WORKING paper

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The Impossible Love of Fossil Fuel Companies for Carbon Taxes

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ABSTRACT

Economists agree that carbon taxes are the most effective solution for climate change mitigation. But where do fossil fuel companies stand on carbon taxes? I analyse how the 100 largest oil and gas companies communicate on carbon taxes. Surprisingly, I find that 54% of companies that have a policy view on carbon taxes support them (78% for the 50 largest). This is puzzling as an effective carbon tax should reduce revenues and reserve value of fossil fuel companies. I present a conceptual trilemma model showing that fossil fuel companies' existence is threatened by a carbon tax. To understand this paradox, I offer non-mutually exclusive reasons why fossil fuel companies might support carbon taxes. Oil and gas companies could use a carbon tax to get rid of the competition from coal, create a level playing field and remove regulatory uncertainty. Or they think that these taxes will not affect them because demand for oil and gas is inelastic or that international coordination will fail and lead to leakages. Finally, it could be that this is simply a communication exercise and that a carbon tax helps them shift the responsibility for climate change from fossil fuel companies to customers, voters and elected officials.

Keywords: Carbon Tax, Fossil Fuel Companies, Emission Mitigation, Carbon Taxation

JEL classification: L71, Q38, Q48, Q54

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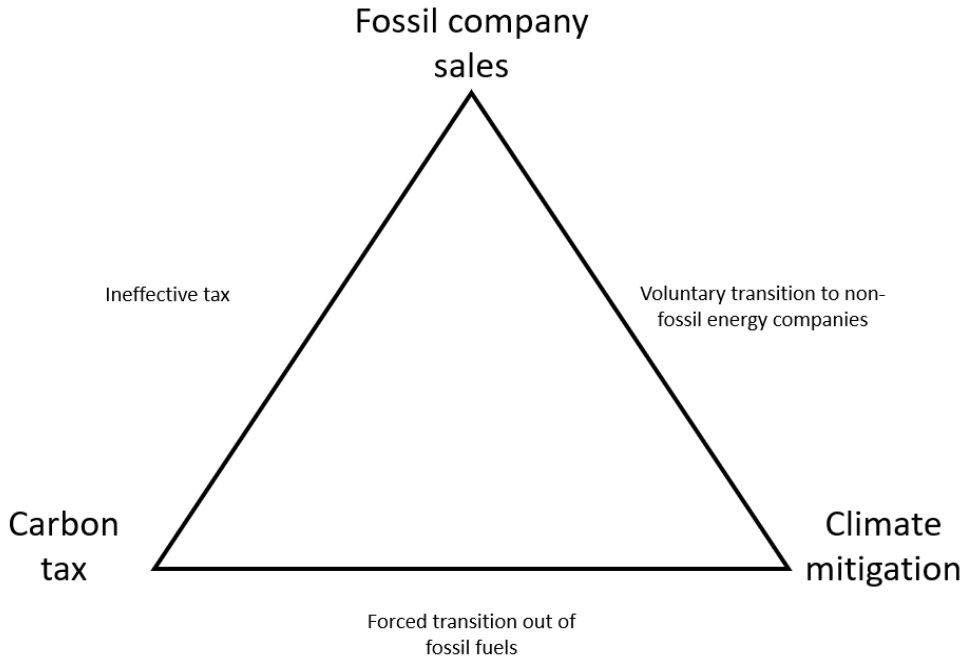
NON-TECHNICAL SUMMARY

Economists rarely agree on issues, but on carbon taxes, they do. They agree so much that 3354 economists, including many Nobel Prize winners, recently signed an open letter supporting the introduction of a carbon tax. But what is more puzzling, is that fossil fuel companies seem to agree as well. Building up a new dataset, I find agreement rates as high as 78% when looking at the top 50 largest oil and gas companies who have expressed their opinion on the question. It is worth noting that only 60% of the largest companies and 56% of the smaller ones had a position on carbon taxes. Russian companies for example do not communicate on the topic while two third of Canadian companies do (Canada does have a carbon tax system in place). I ask why fossil fuel companies are so active promoting the introduction of carbon taxes? I offer a survey of the largest fossil fuel companies and analyse their take on carbon taxes in their different communications.

The paper first looks at a conceptual trilemma model of fossil fuel companies and carbon taxes (see figure below). The model informs that there are only three possible options. An effective carbon tax that reduces emissions but also reduces sales by fossil fuel companies. An ineffective carbon tax which is compatible with continued sales for fossil fuel companies. Or voluntary transition by fossil fuel companies into broader energy companies, which would reduce emissions and does not require a carbon tax. The model, as any conceptual model, has its limitations, but it informs the discussion.



