



*The Moral Responsibility
of Integrated Oil and Gas
Companies: The Pernicious
Market Failures Approach*

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Summary

This thesis analyses what the moral responsibility of integrated oil and gas companies is to contribute to the mitigation of climate change. First, it is argued that integrated oil and gas companies have been behaving unethically by profiting from a pernicious market failure. This is the case because they have been profiting by emitting greenhouse gases, which have significantly contributed to the negative externality of dangerous climate change. Moreover, integrated oil and gas companies seem to have known this for longer than the general public and have influenced climate policies in order to keep profiting. The conclusion is reached that the moral responsibility of integrated oil and gas companies is to transform their business model to become less carbon-intensive, eventually phasing out the production and sale of fossil fuels completely. Moreover, they should disgorge profits made from the production and sale of fossil fuels and use the disgorged profits to help those who are most vulnerable to the harms of climate change. These responsibilities are based on the principle of corrective justice, which states that parties who engage in activities that are wrongfully harming others should desist from the activities causing harm and compensate those who have been injured by their activities.



1. Introduction

In December 2020 Milieudefensie, a Dutch climate organisation, started a lawsuit against Shell. Their claim is that Shell needs to stop causing dangerous climate change. Concretely, they want Shell to reduce its emissions by 45% in 2030 relative to its emissions in 2019. The argument of Mileudefensie is that everybody needs to contribute to climate change and Shell is not doing its part. On the contrary, it is the biggest polluter in the Netherlands and still spends billions of dollars on oil and gas extraction although it has been aware of the destructive consequences for the environment since the 1960s.¹ Specifically, the argument of Milieudefensie is based on five components: Shell has known about dangerous climate change and its contribution to the problem for a long time, Shell has made a substantial contribution to the problem of climate change, Shell has the ability to exercise control over its contribution to climate change, Shell clearly has a role to play in the transition to a more sustainable society, and lastly, it is not impossible for Shell to take effective measures. According to Milieudefensie, these components together show that Shell is causing unlawful danger.²

Shell has responded that although it agrees with Mileudefensie that the world needs to work towards the goals of the Paris Climate Agreement, it disagrees with Milieudefensie on how to achieve this goal. Shell feels that the claim of Mileudefensie is inappropriate. Shell points out the different roles that government, NGOs, and companies such as Shell play in reaching the goals of the Paris Climate Agreement: *“Governments create rules and frameworks that point people in the direction of lower-carbon energy, NGO’s raise awareness and make sure society keeps its goals in sight and companies like Shell provide options which allow people to choose cleaner energy.”* Shell has defended itself, claiming that it is actually progressive in providing clean energy options and has set the goal to have its net emissions at zero by 2050.³ Shell also points out that the Paris Agreement is an agreement between governments, and it is thus up

¹ Milieudefensie. “Help Ons de Rechtszaak van de Eeuw te Winnen.” Last modified March 29, 2021. <https://milieudefensie.nl/actie/klimaatzaakshell>

² “Verslag Klimaatzaak van Milieudefensie tegen Shell,” Milieudefensie, last modified December 1, 2020, <https://milieudefensie.nl/actueel/livestream-klimaatzaak-milieudefensie-tegen-shell>

³ “Hoe Shell Denkt Over de Klimaatzaak,” Shell, last modified May 20, 2021, <https://www.shell.nl/media/nieuwsberichten/2020/hoe-denkt-shell-over-de-klimaatzaak.html>



to governments to establish the appropriate policy to reach the agreement, not to one private company.⁴

Milieudefensie and Shell paint a very different picture of the responsibility of Shell to contribute to the mitigation of climate change. Milieudefensie seems to appeal to the harm that Shell is causing as a basis for a responsibility to take immediate action to mitigate climate change. On the other hand, Shell bases its responsibility on the rules and frameworks created by the government. There is a clear difference in the way the two parties view corporate responsibility with regard to climate change.

In May 2021, the court ruled that Shell needs to reduce its emissions, in line with the claim of Milieudefensie. The court based its verdict on the protection of human rights, which will be violated if dangerous climate change occurs, claiming that companies such as Shell have an independent obligation to do their part to counteract climate change. Moreover, Shell should not base its decisions about becoming greener on how fast the rest of society becomes greener. “In line with society is not enough” is the verdict of the judge. The judge did make a distinction between the emissions of Shell itself and the emissions of Shell’s suppliers and customers. Shell is legally required to reduce its own emissions by 45%, whereas for the emissions of customers and suppliers it is required to show that it is making an effort to reduce emissions.⁵

Although both parties seem to agree that companies such as Shell have some role to play in mitigating climate change, the question arises what that role is exactly. There are many different arguments to make for what moral responsibility companies such as Shell have concerning climate change. As is illustrated by the different arguments employed in the case of Milieudefensie against Shell, many different factors play a role in determining what the responsibility of such companies is, such as their contribution to climate change, human rights, but also the role of governments and individuals, economic interests, etc. Therefore,

⁴ Milieudefensie, “Verslag Klimaatzaak van Milieudefensie tegen Shell”

⁵ De Weijer and Hotse Smit, “Historische Uitspraak in Klimaatzaak: Shell Moet CO₂ Uitstoot Drastisch Verminderen,” de Volkskrant, May 26, 2021, <https://www.volkskrant.nl/nieuws-achtergrond/historische-uitspraak-in-klimaatzaak-shell-moet-co2-uitstoot-drastisch-verminderen~b27cd4be/>



the research question of this thesis is: *What moral responsibility do integrated oil and gas companies have to contribute to the mitigation of climate change?*

The focus of this thesis is on integrated oil and gas companies. Integrated oil and gas companies engage in the exploration, production, as well as refinement and distribution of oil and gas.⁶ Examples of integrated oil and gas companies are companies such as Shell, BP, and ExxonMobil. Integrated oil and gas companies are known to have made a big contribution to greenhouse gas emissions.⁷ On the other hand, much of society has become dependent on these companies. Therefore, the question of what such companies should do in the face of dangerous climate change becomes quite complicated.

I will argue that integrated oil and gas companies have a moral responsibility to mitigate climate change by transforming their business model to become as carbon neutral as possible, eventually phasing out the production and sale of fossil fuels completely. Moreover, they need to compensate for harms already caused by their emissions by disgorging profits made from the production and sale of fossil fuels and using these to compensate those who are most vulnerable to the negative impacts of climate change. They have these responsibilities because they have been behaving unethically by exploiting a market failure and need to correct their behaviour. First, I will argue that the fossil fuel industry is, and has been, behaving unethically. I will base my argument on the normative approach of Norman's Business Ethics as Self-Regulation. I will start by explaining Norman's approach, how it relates to Heath's Market Failures Approach, and how it will form the normative basis for this thesis. The main point of this chapter is that the concepts and tools used for the justification of regulation in the market can also be used to make a normative argument about the responsibilities of companies. One of these concepts is market failure, which can justify government intervention in the market but also beyond-compliance responsibilities of companies. In particular, companies are behaving unethically when they profit from pernicious market failures. Next, I will discuss what climate change is, what market failures are, and how climate change can be seen as a market failure. I will then discuss the harms

⁶ James Chen, "Integrated Oil and Gas Company," Investopedia, last modified May 27, 2021, <https://www.investopedia.com/terms/i/integrated-oil-gas-company.asp>

⁷ Paul Griffin, "The Carbon Majors Database: CDP Carbon Majors Report 2017, CDP



that climate change causes, showing that climate change is indeed a ‘pernicious’ market failure. Then, I will discuss the way that integrated oil and gas companies profit from climate change. Based on these three things: climate change is a market failure, climate change is pernicious, and fossil fuel companies profit from climate change, I conclude that they are, and have been, behaving unethically. Once it has been established that the fossil fuel industry is indeed behaving unethically, the next question is how they should correct their behaviour. I will argue that it is unrealistic to ask integrated oil and gas companies to stop emitting greenhouse gases immediately, but they should contribute to mitigation by transforming their business model to become as carbon neutral as possible, eventually phasing out the production and sale of fossil fuels, as well as compensating for harms already caused by disgorging their profits. This is argued based on the principle of corrective justice which states that if a party engages in activities that are wrongfully harming another party, the party causing harm should desist from the activities causing harm and compensate those who have experienced injuries. The research is done in the form of a literature review. It consists of an analysis of normative concepts using insights from both economics and climate science.



2. The Normative Basis

In order to analyse what the moral responsibilities of fossil fuel companies are in the face of climate change, a normative framework is needed. In this chapter, I discuss Norman's normative framework of business as self-regulation and the advantages it has over theories such as stakeholder theory and corporate social responsibility. I then discuss Heath's market failures approach and how it fits within Norman's framework. Lastly, I discuss the amendments that Norman makes to Heath's approach and form the basic argument that will be the basis of the analysis of the moral responsibilities of fossil fuel companies.

Norman's Business Ethics as Self-Regulation

In defence of itself, Shell has pointed to the role that different institutions play in reaching the goals of the Paris Climate Agreement. By creating the rules and frameworks for lower use of carbon energy, the government has the biggest role, according to Shell. Shell claims that *"governments must set targets and proper energy transition policy as they deem appropriate for their countries (which will drive change in consumer and industry behaviour) as opposed to private parties seeking to use court proceedings to extend the law by beyond its prescribed limits."*⁸ Essentially, it seems that Shell defends itself by arguing that they are operating within the law and thus are not doing anything wrong. Of course, considering that this statement is made in light of a legal case, this is a reasonable approach. Ethically speaking, however, that something is legal does not have to mean that it is right.

The question thus arises whether businesses have responsibilities to go beyond compliance with the law, and if so, what these responsibilities would look like in practice. This kind of question is what theories of business ethics are largely concerned with. What justifies obligations that go beyond what is required by law?⁹ Curiously, the methods and concepts that are used to justify laws and regulations of the market are rarely used to justify ethical obligations that go beyond compliance with the law. Norman calls this a *normative asymmetry*. He advocates for the use of similar concepts and methods that are used to justify

⁸ Shell, "Hoe Shell Denkt Over de Klimaatzaak"

⁹ Wayne Norman, "Business Ethics as Self-Regulation: Why Principles that Ground Regulations Should Be Used to Ground Beyond-Compliance Norms as Well" *Journal of Business Ethics* 102 no.1 (January 2012): 1



laws and regulations for the market to also justify certain beyond-compliance obligations of businesses.¹⁰

Put very shortly, Norman argues that if there is a clearly identifiable reason why a certain behaviour should be illegal, then a business should not profit from such behaviour, even if it is not (yet) illegal. The intuition behind this reasoning is that there are many cases in business where there is a good reason to establish regulation, but because of practical or political reasons these regulations are not enforced, or at least not to a level that is strict enough. In some of these cases, the justification for such regulation can also provide a compelling normative argument for a company, or even an entire sector, to act in a way that would be required by such regulation.¹¹

Norman's approach has an advantage over more widely used frameworks in business ethics, such as stakeholder theory and corporate social responsibility (CSR). Norman points out that stakeholder theory and theories of CSR and corporate citizenship do not offer a way of justifying which beyond-law obligations businesses have exactly and how the claims of stakeholders with conflicting interests should be balanced by the relevant business actors. The most important thing that seems to be lacking from these theories is a principled way of determining when businesses should forego profitable opportunities that are legal, but nevertheless possibly unethical or irresponsible.¹² This is exactly what is required to argue what businesses should do to contribute to climate change mitigation. Think again of the case of Shell and Milieudéfense. Even Shell itself acknowledged that businesses have some responsibility by means of facilitating green energy. Milieudéfense, however, clearly feels this is not enough. This shows that the question is not whether Shell has *any* responsibility to contribute to the mitigation of climate change, but what that responsibility should look like in practice.

