climate threat. By publicizing such efforts, fossil fuel companies have been presenting themselves as alert to the dangers of CO_2 and methane emissions in contributing to climate change, and as responsible, corporate citizens.

Emission Goals

Fossil fuel companies have set emission goals for themselves to meet. In its 2018 Corporate Responsibility Report, Chevron states that its "Board of Directors established greenhouse gas emissions performance measures, targeting a 20 to 25 percent reduction in methane emissions intensity and a 25 to 30 percent reduction in flaring intensity by 2023." Furthermore, the compensation of executives and most of its employees will be tied to the success of these established goals (Chevron, 2018). By setting these five-year targets, Chevron appears to be serious about making changes to its company presently. In linking the compensation of its executives and employees to them, it is incentivizing the pursuit of these goals. Exxon Mobil states in its 2019 Energy and Carbon Summary that its greenhouse gas emissions performance target goals from 2018 include a 25 percent reduction in flaring and 15 percent reduction in methane emissions by 2020 in comparison to 2016 (Exxon Mobil, 2020b). Similar to Chevron, Exxon Mobil set its emission reduction goals for the near future, thus demonstrating that the company is attempting to make these goals attainable, and changing current company practices to achieve them.

Shell Oil intends to "cut the carbon intensity" of the energy it sells "by around 20% by 2035 and by around half by 2050." While this goal is long-term, the company has short-term milestones in place every three years to reduce its Net Carbon Footprint: in 2019 it set a 2-3 percent reduction goal in comparison to 2016. Shell Oil executives' pay has been tied to

achieving these milestones (Shell, 2020d). Shell Oil's approach is like Chevron's: executive compensation is linked to these goals in order to demonstrate the seriousness of these efforts; short-term intermediate goals promote long-term success. Such efforts help fossil fuel companies claim they understand climate change concerns and care about their impact.

Policy Efforts

Fossil fuel companies publicize their support of various policy efforts and climate groups. Exxon Mobil states that since the United Nations established the panel in 1988, its scientists have partaken in the United Nation's Intergovernmental Panel on Climate Change (Exxon Mobil, 2018). In the 2019 Energy and Carbon Summary Report, Exxon Mobil declares its support of the 2015 Paris Agreement, and in 2017 it "became a founding member of the Climate Leadership Council to help promote a revenue-neutral carbon tax" (Exxon Mobil, 2020b). Exxon Mobil presents itself as a company that has long cared about the climate change threat. Chevron claims it recognizes the "findings of the Intergovernmental Panel on Climate Change (IPCC) that the use of fossil fuels contributes to increases in global temperatures," and that is sees "the Paris Agreement as a step forward" (Chevron, 2020a). Chevron does not deny that it is contributing to the problem of climate change, rather it acknowledges this and complies with current policy efforts. In its Update to Climate Change Resilience, Chevron promotes its membership and $100 million investment in the Oil and Gas Climate Initiative (OGCI), an organization that aims to reduce greenhouse gas emissions through technology and business ventures (Chevron, 2019). Chevron presents itself as active in pursuing opportunities to reduce emissions.

Shell Oil claims it is helping to advance the United Nations sustainable development goals to "end poverty, protect the planet and ensure prosperity for all by 2030," and that it

"welcomes and supports the Paris Agreement" (Shell, 2018b). Shell Oil endorses global policy responses to climate change, showing that the company cares about its business's effects. It is a member of many climate organizations, including the Climate Leadership Council (of which it is a founding member), the Energy Transitions Commission (which it established in 2015 to develop low-carbon energy systems), and the Hydrogen Council (to promote hydrogen in the transition to lower-carbon energy (Shell, 2018b). By supporting these organizations, Shell Oil presents itself as aligned with the public demands regarding climate change action. The fossil fuel companies have endorsed current policy efforts, particularly the Paris Agreement, and work with climate groups developing lower-carbon energy methods. They are striving to demonstrate their support of climate action, given their substantial contributions to greenhouse gas emissions into the atmosphere.

Conclusion

Fossil fuel companies have responded to evidence and pressure, coming from shareholders and investors as well as the general public, to recognize and mitigate climate change. Since 2018 the responses have included efforts in four apparent categories: in-house research, lower carbon techniques, emission goals, and policy efforts. Fossil fuel companies appear to regard climate change as urgent and are presenting themselves as responsible corporate citizens. This recent stance is a departure from previous strategies, which were more evasive and merit further study. Fossil fuel companies' efforts have been responses to public and shareholder pressure; their actual commitment to effective action even at a high cost is less clear. The #ExxonKnew movement emerged only from the discovery of documents demonstrating that Exxon Mobil had known about the threat of climate change for four decades, after investigative

journalists revealed these documents to the public without the permission of Exxon Mobil. Ever since criticism emerged, the documents regarding climate change research have been made openly available by Exxon Mobil online. Shareholders and investors, such as the Vanguard Group and BlackRock Fund Advisors, have a direct financial interest in how fossil fuel companies react to climate change and have gone as far as demanding greater transparency regarding sustainability measures from the corporations they are invested in. Companies respond to sufficient pressure, coming from a variety of groups with either environmental or business motives in mind. Because pressure to face the pressing issue of climate change is still growing, fossil fuel companies' recent efforts may only be the beginning of what needs to be done to tackle this global problem.

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