Analysing the corporate communications of the 100 largest oil and gas companies, I then present some quantitative evidence of the current support from fossil fuel companies for carbon taxes. Finally, in the discussion part, I offer several non-mutually exclusive reasons why fossil fuel companies support carbon taxes, despite the trilemma framework showing it goes against their interests.

A carbon tax, economists argue, could increase the price of pollution (an externality) and create a market incentive to emit less CO_2. But carbon taxes have been the best available solution for four decades now and have not been put in place in a way that mitigates climate change globally. There have been some regional taxes introduced in Canada, Denmark, Norway, Europe with the ETS system and South Africa, among many examples. The World Bank lists carbon taxes currently in place. To date, there are 73 carbon taxes implemented in

various jurisdictions representing 23% of global emissions. Yet despite these taxes, global emissions have still been increasing according to the IPCC. That is not to say that the taxes have not reduced emissions, but in their current form and level, they are not enough to tackle the increase in global emissions, responsible for anthropogenic climate change.
Part of the issue lies in international coordination and the risk of carbon leakages. Economists are working on solutions to overcome these coordination problems. One recently discussed proposal is the introduction of carbon border taxes. These taxes would target imports from countries with no carbon taxes, therefore allowing for effective carbon taxes to be implemented, without excessively jeopardising EU trade competitiveness, even before international coordination on the issue is achieved. One promising example of such a border tax is the proposed European Carbon Border Adjustment Mechanism (CBAM) from the European Commission. The IMF is also currently working on a carbon floor framework that would allow countries of different income levels to have different carbon taxes.
But this paper does not delve into the political economy of carbon tax implementation. Instead it simply asks why fossil fuel companies (or oil and gas companies to be precise) have recently taken public positions in favour of carbon taxes. Why would bakers lobby for a tax on wheat? Here again the point is not to offer a definitive answer, but rather to present the fact of the relatively broad support and venture on some potential explanations.

L'amour impossible des compagnies de combustibles fossiles pour les taxes carbone

RÉSUMÉ

Les économistes s'accordent à dire qu'une taxe carbone constitue la solution la plus efficace pour atténuer le changement climatique. Mais quelle est la position des entreprises de combustibles fossiles sur les taxes carbone? J'ai analysé la communication des 100 plus grandes compagnies pétrolières et gazières sur les taxes carbone. Il est surprenant de constater que 54 % des entreprises exprimant une opinion sur les politiques économiques fondées sur les taxes carbone soutiennent ces dernières (78 % pour les 50 plus grandes). Ce résultat est surprenant, car une taxe carbone efficace devrait réduire les revenus et la valeur des réserves des entreprises de combustibles fossiles. Je présente un modèle conceptuel de trilemme montrant que l'existence des entreprises de combustibles fossiles est menacée par une taxe carbone. Pour comprendre ce paradoxe, je propose des raisons non mutuellement exclusives pour lesquelles les entreprises de combustibles fossiles pourraient soutenir les taxes carbones. Les compagnies pétrolières et gazières pourraient utiliser une taxe carbone pour se débarrasser de la concurrence du charbon, créer des conditions de concurrence équitables et éliminer l'incertitude réglementaire. Elles peuvent aussi penser que ces taxes ne les affecteront pas parce que la demande de pétrole et de gaz est inélastique ou que la coordination internationale échouera et entraînera des fuites. Enfin, il se peut qu'il s'agisse simplement d'un exercice de communication et qu'une taxe carbone les aide à déplacer la responsabilité en matière de changement climatique des entreprises de combustibles fossiles vers les clients, les électeurs et les représentants élus.

Mots-clés : taxe carbone, entreprises de combustibles fossiles, réduction des émissions, taxation du carbone

1. Introduction

Economists rarely agree on issues, but on carbon taxes, they do. They agree so much that 3354 economists, including many Nobel Prize winners, recently signed an open letter supporting the introduction of a carbon tax.[1] But what is more puzzling, is that fossil fuel companies seem to agree as well. Building up a new dataset, I find agreement rates as high as 78% when looking at the top 50 largest oil and gas companies who have expressed their opinion on the question. I ask why fossil fuel companies are so active promoting the introduction of carbon taxes? I offer a survey of the largest fossil fuel companies and analyse their take on carbon taxes in their different communications.