To illustrate the advantage of Norman's approach: stakeholder theory argues that managers have a fiduciary duty to advance the interests of all stakeholders, not merely the

¹⁰ Norman, "Business Ethics as Self-Regulation," 3.

¹¹ Norman, "Business Ethics as Self-Regulation," 6.

¹² Norman, "Business Ethics as Self-Regulation," 5.



shareholders. Commonly mentioned stakeholders are consumers, suppliers, employees but also the community in which the business operates.¹³ The problem is that beyond identifying the stakeholders and their interests, the theory offers no particular methodology for balancing the interests of different stakeholders. This, then, becomes the responsibility of the manager. But there is no reason why the manager is the best equipped person to make such judgments.¹⁴ Similarly, concepts such as responsibility and citizenship do not clarify how far beyond the law a manager or firm is supposed to go. Managers and firms have many different responsibilities towards different constituents or stakeholders, some of which conflict. Again, there is no prescribed method to balance these.¹⁵ Using concepts and methods similar to those that are used for justifying regulation to justify beyond-compliance obligations does not run into this problem because these concepts and methods are meant to result in practical policy recommendations.

An added advantage is that the approach is realistic in a sense. Managers and firms are familiar with complying with various government regulations and know the concepts and mechanisms that are used to justify these regulations. Since firms know how to comply with regulations, they can use that knowledge and apply it to beyond-compliance responsibilities.¹⁶

Heath's Market Failure Approach

So far, I have discussed a normative approach to *how* beyond-compliance obligations of businesses may be justified (one that is, in my opinion, convincing). Namely, by using the tools for justifying regulation in the market. However, I have said nothing yet about what these tools are that could justify beyond-compliance obligations. An approach that is consistent with Norman's theory is Heath's Market Failures Approach. Heath uses the concept of the invisible hand, which is at the root of neoclassical economics, to show that market failure can demand ethical restraint from businesses. His argument is described below.

¹³ R. Edward Freeman, Jeffrey S. Harrison, and Stelios Zyglidopoulos, *Stakeholder Theory*, (Cambridge: Cambridge University Press, 2018): 16

¹⁴ Norman "Business Ethics as Self-Regulation"; Joseph Heath, "Business Ethics Without Stakeholders," *Business Ethics Quarterly* 16 no.3 (2006): 546

¹⁵ Norman, "Business Ethics as Self-Regulation," 4.

¹⁶ Norman, "Business Ethics as Self-Regulation," 7-8.



In neoclassical economics, firms are described as profit-maximizing agents. The idea behind letting firms compete against each other in their self-interest is that it will ultimately benefit society. In the words of Adam Smith “*By pursuing his own interest, he frequently promotes that of the society more effectually than when he really intends to promote it.*”¹⁷ Under certain circumstances, there will be *perfect competition* between firms. Perfect competition will lead to an equilibrium where the price of a product equals its marginal cost, that is, the costs of producing one extra unit of the product. At this point, the outcome is efficient in the sense that it is not possible for anyone to be better off without someone else being worse off, this is called Pareto efficiency. In the long run, this ensures that buyers will pay exactly the cost of producing whatever product it is they are buying. Moreover, there will be no less costly way for firms to produce the product. There will also be a ‘normal rate of profit’, namely the opportunity cost of the resources invested in the firm. Besides these ‘efficient’ outcomes, free-market competition also allows for a huge volume of activities without any central coordination and only products that customers actually want will be produced in the long run.¹⁸ Furthermore, to improve their position in the competition, firms are incentivized to improve the quality of their product, be innovative, etc. Heath calls the strategies that lead to these kinds of beneficial effects for society *preferred strategies*.¹⁹

There are four conditions for perfect competition, i.e., market competitions that lead to the benefits described above:

1. Firms sell a standardized product: one product is a perfect substitute for another;
2. Firms are price takers: the individual firm treats the market price of a product as given;
3. Firms have free entry and exit, with perfectly mobile factors of production in the long run;
4. Firms and consumers have perfect information.²⁰

Under these conditions, firms can only make use of preferred strategies. But obviously, these conditions do not always hold in the real world. Thus, firms can also make use of what Heath

¹⁷ Adam Smith (1776) in Robert H. Frank, *Microeconomics and Behavior* (New York: McGraw-Hill Education, 2015), 337.

¹⁸ Robert H. Frank, *Microeconomics and Behavior* (New York: McGraw-Hill Education, 2015), 336-338

¹⁹ Heath, “Business Ethics Without Stakeholders,” 549.

²⁰ Frank, *Microeconomics and Behavior*, 321-322.



calls *non-preferred strategies*, which are not beneficial to society. For instance, by producing pollution or selling products with hidden quality defects. This leads to a situation where the market fails to produce a Pareto efficient outcome, which is called market failure.²¹ In such a situation, profit-seeking competition in the market is not beneficial for society in the sense that it creates a Pareto efficient outcome.

Heath argues that it is immoral for firms to exploit market failures in order to make a profit. This is the case because profit-seeking competition is justified by the benefits that it produces for society. When a firm exploits the fact that the conditions of perfect competition do not always hold, it undermines these social benefits that justify why firms should seek profit to begin with.²²

Market failure is generally considered as a good reason for governments to intervene in the market in order to bring the real market closer to the ideal of perfect competition. However, as is described by both Norman and Heath, the law may fall short of what is needed to produce the best outcome. For example, the state often does not have the right information required to make an improvement or record-keeping and compliance monitoring can become too costly for an intervention to be truly efficient. In such situations, businesses will need to ethically constrain themselves. According to Heath, it is when strategies are legal, yet not among the so-called preferred strategies, that ethical restraint becomes relevant.²³

An advantage of this approach is that it recognizes that firms operate within a competitive environment. Within a competitive environment, ethical norms differ from those in everyday life. Heath compares competition in the market to sports: within a sports competition, we may allow for things that we find unethical in daily life. Nevertheless, there are rules and we have an idea of what good sportsmanship is. The market failures approach thus acknowledges the competitive nature of firms yet does not excuse firms from ethical restraint.²⁴

²¹ Heath, "Business Ethics Without Stakeholders," 549-550.

²² Heath, "Business Ethics Without Stakeholders," 551.

²³ Heath, "Business Ethics Without Stakeholders," 550.

²⁴ Heath, "Business Ethics Without Stakeholders," 552.



The Pernicious Market Failures Approach

In line with Norman's approach, the justification for beyond-compliance obligations in the market failures approach is derived in the same way as justification for regulation of the market would be. Norman sees his business ethics as self-regulation approach as a "friendly amendment" to Heath's market failures approach. He argues that although Heath's approach fits neatly with both why our market is the way it is and why market regulations are sometimes in order, it is unrealistic to argue that it is always unethical to profit from market failure. After all, the conditions that are required for perfect competition rarely hold. In reality, then, almost all major firms make at least some profit by exploiting market failures. If Heath's theory holds, then that would imply that all of these firms are acting immorally. This is what seems unrealistic. For instance, sometimes market failures are deliberately introduced by governments to counteract other market failures. Moreover, not all market failures seem to be intrinsically harmful.²⁵ Monopolies, for example, are considered to be a reason for market failure. However, there are also *natural monopolies*. Natural monopolies occur when it is more practical to have only one producer in a certain market. An example is utilities servicing sewage. Multiple sewage systems within a city where one sewage system would suffice would simply be impractical.²⁶ And even if it would always be immoral to exploit market failure, there may still be other reasons irrespective of market failure why we think regulation in the market is needed.²⁷ For instance, the initial distribution of resources among members of a society will determine what the eventual efficient outcome of the market will look like.²⁸ But think of a society of only two people. Both the situations where one person has 50\$ and the other has 50\$ and the situation where one person has 99\$ and one person has 1\$ are Pareto efficient in the sense that one cannot be made better off without making the other one worse off. A Pareto efficient outcome is thus not necessarily fair. One might want to justify regulation of the market because of considerations of distributive justice.

Nevertheless, Norman argues a compelling normative argument can be made in the face of "pernicious market failures." Pernicious market failures are market failures that cause harm

²⁵ Norman, "Business Ethics as Self-Regulation" 11.

²⁶ Graham Squires, *Urban and Environmental Economics: An Introduction*, (London: Routledge, 2012), 107.

²⁷ Norman, "Business Ethics as Self-Regulation" 11.

²⁸ Frank, *Microeconomics and Behavior*, 338.



or are clearly irresponsible.²⁹ Norman does not elaborate on this, but I think the intuition behind this might be something like the following. Heath argues that it is unethical for firms to profit from market failures because this undermines the benefits that justify profit-seeking competition between firms. However, although market failures undermine the benefits described by economic theory, i.e., a Pareto efficient allocation of goods and services, this does not mean they are necessarily harmful. Think again of natural monopolies. However, if a market failure is ‘pernicious’ then it is clearly not beneficial to society. Thus, it would be unethical for firms to profit from such market failures. This might be called the pernicious market failures approach.

The pernicious market failures approach will form the basis of the argument of this thesis. Based on the pernicious market failures approach, a few things would have to be shown to argue for a moral responsibility of integrated oil and gas companies to mitigate climate change. The argument might look something like this:

P1: Exploiting pernicious market failures is unethical

P2: Climate change is a market failure

P3: Climate change is pernicious

P4: Integrated oil and gas companies exploit climate change

C: Integrated oil and gas companies are behaving unethically

The pernicious market failures approach, however, does not show yet that integrated oil and gas companies have a moral responsibility to contribute to climate change nor what that responsibility looks like. However, when one is or has been behaving unethically, it is usually argued that one has a moral responsibility to stop acting unethically and sometimes also to correct for unethical behaviour. Showing that integrated gas and oil companies are behaving unethically is thus an important step in determining their moral responsibility.

²⁹ Norman, “Business Ethics as Self-Regulation” 11.