The paper first looks at a conceptual trilemma model of fossil fuel companies and carbon taxes. The model informs that there are only three possible options. An effective carbon tax that reduces emissions but also reduces sales by fossil fuel companies. An ineffective carbon tax which is compatible with continued sales for fossil fuel companies. Or voluntary transition by fossil fuel companies into broader energy companies, which would reduce emissions and does not require a carbon tax. The model, as any conceptual model, has its limitations, but it informs the discussion.

Analysing the corporate communications of the 100 largest oil and gas companies, I then present some quantitative evidence of the current support from fossil fuel companies for carbon taxes. Finally, in the discussion part, I offer a qualitative analysis that presents the reasons fossil fuel companies give in favour or against a carbon tax. This qualitative part helps inform several non-mutually exclusive reasons why fossil fuel companies support carbon taxes, despite the trilemma framework showing it goes against their interests. This last part is presented as an avenue for further research, more than a definitive take on the question.

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[1] "To maximize the fairness and political viability of a rising carbon tax", *The Wall Street Journal*, 16 January 2019, and an updated list of signatories available here https://www.econstatement.org/original-cosignatories.

A carbon tax, economists argue, could increase the price of pollution (an externality) and create a market incentive to emit less CO2 (Marron and Toder 2014). But carbon taxes have been the best available solution for four decades now (Nordhaus 1982) and have not been put in place in a way that mitigates climate change globally. There have been some regional taxes introduced in Canada, Denmark, Norway, Europe with the ETS system and South Africa, among many examples. The World Bank lists carbon taxes currently in place.[2] To date, there are 73 carbon taxes implemented in various jurisdictions representing 23% of global emissions. Yet despite these taxes, global emissions have still been increasing (IPCC 2021). That is not to say that the taxes have not reduced emissions, but in their current form, they are not enough to tackle the increase in global emissions, responsible for anthropogenic climate change.

Part of the issue lies in international coordination. Economists are working on solutions to overcome these coordination problems. One recently discussed proposal is the introduction of carbon border taxes. These taxes would target imports from countries with no carbon taxes, therefore allowing for effective carbon taxes to be implemented even before international coordination on the issue is achieved. One promising example of such a border tax is the proposed European Carbon Border Adjustment Mechanism (CBAM) from the European Commission (Bellora and Fontagné 2022). The IMF is also currently working on a carbon floor framework that would allow countries of different income levels to have different carbon taxes (Parry, Black, and Roaf 2021).

Fossil fuel companies and their communication on climate change have generated a great deal of literature. Dietz et al. (2018) look at companies with high CO2 emissions and show that 85% of their sample have published policies on climate change. It is not uncommon for high polluting companies to take a stance on climate change. Oil and gas companies have also taken steps to publish policies in climate mitigation, such as the Oil and Gas Climate Initiative (Bach

[2] See https://carbonpricingdashboard.worldbank.org/.

2019). Historical engagement with decarbonization of fossil fuel companies, however, calls for caution on future decarbonization plans (Kenner and Heede 2021; Boon 2019).

Green et al. (2021) show that fossil fuel companies have not yet started to shift away from fossil fuel, despite some communications indicating a will for decarbonization. One exception remains Ørsted, which recently managed to shift away from fossil fuels (Abraham-Dukuma 2021).

Hopkins (2016) suggests that one of the reasons ExxonMobil could be supporting a carbon tax is that it would help shift from high-CO2-emitting coal, to oil and gas which have lower emissions. Nasiritousi (2017) shows that most of the 10 largest fossil fuel companies favour a market carbon pricing mechanism. And that they publicly acknowledge their role in climate change.

There is also a whole strand of literature in political economy that looks at issues behind the implementation of a carbon tax and their acceptability (Gevrek and Uyduranoglu 2015; Bristow et al. 2010; Douenne and Fabre 2020). One noteworthy recent contribution by Douenne and Fabre (2022) offers key insights. They offer empirical evidence showing that political support of carbon taxes is weak. When surveyed and offered to be richer at the end of the year but having to pay a carbon tax, survey participants still opposed carbon taxes (Douenne and Fabre 2022). This finding suggests that carbon taxes might still have a long road ahead of them before effectively addressing the issue of human generated carbon emissions.

This paper also dialogues with the literature on the green paradox (Michielsen 2014; Schneider 2023; van der Ploeg and Withagen 2015; Cairns 2014; Jaakkola 2019). The announcement of a green policy can act like the announcement of a future expropriation of fossil asset holders, pushing them to accelerate extraction. Coulomb and Henriet (2018) show that owner of a relatively cleaner energy source (such as oil or cleaner oil) might benefit from a tax on a dirtier energy source (coal or dirtier oil). The findings in this paper a compatible with the idea that support for a carbon tax might be rational for cleaner oil producers, which would be less affected than coal producers. Michielsen (2014) shows that oil producers might also delay production today, knowing that coal might be affected by a carbon tax tomorrow.

But this paper does not delve into the political economy of carbon tax implementation. Instead it simply asks why fossil fuel companies (or oil and gas companies to be precise) have recently taken public positions in favour of carbon taxes. Why would bakers lobby for a tax on wheat? Here again the point is not to offer a definitive answer, but rather to present the fact of the relatively broad support and venture on some potential explanations.

2. The impossible trilemma of carbon taxes, fossil fuel revenue and climate change mitigation

The burning of fossil fuels led to global warming and the current climate crisis. It accounts for 94% of global emissions in 2020 (cement and other industry uses make up the rest).[3] If we want to reduce global CO2 emissions, less fossil fuel will need to be burned (IPCC 2021).[4] Fossil fuel companies can either change their business to progressively exclude fossil fuels, or hope for a failed transition. Fossil fuel companies making profit selling large quantities of fossil fuels is by definition incompatible with climate change mitigation, at least with the current state of available technologies.

As shown in this paper, a large part of oil and gas companies support a carbon tax. But an *effective* carbon tax would by definition at some point need to reduce sales of fossil fuel companies. These companies could transition and reconvert into other energy related businesses. But if a carbon tax fulfils its purpose (burning less fossil fuels), oil and gas companies are meant to see their sales go down progressively. Or transition. There is no third option where fossil fuel companies make large fossil fuel sales and emissions are mitigated. If an ineffective carbon tax is implemented, it could well be that fossil fuel supply remains unchanged.

The goal of a carbon tax is to reduce the volume of fossil fuel burned and therefore the quantity of fossil extracted. Fossil fuel companies could potentially still be profitable with an effective

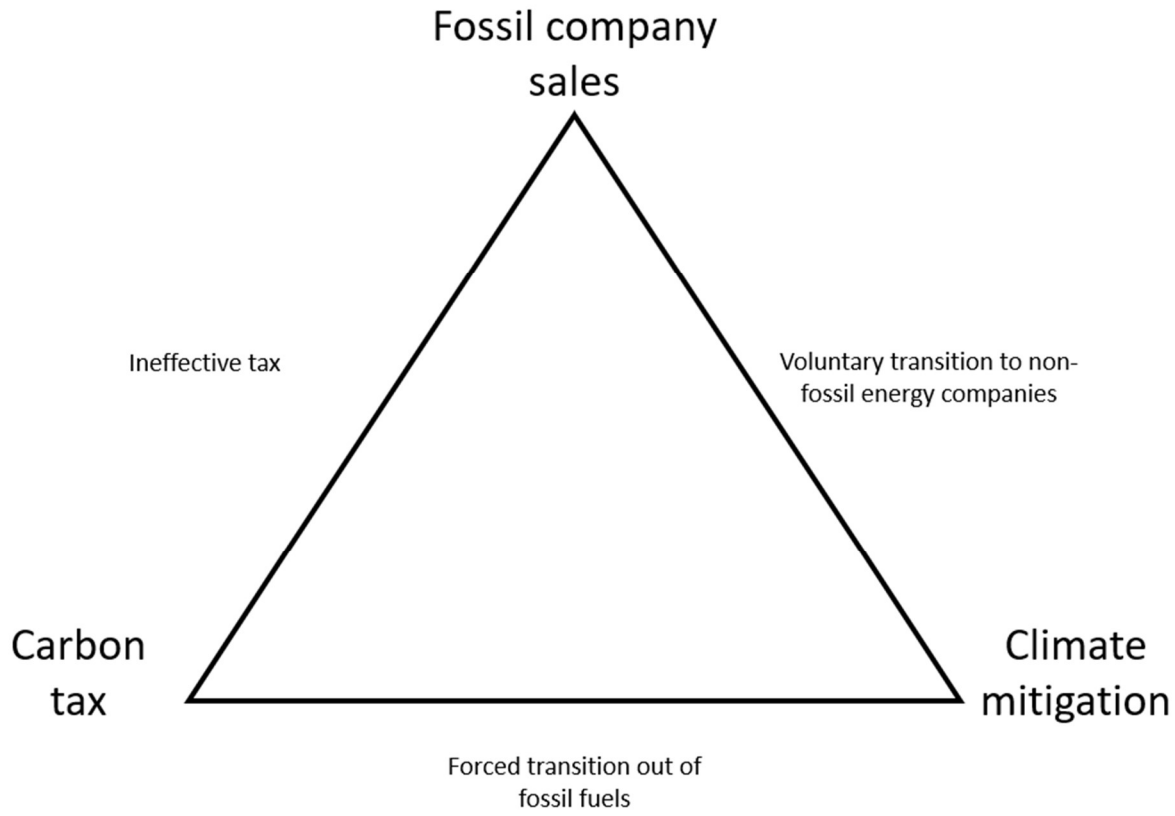
[3] Friedlingstein et al. (2022) and Our World in Data https://ourworldindata.org/emissions-by-fuel.