3. Climate Change and Market Failure

In order to show that the pernicious market failures approach applies to fossil fuel companies,³⁰ the first step is to show that climate change is indeed a market failure. To this end, I first discuss what climate change is and how it occurs. Next, I discuss what market failures are, particularly externalities, public goods, and common resources. Finally, I explain that climate change is a negative externality and can be conceptualised both in terms of a public good and a common resource.

What is Climate Change and How Does It Occur?

The last three decades have been warmer at the Earth's surface than any other decade has been since 1850. The upper ocean has warmed in the period between 1971 and 2010 and has also likely warmed in the period between 1870 and 1971. Precipitation in the Northern hemisphere has increased since 1901 and the ocean increased in acidity by 26% since the beginning of the industrial era. Moreover, snow and ice have been decreasing in the last decades and sea levels have been rising.³¹ In short, the climate has been changing at seemingly unprecedented rates.

The observed warming of the earth and all of its effects have mostly been attributed to the increase of anthropogenic greenhouse gas emissions. Economic growth and population growth have led to extremely high levels of greenhouse gas emissions. Greenhouse gases that have been emitted at high levels are carbon dioxide (CO₂), methane (CO₄), and nitrous oxide (N₂O). The concentration of these gases in the atmosphere is now higher than it has been in at least the last 800,000 years.³² Greenhouse gases, particularly CO₂, are emitted through the burning of fossil fuels, but deforestation, land use, and burning biomass are all big contributors to anthropogenic carbon emissions as well.³³

³⁰ From this point on, I will refer to integrated oil and gas companies as fossil fuel companies.

³¹ IPCC, "Climate Change 2014: Synthesis Report," (2014): 2-4.

³² IPCC, "Climate Change 2014: Synthesis Report," 4.

³³ Felix R. FitzRoy and Elissaios Papyrakis, *An Introduction to Climate Change Economics and Policy*, (London: Routledge, 2016), 16.



Anthropogenic greenhouse gas emissions contribute to the so-called enhanced greenhouse effect. The earth's surface is warmed by solar radiation. When solar radiation reaches the earth's atmosphere part of its energy is absorbed by the land and oceans, which warms the earth. The rest of the energy is reflected back towards space. Some of the heat that is reflected is trapped in the atmosphere by greenhouse gases, similar to the way that heat stays trapped in greenhouses. This also warms the atmosphere and the earth's surface. This process is called the greenhouse effect. Without any greenhouse gases in the atmosphere, the earth would be much colder. The greenhouse effect is necessary to sustain life on earth. Anthropogenic emissions, however, lead to an increase in greenhouse gases in the atmosphere. Because of this, more heat stays trapped in the atmosphere and the earth's temperature rises. This is called the enhanced greenhouse effect.³⁴

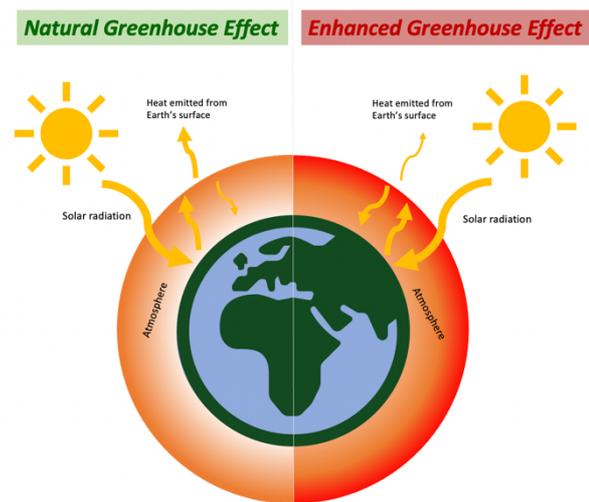


Figure 1: The Enhanced Greenhouse Effect (Source: Rogelio Majer Mosino, "The Greenhouse Effect," Sustainable Energy Network Solutions, accessed June 18, 2021, <https://sustainableenergy.com/the-greenhouse-effect.html>)

A temperature rise has a lot more impacts than just a slightly warmer climate. The climate system is sensitive to even small changes, as these can cause all kinds of positive feedbacks.³⁵ A rise in temperature can cause ice to melt, sea levels to rise, as well as increase the occurrence and severity of extreme weather events such as storms, heatwaves, floods, and droughts.³⁶ Many kinds of positive feedbacks amplify the influence of anthropogenic greenhouse gases. For instance, oceans will continue to warm for many years, even if there are no more greenhouse gas emissions from now on. This leads to more reduction in snow and ice, which reduces the capacity to reflect solar energy as well as enhances warming. This goes on until there is a new equilibrium with less ice and higher sea levels. Another positive

³⁴ Australian Government, Department of Agriculture, Water and the Environment, "Greenhouse Effect," accessed May 31, 2021, <https://www.environment.gov.au/climate-change/climate-science-data/climate-science/greenhouse-effect>.

³⁵ FitzRoy and Papyrakis, *An Introduction to Climate Change Economics and Policy*, 13.

³⁶ FitzRoy and Papyrakis, *An Introduction to Climate Change Economics and Policy*, 20.



feedback is called the carbon feedback. Due to warming, frozen Arctic regions thaw. When the ground thaws, organic matter decomposes, releasing additional CO₂ and CO₄.³⁷ Positive feedbacks thus amplify the effects of anthropogenic greenhouse gas emissions, which will, in turn, amplify the effects of climate change. The impacts of climate change, particularly those that are expected to cause harm, will be discussed in the next chapter.

What Is Market Failure?

Market failure can potentially provide a compelling justification both for regulation of the market by the government as well as for self-regulation. To understand why, it is important to have a good understanding of what exactly market failure is and how it occurs. Moreover, a good understanding is required for understanding in what way climate change can be considered a market failure, which will be discussed in the following section.

As was described in the previous section, a market failure is a situation in which the market fails to produce an efficient allocation of resources. But what does this mean in practice? Usually, five reasons are named for why markets fail:

1. Monopolies: there is only one supplier of a good or service.
2. Externalities: there are spill-over effects that lead to costs or benefits for third parties who are not part of the market transaction.
3. Public goods and common resources: goods that one cannot provide others from using and that one can use without excluding someone else from using it.
4. Weak property rights: institutions have not been able to establish well-defined property rights.
5. Asymmetric information: consumers and producers do not have the same information, which they base their decisions on.³⁸

Externalities, Public Goods, and Common Resources

For the purpose of analysing climate change, I will focus on externalities, public goods, and common resources. Externalities are positive or negative spill-over effects on third parties

³⁷ FitzRoy and Papyrakis, *An Introduction to Climate Change Economics and Policy*, 17.

³⁸ Squires, *Urban and Environmental Economics*, 109.



that arise from the production or consumption of goods and services. A third party is someone who is not part of the market exchange for a good or service, thus someone who does not consume nor produce the good or service in question. In the case of a positive externality, a third-party experiences benefits as a result of a market transaction. In the case of a negative externality, a third-party experiences costs as a result of a market transaction. Externalities occur because the external costs of a private transaction are not considered and are ultimately not integrated into the full economic cost.³⁹ An example of an externality is the pollution of a river by dumping chemicals. This imposes a cost on the community surrounding the river but this cost is not integrated into the economic cost. Externalities are unlikely to result in an efficient allocation of resources.⁴⁰

To have an understanding of what public goods and common resources are, two terms are helpful: excludability and rivalry. Excludability refers to whether people can be prevented from using the good. Rivalry refers to whether one person's use of a good reduces the ability of another person to use it.⁴¹ To get a feel for these terms consider a slice of pizza: I can exclude someone from eating a slice of pizza, simply by not selling it, a slice of pizza is thus excludable. Furthermore, if I eat a slice of pizza, then another person cannot eat that slice of pizza, a slice of pizza is thus rival. Now, on the other hand, consider a public beach. I cannot prevent anyone from going to the beach, it is non-excludable. When I enjoy a sunny day on the beach, this does not decrease anyone else's ability to also enjoy a sunny day on the beach, it is thus non-rival as well.

Public goods are goods that are non-excludable as well as non-rival. The public beach mentioned above is a public good, for example. When public goods are provided by the market, the problem of free-riding occurs. A free-rider is someone who makes use of a good without paying for it. People have an incentive to be free riders because it allows them to enjoy the benefits of a good without any costs. It is irrational for the market to provide a public good because it will not be profitable since many people will likely not pay for it. This

³⁹ Squires, *Urban and Environmental Economics*, 105.

⁴⁰ Brian Andrew, "Market Failure, Government Failure and Externalities in Climate Change Mitigation: The Case for a Carbon Tax," *Public Administration and Development* 28 (2008): 398

⁴¹ Gregory N. Mankiw, *Essentials of Economics*, (Boston: Cengage Learning, 2020): 216.



leads to an inefficient outcome since the good will not be provided at all. The market failure is the result of a positive externality. People who are not part of the market transaction still receive the benefits from the good. Thus, there are external benefits. The usual solution is that instead of the market, the government provides the good. The good is then paid for by the consumers through taxes.⁴²

Common resources are goods that are non-excludable, but rival. A commonly used example of common resources is fish. Given the size of the ocean, it is impossible to exclude people from going on a boat to go fishing. However, if one person catches a fish, then others can no longer catch that fish and the total pool out of which others can fish decreases. When there are only a few people fishing, this is not really a problem. But when there is excessive fishing, species can become extinct and no one will have access to fish anymore, which is clearly not an efficient allocation of fish. The problem occurs because private interests differ from social ones. Everybody has an incentive to keep fishing because they are only a small part of the problem. If one person stops fishing, then there will likely still be excessive fishing. That person then pays the cost of no longer being able to fish, while there are seemingly no benefits. To avoid overfishing, collective action is required. This kind of problem is often referred to as 'the tragedy of the commons.' Again, the problem arises because of an externality. Catching fish has a negative effect on others trying to catch fish. When this negative externality is neglected, there will be an excessive amount of fishing. The government can intervene by using regulation, taxes, or in some cases turn the common resource into a private good.⁴³

Public goods and common resources have value but do not have a price attached to them. Because of this, externalities arise. When private decisions about the consumption of these goods neglect the external effects, this can lead to an inefficient allocation of resources. (Self)-regulation of the market can then possibly raise economic wellbeing.⁴⁴

⁴² Mankiw, *Essentials of Economics*, 218.

⁴³ Mankiw, *Essentials of Economics*, 223-225.

⁴⁴ Mankiw, *Essentials of Economics*, 217.



Is Climate Change a Market Failure?

Climate change is a negative externality. The production of fossil fuels, as well as other industrial activities, leads to an external cost for third parties in the form of climate change and all of its consequences. These costs are not accounted for in the market.

Climate change can be characterized as a 'public bad.' Public bads can occur when no market provides the protection of a good. The reason that no market provides protection of the climate is that climate protection would be considered a public good. Climate protection is non-excludable and non-rival. People thus have an incentive to free-ride: to enjoy climate protection without paying for its costs.⁴⁵ The free-rider problem is made even more difficult because the costs of climate change (as well as the benefits of climate protection) take a lot of time to even be noticeable. This leads to what Nordhaus calls 'generational free-riding.' The current generation pushes the costs of protecting the climate onto future generations. As explained above, public goods are usually provided for by governments. However, because climate protection requires international cooperation, governments deal with the same problem as the market: there is an incentive for countries to free ride.⁴⁶ In the absence of effective international cooperation, we may have to look at companies to regulate themselves.

One could also view the climate as a tragedy of the commons. In this case, the atmosphere is a natural common. The atmosphere has a limited capacity to absorb greenhouse gases before global warming starts to occur. By emitting greenhouse gases, people or companies take a 'share' of the atmosphere.⁴⁷ Excessive emissions will exceed this capacity of the atmosphere. One person's emissions thus diminish someone else's ability to emit greenhouse gases without risking climate change. Nevertheless, there is an incentive to keep emitting in the same way that the fishers in the example above have an incentive to keep fishing.

⁴⁵ Jason Shogren, "Climate Protection: What Insights Can Economics Offer?" in *The Economics of Climate Change*, ed. Anthony D. Own and Nick Hanley, (Londen: Routledge, 2004), 57-58.

⁴⁶ William Nordhaus, "Climate Change: The Ultimate Challenge for Economics," *American Economic Review* 109 no.6 (2019): 2007.

⁴⁷ Marino Traxler, "Fair Chore Division for Climate Change," *Social Theory and Practice* 28 no. 1 (January 2002): 120.



Whether one wants to frame the problem of climate change as a public good or a common resource problem, one thing is clear: climate change is a negative externality produced by the market and results in an inefficient allocation of resources. After all, dangerous climate change eventually leads to costs for everyone. Climate change can thus be seen as a market failure. Nicholas Stern, from the Stern review, has even called it the greatest market failure that the world has seen, pointing out that those who emit greenhouse gases generally are not the ones to pay for climate change.⁴⁸ Going back to Norman's argument, it is unethical for firms to make a profit through exploiting a pernicious market failure. The next chapter will thus explore the potential impacts of climate change. From this, it will become clear that climate change is not only a market failure but is pernicious as well.

⁴⁸ Alison Benjamin, "Stern: Climate Change a 'Market Failure,'" The Guardian, last modified November 29, 2007, <https://www.theguardian.com/environment/2007/nov/29/climatechange.carbonemissions>.



4. The Harms of Climate Change

As discussed in Chapter 2, Norman points out that Heath's market failures approach is somewhat unrealistic. Profiting from market failure cannot necessarily be unethical, as some market failures are not harmful, and some are even necessary to counteract other market failures. However, 'pernicious' market failures *are* harmful. So, profiting from pernicious market failure is unethical. In the previous chapter, it became clear that climate change can be conceptualized as a market failure. The following question, then, is: is climate change pernicious? In this chapter, I will outline the different ways that climate change can be harmful.

The source that I use to discuss the harms of climate change is the fifth assessment report (AR5) of the Intergovernmental Panel on Climate Change (IPCC). The IPCC is a body of the United Nations that assesses climate change science and is generally seen as an authority on the topic of climate change. The IPCC thoroughly assesses scientific papers about climate change in order to provide a summary of what is known about climate change and its drivers, impacts, risks, as well as how adaptation and mitigation can reduce the risks of climate change. The IPCC also assesses how likely the science is to be correct. The IPCC publishes a comprehensive synthesis report every 6 to 7 years.⁴⁹

It is important to note that it is difficult to estimate the effects of climate change, as the climate interacts in complex ways with many different systems. Nevertheless, research shows that climate change may have many adverse effects, some of which are more certain than others. Many impacts also differ depending on how fast and to what extent the climate will change.

Ecosystems

As a result of climate change, ecosystems will change. The IPCC defines ecosystem changes as changes in the number and types of organisms present in the ecosystem, the physical appearance of the ecosystem, or the functioning of the ecosystem. Changes in ecosystems

⁴⁹ "About the IPCC," IPCC, accessed June 15, 2021, <https://www.ipcc.ch/about/>.



will put the well-being of both humans and many other species at risk. This is because ecosystems provide many services for all life on earth, such as food, the conditions for life, drinkable waters, and raw material for basic human needs. Ecosystems can limit the spread of diseases and influence the climate even further as well.⁵⁰ Some important impacts on different ecosystems that can occur as a result of climate change will be discussed below.

Terrestrial and Freshwater Systems

It is expected that climate change will negatively affect both terrestrial and freshwater systems. In general, it is predicted that both floods and droughts will appear more often and in higher magnitude. But this will be different for different regions. Droughts may occur in the form of less rainfall or drier soil and are projected to become longer as well as occur more often, as a result of reduced rainfall, increased evaporation, or both. Under scenarios where there is little mitigation, abrupt and irreversible ecosystem changes can occur regionally within this century. When changes occur that are beyond the natural variability of an ecosystem, this will alter the structure, composition, and functioning of these systems. One impact of climate change is an increased risk of extinction for many terrestrial as well as freshwater species. Some species may, for instance, not be able to move fast enough to a more suitable climate. For some species that are confined to small and isolated living areas, such as those who live on mountain-tops, climate change will have adverse effects even if they are fast enough to track suitable climates. Moreover, climate change interacts with other pressures. Because species are unique and irreplaceable, ecosystems are affected when they go extinct. The functioning of an ecosystem can be damaged even when species go extinct locally. Risks of extinction depend on the rate and amount of climate change. Tree death can also be attributed to climate change, which is an environmental risk because it may impact the climate, biodiversity, as well as food production, water quality, and economic activity. In freshwaters, the distribution of species will shift because of rising water temperature and water quality may be diminished.⁵¹

⁵⁰ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change," 319.

⁵¹ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 232; 274-277; 295; 319.



Coastal Systems

Coastal and low-lying areas can experience adverse effects because of sea level rising, ocean temperature rising, and ocean acidification. A rising sea level can cause the drowning of plants and animals, as well as changes in the light that is available, salinity, and the temperature of the sea. Moreover, rising sea levels can cause coastal erosion which leads shorelines to recede inwards. Warming temperatures can affect those species that are adjusted to specific temperature ranges. This especially poses a risk for species that already live at the upper end of their temperature range. Acidification of the ocean is a result of the extra CO₂ it absorbs. The impacts of acidification will be further discussed when the ecosystems of the ocean are discussed. High storm surges and higher waves also increase the probability that coastal sand barriers will be over-washed and breached. Not only coastal areas, but river deltas also risk erosion as precipitation patterns change.⁵²

Oceans

The ecosystem services provided by the ocean are important for human societies, as they provide food and other natural resources, regulate the climate (for instance by producing oxygen and removing CO₂ from the atmosphere), and offer protection from extreme weather events. Besides that, oceans also provide aesthetic and cultural services.⁵³

Oceans absorb 93% of the heat from the atmosphere. A rise of the temperature of the ocean can lead to a shift in the geographical distribution of marine species. The ocean exists of different layers, which differ in temperature, salinity, and denseness. The warming of the ocean as well as the addition of freshwater from ice melt and higher rainfall causes nutrient-rich layers to mix less with nutrient-limited layers, creating zones with oxygen-poor waters. Large, more active fish require more oxygen than what will be present in these

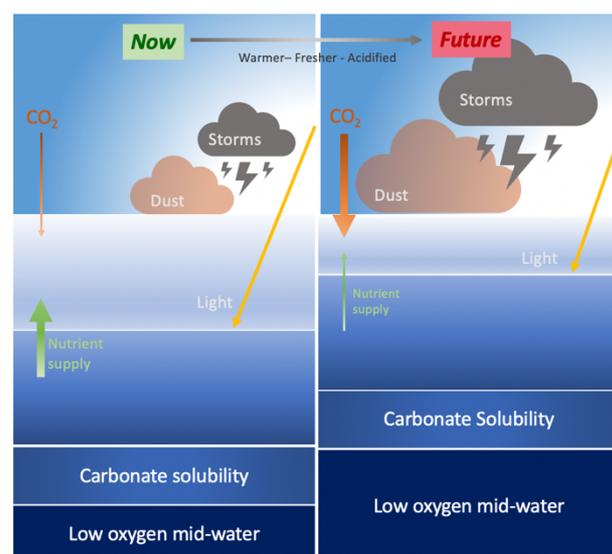


Figure 2: Projected Changes in the Ocean Due to a Changing Climate in the Coming Decades (Source: IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 420.)

⁵² IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 364-365; 374; 376.

⁵³ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 414.



waters and will need to move. Organisms with a lower need for oxygen will stay in these waters, and even thrive as their predators move away. These shifts in distribution will be irreversible. When species distribution shifts along with their seasonal timing of activities, this will have implications for species composition and ecosystem goods and services. Even organisms that are less likely to shift may be impacted because of changes in the food web that sustains them. It is expected that the richness of species will increase at mid and high latitudes, whereas it will decrease in tropical latitudes. This will affect how catch-potential is distributed globally which may impact food security.⁵⁴

Another impact on the ocean will be acidification. The ocean absorbs about 25% of the CO₂ emitted by burning fossil fuels. Chemical reactions turn some of this into carbon acid, acidifying the water. Some species depend on calcium carbonate to calcify their exoskeletons. For these species, ocean acidification might make it more difficult to build their shells and skeletons, because calcification will require more energy in more acid waters. The more energy these species need for calcification, the less energy they will have for other biological processes. Moreover, acidification is expected to affect many more organisms. In general, the extra CO₂ in the water is expected to affect water species in more dramatic ways compared to animals that live on land because animals who live in water have much less CO₂ in their blood.⁵⁵

Human Food Security, Health, and Security

Food Security

Climate change will affect humans in terms of food security, health, and security. The combination of increasing demand for food with high global temperatures poses a large risk to food security. Climate change will potentially affect all aspects of food security such as food access, utilization, and price stability. Impacts on crops and terrestrial foods have already been observed, more of them negative than positive. For example, research has shown that crop yields are sensitive to extreme daytime temperatures around 30 degrees Celsius in a negative sense. The shifts of species' distribution in the ocean discussed above will also have

⁵⁴ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 414; 417; 426.

⁵⁵ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 426.



negative impacts on nutrition and food security. About 17% of all animal protein consumed is provided by the ocean. Shifts in the distribution of marine species will especially have negative impacts on food security for vulnerable people in some tropical developing countries. Climate-related disasters, as well as droughts, are also expected to be important drivers of food insecurity. It is expected that the quality of raw water quality will also reduce, possibly leading to the reduction of drinking water quality as well.⁵⁶

Health

Climate change can affect human health both directly and indirectly. Human health will be influenced directly by extreme heat events, floods, and other extreme weather events. For instance, an increase in heatwaves and fires create an increased risk of injury, disease, and deaths. Indirectly, changes in the environment and ecosystems, as well as impacts that result from changes in societal systems, can affect human health. For instance, the ocean offers resources for drugs. Changes in marine ecosystems may affect these resources. In the near future, climate change will mainly affect human health by exacerbating problems that already exist. Some positive health changes are also projected to happen as a result of climate change such as a reduction in cold-related mortality and morbidity as well as a reduced capacity of disease-carrying vectors. However, the negative consequences for health are expected to outweigh the positive ones.⁵⁷

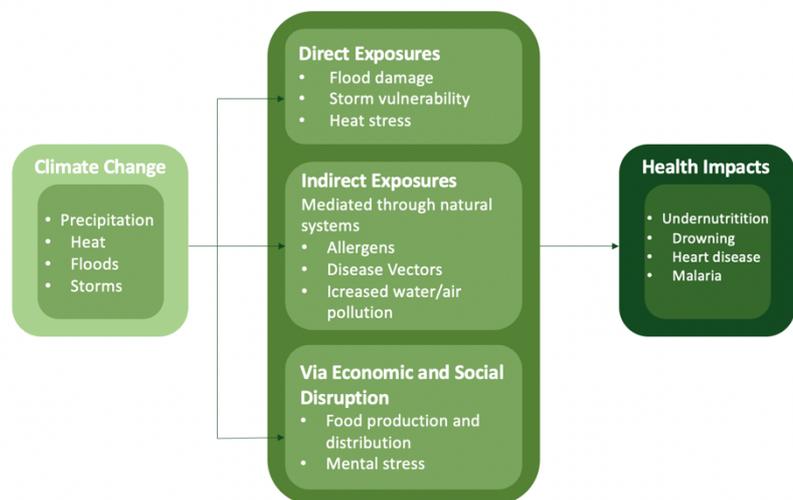


Figure 3: Diagram of the Health Impacts of Climate Change (Source: IPCC, “Climate Change 2014: Impacts, Adaptation, and Vulnerability,” 716.)

⁵⁶ IPCC, “Climate Change 2014: Impacts, Adaptation, and Vulnerability,” 488-489; 507.

⁵⁷ IPCC, “Climate Change 2014: Impacts, Adaptation, and Vulnerability,” 713-714; 741-742.



Security

Security is threatened by climate change in multiple ways. Climate change may undermine the livelihoods of some people. Think for instance of fisheries in areas where marine species will move away. Others may have to migrate although they would rather not. Vulnerable groups might not even be able to migrate because they do not have the resources. However, because migration happens for both many and complex reasons, it will be hard to identify anyone as a climate migrant. Furthermore, states may lack the ability to provide the necessary conditions for security as a result of climate change. Lastly, the climate also affects cultural practices embedded in livelihoods and narratives, world views, identity, community, cohesion, and sense of place. Climate change thus also threatens culture and individual identity.⁵⁸

Inequality

Climate change is expected to impact people in different ways and deepen already existing inequalities between the rich and the poor. People who are already socially marginalized, resource-dependent, and have limited capital assets face bigger risks for their security because of several reasons. For one, climate change intersects with and compounds other drivers of poverty. For example, climate change can lead to higher prices for basic needs, which will have a bigger impact on the poor. Because many poor people lack access to climate forecasts, insurance, government support, and effective response options even small climate changes may lead to chronic poverty. People's assets and livelihoods can be negatively affected by extreme events, for instance. Unintended effects from adaptation and mitigation can also be adverse for the poor.⁵⁹ Okushima, for example, warns of carbon mitigation policies that do not ensure accessible energy resources for the poor.⁶⁰ In terms of health, poor countries and particularly poor children will be burdened the most because they are already exposed to climate-related diseases such as malaria, undernutrition, and diarrhoea.⁶¹

⁵⁸ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 758; 762.

⁵⁹ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 796-798.

⁶⁰ Shinichiro Okushima, "Energy Poor Need More Energy, But Do They Need More Carbon? Evaluation of People's Carbon Needs," *Ecological Economics* 187 (May 2021): 1.

⁶¹ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 742.



Rural areas are particularly vulnerable to the impacts of climate change because they have a greater dependence on agriculture and resources. Moreover, they are vulnerable because of higher levels of poverty, lower levels of education, and neglect by policymakers. 90% of people who live in rural areas live in developing countries. Developing countries will experience substantial impacts of climate change because they are economically dependent on agriculture and natural resources, they have a low capacity to adapt, and because of their geographical locations. Nevertheless, urban areas will also be affected by climate change. As urban areas grow, so do vulnerable urban communities who live in informal settlements. Moreover, there may be impacts on infrastructure systems, services, the built environment, and ecosystem services which interact with other social economic and environmental pressures.⁶²

As was also mentioned before, food security impacts resulting from changes in the ocean will especially affect vulnerable people in some tropical developing countries where there is already high socioeconomic vulnerability. Changes in marine species will mostly affect the poorest fishers and others who are dependent on fisheries.⁶³

Climate change has a range of potential adverse effects, some of which (but by far not all) are outlined above. Climate change impacts many ecosystems along with the services they provide for both humans and other species. Under low-mitigation scenarios, many species face an increased risk of extinction. Human health, food security, and security can be negatively impacted by extreme weather events, changes in ecosystems, and even mitigation and adaptation policies. The impacts of climate change will disproportionately affect the poor, worsening already existing inequality between the rich and the poor. The severity of many impacts will depend on the rate and magnitude of climate change. Thus, climate change is indeed quite pernicious.

⁶² IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 538; 616-618.

⁶³ IPCC, "Climate Change 2014: Impacts, Adaptation, and Vulnerability," 507.



5. How Integrated Oil and Gas Companies Profit from Climate Change

So far, two things have been established: climate change is a market failure and climate change is pernicious. Following the argument of Norman and Heath, companies are behaving unethically when they make a profit from a pernicious market failure. The next question, then, is if fossil fuel companies profit from climate change. In this chapter, I discuss how fossil fuel companies profit from climate change. First, I discuss the magnitude of the contribution of fossil fuel companies to the problem of climate change. Next, I discuss how fossil fuel companies profit from their emissions. I then argue that their knowledge of the problem and their influence on climate policies strengthens their culpability.

Carbon Majors

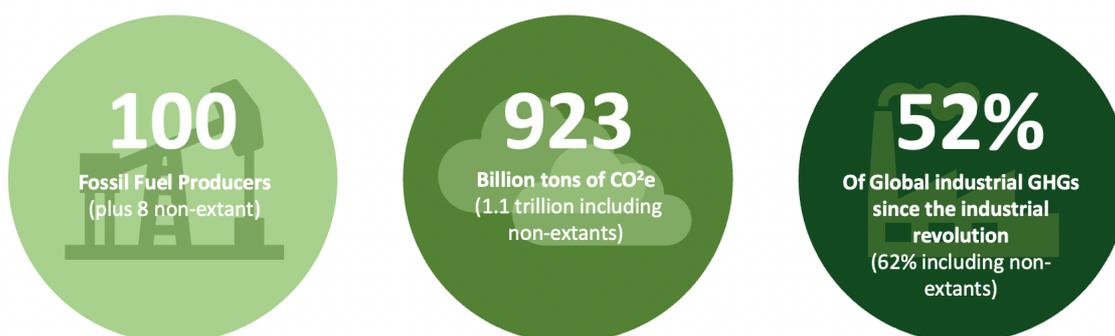


Figure 4: Carbon Majors' Contribution to Greenhouse Gas Emissions (Source: Griffin, "the Carbon Majors Database,"5.)

The majority of greenhouse gas emissions in the world are a result of fossil fuels. In 2015, 91% of global industrial greenhouse gases were emitted by the fossil fuel industry and its products, this was over 70% of all anthropogenic greenhouse gas emissions. Much of these emissions can be traced back to a small number of companies. The Carbon Majors Database has traced the biggest emitters. They have identified 100 'Carbon Majors,' all of them fossil fuel producers, who represent 52% of all global industrial greenhouse gases since the industrial revolution. This includes direct operational emissions of the companies but also emissions from the use of their products. 90% of company emissions result from the combustion of coal, oil, and gas to produce energy. Although the potentially dangerous effects of greenhouse gases have been known for a while, the fossil fuel industry has only become more carbon-intensive. In the period between 1988 and 2016 the fossil fuel industry emitted approximately as much CO₂ as it has emitted over the 237 years between the start of the industrial revolution



and 1988. This makes up 71% of all global industrial greenhouse gas emissions since 1988. The scale of greenhouse gas emissions that have resulted from the fossil fuel industry is so large that it is likely to have had a significant contribution to climate change. According to Griffin, this means that the fossil fuel industry can (and should) play an important role in the global energy transition.⁶⁴

Profiting from Climate Change

To make a profit, the fossil fuel industry has to emit greenhouse gases. After all, the product they sell is fossil fuels, which require emissions both in their retrieval and their use. These emissions lead to a negative externality in the form of climate change and all of its costs. These costs are not paid for by the fossil fuel industry or its customers, allowing fossil fuel companies to make a profit by exploiting the market failure of climate change.

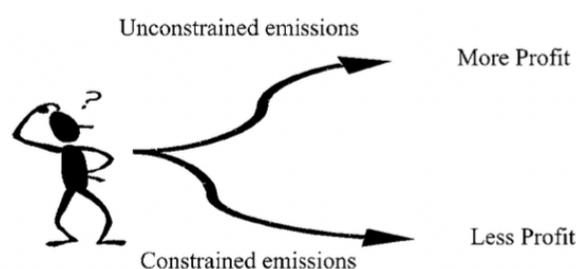


Figure 5: *The Fossil Fuel Industry, Profit, and Emissions* (Source: Le Menestrel, van den Hove, and de Bettignies, "Processes and Consequences in Business Ethical Dilemmas," 255.)

The Oil Industry's Knowledge

At this point, one could argue based on the pernicious market failures argument that the oil industry is and has been behaving unethically. I have shown that climate change is a market failure, it is pernicious, and the oil industry has been profiting from climate change. One might object, however, that fossil fuel companies are not entirely culpable, since they were not aware of the adverse effects of their actions, or at least not until the last few decades. Recently revealed documents, however, paint a different picture.

As early as 1958, a study by the 'Smoke and Fumes Committee,' founded by the Western Oil and Gas Association, aimed at determining the amount of carbon of fossil origin in the atmosphere. Of course, this does not show that they were aware of climate change that early,

⁶⁴ Griffin, "the Carbon Majors Database," 5-8.



but it does show that they were aware of the potential impacts of carbon in the atmosphere. In 1962, the Chief Geology Consultant at Shell, Hubbert, produced a report called *Energy Resources*. In this report, potential effects on the climate are already mentioned. The report reads: “*Since CO₂ absorbs long-wavelength radiation, it is possible that this is already producing a secular climate change in the direction of higher average temperatures. This could have profound effects both on the weather and on the ecological balances.*”⁶⁵ In 1968, a report called *Sources, Abundance, and Fate of Gaseous Atmospheric Pollutants* already warned the fossil fuel industry that CO₂ from burning fossil fuels was accumulating in the atmosphere and that this would likely cause warming of the atmosphere. What was significant about the report was that it already acknowledged that the combustion of fossil fuels was the most likely explanation for the data of rising CO₂ levels. It even emphasised that future research should focus on ways to reduce CO₂ emissions.⁶⁶ From 1979 to 1983 all big oil companies shared their research about the climate in a task force of the American Petroleum Institute (API). In 1982, Exxon already reported that despite uncertainties, there was a clear scientific consensus about the relation between emissions and rising temperatures. To counteract the warming of the earth, the use of fossil fuels would have to be drastically restricted. The fossil fuel industry seems to have been aware of the potentially adverse effects of their products on the climate long before the public. It was not until 1988 that the IPCC was founded and broader attention of the media and politics for climate change started.⁶⁷ Despite its knowledge, the oil industry did little to reduce its impact on the climate.

Whether the oil industry really knew of the dangers of climate change and to what extent remains controversial. After all, many impacts of climate change remain uncertain today. However, in line with the conceptualisation of the atmosphere as a natural common resource, Gardiner argues that it seems odd to argue that those who have deprived others of an important resource, i.e., greenhouse gas emissions, have no responsibility to help those who

⁶⁵M. King Hubbert. *Energy Resources: A Report to the Committee on Natural Resources of the National Academy of sciences* (Washington, DC: The National Academies Press, 1962).

⁶⁶ Center for International Environmental Law (CIEL), *A Crack in the Shell: New Documents Expose a Hidden Climate History*, (2018): 4-6.

⁶⁷ Jelmer Mommers, “Reconstructie: Zo Kwam Shell Erachter Dat Klimaatverandering Levensgevaarlijk Is (En Ondermijnde het Alle Serieuze Oplossingen,” *de Correspondent*, last modified February 28, 2017, https://decorrespondent.nl/6262/reconstructie-zo-kwam-shell-erachter-dat-klimaatverandering-levensgevaarlijk-is-en-ondermijnde-het-alle-serieuze-oplossingen/690128758-e657cfa2_



are deprived simply because they were ignorant of the harm they were causing. This seems even odder when that overuse denies others to extract themselves from the problem caused by the overuse of greenhouse gas emissions.⁶⁸ In any case, fossil fuel companies have known about the harms of climate change and their contribution to it certainly for several decades now. 1990 is often named as the latest time that fossil fuel companies could have become aware of climate change as that is when the IPCC published its first report. Remember that between 1988 and 2016 the fossil industry emitted about as much CO₂ as in the 237 years prior to that,⁶⁹ which means that a substantial amount of greenhouse gases has been emitted by fossil fuel companies since 1990. Given these facts, a lack of knowledge can maximally excuse greenhouse gas emissions up until 1990 and minimally, if convinced by the argument above, cannot excuse any harmful emissions at all.

The Oil Industry's Influence on Climate Policies

Not only has the fossil fuel industry likely known about climate change for a long time, when climate change did gain public and political attention it has undermined effective policies to reduce emissions. In 1989, a group of American oil companies founded the lobby group Global Climate Coalition (GCC). The GCC had two goals: cast doubt about climate science and emphasize that regulation would be too expensive for society. All big American oil companies were members of the GCC. Leading to the climate summit in Kyoto in 1997, the GCC put a lot of effort into influencing public opinions. They spread doubt through commercials, advertorials in newspapers, and memo's for journalists and members of congress.⁷⁰ Moreover, oil companies undermined effective policies. In 1997 Exxon, for instance, sponsored advertising campaigns that emphasized the burden of potentially restrictive climate policies from the UN global climate treaty and that it was unfair that countries such as the United States would have to bear the majority of that burden.⁷¹ Similarly, Shell argued against an overreaction by governments. Shell emphasized the potential economic consequences of overly restrictive measures. All measures that would cost money in the short

⁶⁸ Stephen Gardiner, "Ethics and Global Climate Change," *Ethics* 114 (April 2004): 581.

⁶⁹ Griffin, "the Carbon Majors Database," 5-8.

⁷⁰ Mommers, "Reconstructie."

⁷¹ Marc Le Menestrel, Sybille van den Hove, and Henri-Claude de Bettignies, "Processes and Consequences in Business Ethical Dilemmas: The Oil Industry and Climate Change", *Journal of Business Ethics* 41 (2002): 257-258.



term but had considerable benefits in the future were declared as options that would be regretted. Ironically, a Management Brief from Shell warned that irreversible actions would have to be avoided. When Europe introduced emissions trading in 2003, industries that feared costs lobbied so much for free rights of emissions that some companies were able to make money off of emissions rights instead of it introducing a price incentive to start emitting less. Even seemingly good green initiatives from oil companies may be misleading. Shell, for instance, is in favour of putting a price on CO₂. The catch, however, is that it is against all other climate policies. The reason is that Shell can make a profit off of a CO₂-price because it improves its competitive position as it produces relatively clean natural gas instead of more carbon-intensive stone coal. Companies such as Shell, BP, and Total have also lobbied against obligatory targets for sustainable energy and energy saving in Europe. Instead, Europe should only formulate a CO₂ goal and ensure a high CO₂ price. This would be enough to incentivize the market. To make a long story short, the fossil fuel industry has put significant effort into influencing public opinions and shaping climate policies in their favour, such that it can continue to profit from emitting greenhouse gases.⁷²

That the oil industry has likely known about climate change for a long time has implications for its moral responsibilities. The fact that the fossil fuel industry was leading in the research into climate change and was among the first to be aware of potential adverse effects means that they cannot be excused for their emissions based on that they did not know. Moreover, intuitively it makes them more blameworthy, as they have continued to emit high amounts of CO₂ while knowing that it could cause harm.

The oil industry undermining climate policies has two implications. First, it further strengthens the argument that the behaviour of fossil fuel companies is unethical, beyond fossil fuel companies profiting from a pernicious market failure. After all, the market is supposed to benefit society, but market failures sometimes cause harm instead. Therefore, market failure is often seen as a justification of government intervention in the market. By undermining policies to reduce emissions, the fossil fuel industry undermines the solution to the market failure they are creating. So, not only are fossil fuel companies profiting from a market failure,

⁷² Mommers, "Reconstructie."



but they are also actively undermining solutions to the market failure in order to keep profiting. Second, it undermines their own argument that it is the responsibility of governments to create effective policies under which private companies operate. (Think back to Shell's argument in the climate case.) To shift the responsibility to policymakers while also trying to shape policy seems contradictory. If fossil fuel companies truly believed that it is the responsibility of the government (and the government only) to create effective climate policies, then they would not interfere with those policies. In the words of Norman: *"If a corporate leader in the face of criticism throws up her arms and explains that they have done nothing wrong because they have obeyed all federal, state, and local laws, it is a compelling reply to highlight the resources they have devoted to ensuring that the laws would not be too stringent."*⁷³

Intermediate Conclusion

The argument so far is the following. Exploiting pernicious market failures for profit is unethical. The reasoning behind this is that, as a society, we let companies act in their self-interest by seeking profit because their competition produces benefits for society. However, because of market failures, competition between companies does not always lead to benefits for society. Some market failures even cause harm to society, these are pernicious market failures. When companies make a profit because of a pernicious market failure, they undermine the reason why they are allowed to act in their self-interest in the first place: because it is beneficial for everyone. Instead, they cause harm to society.

Climate change is a pernicious market failure. Climate change is a negative externality produced by, among others, the fossil fuel industry. The emissions that result from the fossil fuel industry have led to a rapid increase in greenhouse gases. These greenhouse gases cause the global average temperature to rise, which affects ecosystems and their services. The impacts of climate change are harmful to both humans and many other species. Climate change can impact human food security, health, and security. Its impacts disproportionately affect the poor, exacerbating already existing inequalities. At the same time, many species face an increased risk of extinction.

⁷³ Norman, "Business Ethics as Self-Regulation," 12.



The fossil fuel industry profits from its emissions. The negative externality it creates in the form of climate change is not accounted for in the economic cost. This allows fossil fuel companies to make more profit than they otherwise would have. To make matters worse, it has possibly been aware of the potential adverse effects of their emissions for over half a century. Despite this, it has actively influenced public opinions and lobbied against climate policies to keep making a profit.

Thus, the fossil fuel industry exploits a pernicious market failure, namely climate change. By doing so they are causing harm to society and undermining the reason why they are allowed to act in their self-interest. It can thus be concluded that the fossil fuel industry has been and is behaving unethically. The next question is how fossil fuel companies can correct their unethical behaviour.



6. How to Correct for Unethical Behaviour

It has been established that the behaviour of fossil fuel companies is unethical. However, nothing is said yet about the responsibilities that this implies. This chapter discusses these responsibilities. First, the argument that responsibilities should actually be shifted to those that use fossil fuels is refuted. Next, the responsibilities of fossil fuel companies are determined using the concept of corrective justice.

Supply and Demand

How should the fossil fuel industry correct its unethical behaviour? Perhaps an easy thing to say is that if greenhouse gas emissions are the cause of harm, then fossil fuel companies should stop emitting greenhouse gases. However, that is easier said than done. After all, much of society is still dependent on fossil fuels to heat houses, provide electricity, for transportation, etc. To simply stop emitting would also cause a lot of harm. For instance, people's basic energy needs would not be met if fossil fuel companies suddenly stopped all greenhouse gas emissions. Basic energy needs are those energy services used for homes that are needed to live a decent and healthy life. What exactly constitutes a decent life is still contested, but there is agreement that there should be some guaranteed level of energy services. At this point, fossil fuels are still necessary to ensure the achievement of people's basic energy needs.⁷⁴ Thus, fossil fuel companies cannot just stop their emissions at once. After all, the fossil fuel industry profits because there is demand for their product. How, then, should fossil fuel companies correct their behaviour?

One might reason that it is not actually the fossil fuel industry that should take responsibility for correcting the market failure of climate change. For corporations, there is a distinction between scope 1, 2, and 3 emissions. Scope 1 and 2 emissions refer to direct emissions from extracting fossil fuels (scope 1) and associated emissions from the supply of electricity, heat, and cooling (scope 2).⁷⁵ Scope 3 emissions arise from the use of sold products as a result of

⁷⁴ Shinichiro Okushima, "Energy Poor Need More Energy, But Do They Need More Carbon? Evaluation of People's Carbon Needs," *Ecological Economics* 187 (May 2021), 2.

⁷⁵ Edgar G. Hertwich and Richard Wood, "The Growing Importance of Scope 3 Greenhouse Gas Emissions from Industry," *Environmental Research Letters* 13 (2018): 1



the combustion of coal, oil, and gas for energy purposes. 90% of total company emissions are scope 3 emissions.⁷⁶ Thus, a large majority of emissions are the result of those who purchase and use the products of the fossil fuel industry. In a sense, those who purchase fossil fuels are also benefiting from the market failure of climate change. Otherwise, they would not buy the product in the first place. Then, should we not hold those companies and individuals that purchase and use fossil fuels responsible rather than the fossil fuel companies that only supply the product? Indeed, it has been argued that the country or company that consumes scope 3 emissions should be held responsible for these emissions, whereas fossil fuel companies should only be held responsible for scope 1 and 2 emissions.⁷⁷

However, by providing fossil fuels in the first place, fossil fuel companies are complicit in scope 3 emissions. Moss and Fraser compare it to someone who sells a gun to someone else while knowing that that the other person intends to shoot someone with it. The person who sells the gun is at least partly to blame because they are selling a gun to someone while knowing that it will cause someone else harm. Similarly, the fossil fuel industry sells its products to many companies and individuals, knowing that, added together, the consumption of these products causes harm. Fossil fuel companies are complicit because they know their actions eventually lead to harm and that their actions substantially contribute to this harm.⁷⁸ This is not to deny that the consumers of fossil fuels have any responsibility for the harm of their emissions. Fossil fuel companies, however, are not absolved from any responsibility for scope 3 emissions either. This intuition of partial responsibility is also reflected by the verdict in the legal case of Milieudefensie against Shell. Shell does not have a legal obligation to reduce scope 3 emissions by 45%, as is the case for their own emissions, but it is required to show that it is making an effort to reduce those emissions.⁷⁹ The culpability of fossil fuel companies for scope 3 emissions is strengthened by their lobbying and influence on climate policies, which influences the demand for their product. Moreover, these companies have had the capacity to reduce their harmful impacts and to change their business models such that they

⁷⁶ Griffin, "The Carbon Majors Database," 5.

⁷⁷ Jeremy Moss and Persephone Fraser, "Australia's Carbon Majors," Practical Justice Initiative, UNSW (2019): 12.

⁷⁸ Moss and Fraser, "Australia's Carbon Majors," 13.

⁷⁹ De Weijer and Hotse Smit, "Historische Uitspraak in Klimaatzaak: Shell Moet CO₂ Uitstoot Drastisch Verminderen,"



are not as reliant on carbon.⁸⁰ On a more practical note, instruments that target the supply-side of fossil fuels by constraining and/or influencing the production of fossil fuels are believed to have advantages both in terms of politics as well as economics.⁸¹ Lazarus and van Asselt, for instance, identify several advantages of supply-side policies (in combination with demand-side policies). They show that the combination of supply-side policies with demand-side policies would lead to greater emission reductions while having the same or even lower costs than demand-side policies alone. Moreover, if there are no restrictions for fossil fuel companies, then this may create lock-in effects for the use of carbon that make it difficult for ‘cleaner’ alternatives to compete with fossil fuels. Supply-side policies reduce these effects. Lastly, supply-side policies may add pressure on society to have more active climate change mitigation.⁸² To repeat, following Norman’s framework, if there are good reasons for the regulation of companies then these may also provide good reasons why companies should self-regulate in the absence of these regulations.

So, fossil fuel companies are (partly) responsible for scope 3 emissions (as well as scope 1 and 2 emissions) because they are complicit in the harm these emissions cause by enabling companies and individuals to make use of fossil fuels while knowing the harms of this use. This responsibility is strengthened by the fossil fuel industry’s efforts to influence climate policies to keep demand for fossil fuels as well as reduce competition from renewable energy sources. The advantages of regulation on the supply side provide an additional argument for holding fossil fuel responsible in the absence of government regulation. The question remains, however, what this responsibility should look like.

Corrective Justice

Since fossil fuel companies have been behaving unethically for some time, an appropriate normative concept to use seems to be corrective justice. Humphreys summarizes corrective justice with the following principle: “*A is engaging in activities that are wrongfully injuring B,*

⁸⁰ Marco Grasso and Katia Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” *Environmental Values* 29 no.2 (April, 2020): 181.

⁸¹ Grasso and Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” 179.

⁸² Michael Lazarus and Harro van Asselt, “Fossil Fuel Supply and Climate Policy: Exploring the Road Less Taken,” *Climate Change* 150 (2018): 10.



so A should 1) desist from these harmful actions and 2) compensate B for any injuries experienced.”⁸³ The principle of corrective justice includes both a forward-looking responsibility (desisting from harmful actions) as well as a backward-looking responsibility, (compensating for injuries experienced). This principle seems appropriate in the case of fossil fuel companies. The fossil fuel industry is engaging in activities that are wrongfully injuring humanity as well as many other species and ecosystems by profiting from a market failure. This market failure is climate change (a negative externality), which the fossil fuel profits from by contributing to emissions of greenhouse gases that eventually lead to climate change. So, it will be the moral responsibility of fossil fuel companies to desist from their harmful actions as well as compensate those who are harmed by their actions.

Desisting from Harm

Let’s start with the first responsibility: desisting from the actions causing harm. As the harm comes from emitting greenhouse gases, there are two ways that a fossil fuel company could desist from causing harm: transforming their current and future operations to be carbon neutral or phasing out their operations altogether.⁸⁴ In other words, fossil fuel companies need to decarbonise. This requires fossil fuel companies to extensively and systematically reduce carbon emissions by their products and overall activity. Not just operations, but the products themselves must be decarbonised, as the fossil fuel industry distributes fossil fuels to the global economy.⁸⁵ Fossil fuel companies can transform their activities in multiple ways. One way is to offset emissions, for instance by planting trees or capturing and storing carbon. Of course, these offsets would have to be effective, reliable, and long-term. With offsetting, however, there is a risk that fossil fuels continue to be the dominant energy source because of their continued use, development, and support, creating lock-in effects for the energy sector. When resources are invested into fossil fuels, this may reduce investments in the development of renewable energy sources. But fossil fuels, even with offsetting techniques, pose a higher risk of climate change than renewable energy. Moreover, fossil fuel companies may continue to support campaigns in favour of the use of fossil fuels. Even carbon-neutral companies may then still contribute to the likelihood of climate change by funding lobbying

⁸³ Stephen Humphreys, *Human Rights and Climate Change*, (Cambridge: Cambridge University Press, 2010): 40.

⁸⁴ Moss and Fraser, “Australia’s Carbon Majors,” 17.

⁸⁵ Grasso and Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” 187.



groups that advertise the benefits of fossil fuels. Thus, offsetting will likely reduce harm, but phasing out activity will certainly remove harm. After all, it is preferable to entirely remove the harm being done than to just reduce the harm and risk continuing doing harm. In that light, offsetting should only be a temporary policy.⁸⁶

Another option is to divest from greenhouse gas-emitting parts and instead invest in new green developments. This way, the company can continue to exist as an energy company. Importantly, divesting by selling carbon-intensive assets will not actually reduce harm. After all, if fossil fuel assets are sold to another company, then that company will simply continue to exploit them. The fossil fuel company is still complicit in that case, by providing a working fossil fuel business for others. A better way of divesting would be to retire the assets safely and sustainably. This will be more costly for fossil fuel companies and they may respond that they have a duty to their shareholders to make a profit.⁸⁷ However, I have shown that profiting from climate change is unethical. It seems wrong to argue that fossil fuel companies have a duty to their shareholders to profit in an unethical way. Therefore, the responsibility of fossil fuel companies to desist from harm overrides their responsibility towards shareholders to make a profit.

A more effective, but also more radical, option is to phase out the operations that contribute to climate change. This would require ending the production and sale of fossil fuels over time. The faster these operations are phased out, the less climate harm will occur. But, as mentioned earlier, suddenly stopping the production of fossil fuels is unfeasible. Moreover, some emissions may still be permissible if they are in line with climate goals. Phase-outs have an advantage to transformation because stopping the production and sale of fossil fuels reduces the risk of harm more, as transformation has a higher risk of continued emissions.⁸⁸

The most reasonable way to desist from harm is a combination of transformation and phasing out. Immediately phasing out the production and sale is unfeasible in most cases, as much of society is still dependent on fossil fuels. Where operations continue, fossil fuel companies

⁸⁶ Moss and Fraser, "Australia's Carbon Majors," 17-18.

⁸⁷ Moss and Fraser, "Australia's Carbon Majors," 18-19.

⁸⁸ Moss and Fraser, "Australia's Carbon Majors," 20-21.



should transform their business models to be as carbon neutral as possible. This is to ensure that minimal harm will come from additional emissions. Eventually, fossil fuel companies should phase out the production and sale of fossil fuel companies entirely to ensure that there are no longer risks of climate change.⁸⁹ A phase-out needs to be a real and urgent goal in order to avoid a business-as-usual scenario. When phasing out is a goal somewhere far into the future and emissions are also only cut far into the future, it likely reflects a poor commitment to climate change mitigation.⁹⁰ Determining how fast fossil fuel companies should phase out their carbon-intensive activities is outside the scope of this thesis.

Desisting from harm also entails ceasing actions to influence climate policies. By trying to ensure that policies remain fossil fuel friendly, the fossil fuel industry contributes to the harm of climate change. To fulfil their responsibility, fossil fuel companies need to stop harmful emissions as well as lobbying, funding think tanks, influencing public opinions etc.⁹¹

It is important to note that not all fossil fuel companies are the same, and their responsibilities may thus differ. The responsibilities described above are still very broad. The burdens of decarbonisation would have to be distributed over fossil fuel companies. How exactly that would have to be distributed is outside of the scope of this thesis. However, a normative framework for the distribution may include morally relevant facts such as the cumulative emissions of a company, but also whether some operations are still necessary to meet basic needs for energy, whether some countries had more need for the production of fossil fuels to continue, whether there are fossil fuel companies that are (or have been) extracting shares of fossil fuel resources that are unfairly large, etc.⁹²

Compensating the Injured

Compensating those who experienced injuries is more difficult. For one, although a harmful amount of greenhouse gases has already been emitted, because of the time lag of climate change many injuries have not been experienced yet. Because of uncertainties in when and

⁸⁹ Moss and Fraser, "Australia's Carbon Majors," 22.

⁹⁰ Moss and Fraser, "Australia's Carbon Majors," 21.

⁹¹ Moss and Fraser, "Australia's Carbon Majors," 19; 20.

⁹² Grasso and Vladimirove, "A Moral Analysis of Carbon Majors' Role in Climate Change," 187; Moss and Fraser, "Australia's Carbon Majors," 21.



where climate change will cause harm it is virtually impossible to identify who should receive compensation. Compensation in the form of restitution is just as difficult, as it is nearly impossible to identify what exactly should be restituted. A more appropriate way of compensation may be disgorgement, also called profit-sharing. Disgorgement entails transferring profits from harmful activities to those harmed and/or, in this case, to climate change mitigation or adaptation to reduce harm. The advantage of disgorgement is that there is no need to identify a particular person who receives the compensation nor a need to know how that person would have been if he or she had not been wrongfully harmed.⁹³ This makes it a much more feasible form of compensation than directly compensating those harmed or restitution.

Profits made in the past can, of course, not all be disgorged. For one, not all of these profits are necessarily unethical because at least in part they may be excused by a lack of knowledge. Although the fossil fuel industry was likely aware of possible harms of climate change earlier, from 1990 it can be said with certainty that the fossil fuel industry was aware of the harms it was causing. These profits are thus certainly ‘tainted,’ as Grasso and Vladimirove call it.⁹⁴ Some may argue that a lack of knowledge does not excuse any historical emissions and some may argue that there is evidence that the fossil fuel industry knew about climate change much earlier than 1990. However, there exists no controversy over the knowledge of fossil fuel companies from 1990 and forward. Thus, these profits have certainly been made in an unethical matter. But another problem with past profits is that they have already been distributed to shareholders, employees, and used to invest.⁹⁵ What the responsibilities are of others who have received profits from fossil fuel companies is outside the scope of this thesis.

Some things may be said, however, about future profits. Future profits made from the production and sale of fossil fuels should be, at least partly, disgorged. Although disgorgement does not require specific identification of an injured party, it would make sense that those who are most vulnerable to the harmful impacts of climate change should receive the compensation that results from disgorgement. For one, this would reduce harm most

⁹³ Grasso and Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” 188.

⁹⁴ Grasso and Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” 188-189.

⁹⁵ Grasso and Vladimirove, “A Moral Analysis of Carbon Majors’ Role in Climate Change,” 189.



effectively, since the most vulnerable have the lowest capacity to cope with the harmful effects of climate change. Moreover, it is in line with Shue's third principle of equity, which states the following: "*When some people have less than enough for a decent life, other people have far more than enough, and the total resources available are so great that everyone could have at least enough without preventing some people from still retaining considerably more than others have, it is unfair not to guarantee everyone at least an adequate minimum.*"⁹⁶ Those who are most vulnerable are (at risk of) living below the minimum of a decent life. Disgorging profits to help those who are most vulnerable aims at guaranteeing even the most vulnerable the minimum for a decent life.⁹⁷ Lastly, since it is the poor who are most vulnerable and it is mostly the rich that have caused climate change, it seems fair that the poor are compensated. If climate change is conceived of as a common resource problem, then the earth has a limited capacity of absorbing anthropogenic greenhouse gas emissions. The rich have overused their share of emissions, both depriving the poor of an opportunity for use (and the consequent development) as well as harming them by contributing to climate change.⁹⁸ Thus, the poor should receive compensation. This may also imply different responsibilities for different companies depending on in which countries they are operating.

As decarbonisation is costly, profits may also be allocated to the investment in decarbonisation. After all, it would make no sense for fossil fuel companies to keep profiting from the production and sale of fossil fuels to compensate for their harms because they would keep contributing to further harms.⁹⁹ Thus, the disgorgement of future profits has to financially allow fossil fuel companies to fulfil their responsibility of decarbonising. Over time, more and more profits would be disgorged as decarbonisation will become less costly.¹⁰⁰ Profits made from decarbonised operations should not be disgorged, as these are no longer contributing to harm. This is not only fair but may also incentivise fossil fuel companies to decarbonise quicker as they will be able to keep profits from decarbonised operations.

⁹⁶ Henry Shue, "Global Environment and International Inequality," *International Affairs* 75 no.3 (1999): 541.

⁹⁷ Grasso and Vladimirove, "A Moral Analysis of Carbon Majors' Role in Climate Change," 189-190.

⁹⁸ Gardiner, "Ethics and Global Climate Change," 581.

⁹⁹ Moss and Fraser, "Australia's Carbon Majors," 19.

¹⁰⁰ Grasso and Vladimirove, "A Moral Analysis of Carbon Majors' Role in Climate Change," 189.



To summarize, to correct for their unethical behaviour, fossil fuel companies have to desist from causing harm and compensate those who have experienced injuries. In order to desist from causing harm, fossil fuel companies should decarbonise. Fossil fuel companies should start by transforming their business models to become less carbon-intensive, eventually phasing out the production and sale of fossil fuels completely. How fast companies should do this will differ for different fossil fuel companies. A normative framework is needed to determine how the burdens of decarbonisation should be distributed among fossil fuel companies. Compensating for injuries is more difficult, as the time and spatial lag make it nearly impossible to determine who the recipients should be of compensation. Disgorgement is a useful way of compensation because it does not require the identification of a particular recipient. Fossil fuel companies should disgorge their tainted profits. These profits should be used to compensate the most vulnerable. Some will find these responsibilities overly stringent. However, given the urgency of climate change and the causal responsibility of fossil fuel companies, stringent responsibilities seem necessary to reduce any further harm as much as possible and sanction the unethical behaviour of fossil fuel companies that has already caused harm.



7. Conclusion

To conclude, fossil fuel companies have a moral responsibility to decarbonise by transforming their business and eventually phase out the production and sale of fossil fuels entirely. They also have the responsibility to disgorge any further profits made from the production and sale of fossil fuels, as well as profits made in the past at least from 1990, where possible.

To determine this responsibility, I started with the normative framework of Norman. Norman argues that to determine the responsibilities of corporations, one should use the same methods and tools as one might use to determine whether governments should have regulation for corporations. If there is a good normative reason why governments should regulate corporations, then that may also provide a good normative reason for corporations to self-regulate in the absence of regulation from governments.¹⁰¹

Heath's market failures approach fits neatly with this framework. Market failure is usually seen as a justification for governments to intervene in the market but can also provide a starting point for normative analysis of firms. Firms compete with each other to make a profit. This is justified because when corporations act in their own interest by seeking profit, this is beneficial to society. This beneficial outcome, however, requires certain conditions that are usually not fulfilled in the real world. Thus, market failures occur, which is not beneficial to society. When firms profit from market failures, they are behaving unethically because the reason we allow firms to act in their self-interest and seek profit is that it is beneficial to society. When firms profit from market failures, this is undermined.¹⁰² Norman does point out that it is not realistic to always judge firms that profit from market failures as unethical. So, instead, Norman argues that firms are behaving unethically when they profit from pernicious market failures, i.e. market failures that are harmful to society or clearly irresponsible.¹⁰³ Fossil fuel firms could thus be argued to be behaving unethically if they are profiting from a pernicious market failure.

¹⁰¹ Norman, "Business Ethics as Self-Regulation," 6.

¹⁰² Heath, "Business Ethics Without Stakeholders," 549-552.

¹⁰³ Norman, "Business Ethics as Self-Regulation," 11.



Climate change is a market failure. Climate change is a result of anthropogenic greenhouse gases in the atmosphere, which enhance the greenhouse effect by absorbing more heat, causing a rapid increase in global average temperatures. Higher temperatures affect the climate in multiple ways. Climate change is a negative externality of the market, one form of market failure. The market emits greenhouse gases, causing climate change. The costs of climate change are not captured by the economic price. Third parties who are not part of the market transaction have to pay these costs. This is clearly not an efficient allocation of resources, nor beneficial to society. Climate change can be conceived of as a public good problem or a common resources problem. In the case of a public good, the environment is seen as a good public good, but people are not willing to pay for this good, i.e. the costs of protecting the environment, as they can enjoy it without paying for it. In the case of a common resource, the atmosphere is a common resource with a limited capacity for absorbing greenhouse gases. When some overuse their share of emissions, others are deprived of their share and harm is caused in the form of climate change. In both cases, it is an externality that causes the issue.

Climate change is pernicious. Climate change poses risks in many different ways. Terrestrial, freshwater, and ocean ecosystems may all change as a result of climate change. Ecosystems are linked to human systems in complex ways and provide protection, food resources, as well as cultural resources to humans. Humans as well as other species will be exposed to more extreme weather events such as heatwaves, droughts, and floods. Many species face an increased risk of extinction. Climate change may have adverse impacts on human food security, health, and security. It will likely deepen already existing inequalities between the rich and the poor, as the poor are disproportionately vulnerable to negative effects from climate change. In short, climate change may cause a lot of harm if not mitigated.

Fossil fuel companies are and have been profiting from climate change. They are a very large contributor to greenhouse gas emissions and likely have had a significant effect on the climate. Because they do not pay for the negative effects of their emissions (nor is it incorporated in the price of fossil fuels), fossil fuel companies profit from their emissions. Whether a lack of knowledge can excuse historical emissions is contested. In any case, fossil



fuel companies have known of climate change since the early 1990s, after which a substantial number of emissions were still emitted. Moreover, they have put considerable effort in influencing climate policies and public opinions in order to keep profiting. This undermines their own argument that it is up to governments to create appropriate climate policies and fossil fuel companies should merely comply with the law. Moreover, it undermines governments' efforts to find a solution to the market failure they are contributing to.

Thus, fossil fuel companies are profiting from a pernicious market failure and in doing so are, and have been, behaving unethically. Usually, when an agent behaves unethically, we expect a correction of the unethical behaviour. Corrective justice requires a party that engages in activities that are wrongfully harming others to desist from the activities that cause harm as well as compensate those who are harmed. Fossil fuel companies should reduce harm by decarbonising, eventually phasing out the production and sale of fossil fuel entirely to ensure that there are no risks of further harm. To compensate those harmed by emissions, fossil fuel companies should disgorge profits made from the production and sale of fossil fuels. These profits should be used to compensate those who are most vulnerable to climate change.

This ethical analysis shows parallels with the verdict of the court in the legal case of Milieudefensie against Shell. The court decided that Shell had to reduce its emissions significantly. This conclusion was reached based on a number of factors, including the potential harms of climate change described by the IPPC, the high amount of emissions emitted by Shell, and compensation for wrongful acts against others.¹⁰⁴

Further research may be developing a normative framework for distributing these responsibilities between different fossil fuel companies, determining at what time the production and sale of fossil fuels should be phased out completely, and determining what the responsibilities are of those who have received profits from fossil fuel companies.

¹⁰⁴ Stibbe, "Climate Case Milieudefensie et al. – The Hague District Court Orders Shell to Reduce CO₂ Emissions," last modified June 7, 2021, <https://www.stibbe.com/en/news/2021/june/climate-case-milieudefensie-et-al--the-hague-district-court-orders-shell-to-reduce-co2-emissions>



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