[4] Even if IPCC include some negative emissions, there is no current technology that allows for mass offsetting of emissions.

carbon tax, if the price of the oil they sell is expensive. Also, oil for other use (such as the creation of plastic or lubricants) could still generate profits. But what would have to stop is the sale of fossil fuel for combustion for a carbon tax to work.

Here I present a simplified framework that helps better understand the interaction between fossil fuel companies, regulators and climate change mitigation. As with all of these types of models, it is simplifying by essence. But it helps point out trade-offs in a clear manner. The idea is that you can only chose two out of the following three, but not all three: sales for fossil fuel companies, climate change mitigation and a carbon tax. Understand that fossil fuel companies by definition are companies that sell carbon generating fossil fuels (coal, gas or oil). These companies however can change and divest out of fossil fuel sales (but these companies then leave the framework of this trilemma and become energy companies or renewable energy companies).

Figure 1 – The trilemma of fossil fuel company transition



The key takeaway from this trilemma, is that an effective carbon tax would unlikely be supported by fossil fuel companies as they are today. In essence, the goal of a carbon tax is to reduce the burning of fossil fuel, the current core business of fossil fuel companies. An effective carbon tax would either force fossil fuel companies to transition, or reduce their sales close to zero. This would not likely be supported by private profit-making fossil fuel companies.

A carbon tax could also be implemented, but not reduce global emissions. While such a tax would be useful for government revenue, it would not help climate change mitigation. Such a tax could also receive the support of fossil fuel companies, but it would leave aside the question of climate change mitigation.

Finally, and this is the focus of recent literature, we could imagine climate change mitigation while fossil fuel companies still make a profit. This would include fossil fuel companies themselves changing to more sustainable energy production. This transition could come from fossil fuel companies themselves seeing an opportunity for future profit. For example, BP has recently acquired a 40.5% share in a large Australian renewable energy project.[5] Or this could come from shareholder engagement with these companies (Kölbel et al. 2020; van't Klooster and Naef 2022). In May 2021, ExxonMobil was forced by a small hedge fund to take on three more climate-focused directors on its board following a proxy battle. The proxy battle also made the ExxonMobil board promise a slightly more climate-friendly approach to their business (Naef 2022). Such a transition, whether forced by shareholder or coming from the company's management, would eventually make carbon taxes irrelevant to climate change mitigation. If the private sector offers enough decarbonated energy, carbon taxes would not be necessary.

The understanding among oil executive of the trilemma presented here is lacunary at best. Darren Woods, the CEO of ExxonMobil, promised shareholders the following: "We can increase supply [of oil] and reduce emissions."[6] While this is technically true when looking at the

[5] https://www.reuters.com/business/energy/bp-buys-into-australian-wind-solar-hydrogen-mega-project-2022-06-14/

[6] In the presentation to shareholders available here (time stamp 20:41) https://central.virtualshareholdermeeting.com/vsm/web?pvskey=XOM2022

emissions needed to extract oil (scope 1 and 2 emissions), it is not true of scope 3 emissions. For scope 3 emissions, if ExxonMobil increases supply, there will be more fossil fuel burned and more emissions.[7]

Chesapeake Energy seems to have a better grasp of the potential consequences of a carbon tax. In their report they wrote: "In addition, federal or state carbon taxes could directly increase our costs of operation and similarly incentivize consumers to shift away from fossil fuels."[8] Also more aware of these realities, Pioneer Natural Resources describes the potential effects of a carbon tax in its 2018 annual report:

"…the imposition of a carbon tax, any of which could have a material adverse effect on the Company's business, financial condition and results of operations. Moreover, such new legislation or regulatory programs as well as conservation plans and efforts undertaken in response to climate change could also materially and adversely affect demand for the oil, NGLs and gas the Company produces and lower the value of its reserves."[9]

Pioneer Natural Resources notes two adverse effects of a carbon tax, lower demand and a loss of value for its reserves. This implies less revenue and a loss of value of the balance sheet. This should be bad news. But Pioneer Natural Resources is among the minority of fossil fuel companies surveyed in this paper who seems to publicly acknowledge these issues.

Another candid view on carbon taxes comes from the "Monthly president report" of the Canadian company Peyto. The report comes "From the desk of Darren Gee, President & CEO". It gives an idea of the candid view of one fossil fuel company executive on carbon taxes:

"On December 11, 2020, the last day of parliament before the Christmas break, the Federal Liberal government announced a much more aggressive schedule to increase their highly controversial Carbon

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[7] The exception would be if all extration of oil is used for plastic production which does not directly increase CO2 emisisons as the burning of fossil fuel does.

[8] Chesapeake Energy annual report 2021, http://www.chk.com/Documents/investors/CHK_2021AnnualReport.pdf

[9] Note that the quote is cut and that it applies to a list of policies, « including a carbon tax ». Pioneer Natural Resources Annual Report 2018, available here https://www.pxd.com/sites/default/files/reports/PXD2018_AnnualReport_FINAL.pdf.

Tax up to $170/tonne by 2030. Needless to say this came as a dramatic shock to everyone, but particularily [sic] to Albertans and their primary industries."[10]

The tone in this report is clear. Carbon taxes are not welcome and could harm oil extraction. The letter continues to engage in the political economy of carbon taxes:

"While in the minds of many voters this Federal Carbon Tax may be disguised by some moral imperitive [sic] to save the planet, in the minds of Albertans (and those in Saskatchewan) it is simply another attempt to redistribute what little remaining wealth the West has. And it will drive the wedge separating Canada even deeper, further stoking the flames of Western separation."

This oil executive clearly has a negative view on carbon taxes. One specificity of Peyto, is that it has a large part of its activities in Canada and is affected by a local, not global, carbon tax (more on this level playing field argument in the discussion section). But despite this specificity, this candid view is in stark opposition with the communication at the largest oil and gas companies, which mostly favour carbon taxes. Larger companies are more in favour of carbon taxes as these companies have more visibility and perhaps also more professional management. This can contribute to more careful and well-informed positions on public issues like climate policy.

The carbon tax presented in the trilemma above has to be understood as a Chesapeake or Pioneer Natural Resources carbon tax, and not a carbon tax as imagined by the CEO of ExxonMobil. An effective carbon tax would indeed shift consumers away from fossil fuels, not increase supply of fossil fuels. It would mean lower value of fossil reserves and less revenues for fossil fuel companies. If these companies are seeking profits and shareholder value, they should really oppose carbon taxes. After presenting a survey of the share of support among oil and gas companies, we will try to understand the paradox of this support.

[10] The report is available here http://www.peyto.com/Files/PMReport/2021/PMR2021Jan4.pdf

3. Methodology

In this paper, I rely on the 100 largest oil and gas companies by reserves, as established by Carbon Underground 200.[11] The companies are classified by the potential scope 3 emissions of their reserves. So it is a measure of how much CO2 they would generate by burning all their reserves. These 100 companies are therefore the most important companies in the transition. They are mostly owned by governments and large investments managers (Dordi et al. 2022).

I then surveyed all available corporate communications to understand their official position on carbon taxes. First, I analyse all mentions of "carbon tax" on their corporate website. The methodology used included searching with the help of search engines for any claims of carbon taxes by oil and gas companies.

To get an exhaustive view of the mention of carbon taxes on their websites, I used the exact term search function of the Google search engine; I only search the root website of the fossil fuel company. So the search query for Shell would have been:

"carbon tax" site:shell.com

This displays all the pages within the company website using the exact term "carbon tax". When nothing is found, the search engine then also offers alternative search results for the same search keywords without the bracket. This then includes synonyms and related keywords. This comes with a set of limitations. First, some companies might not use this exact term but instead, carbon pricing. The focus in this article however is on a carbon tax, as this is what most economists argue for. Second, the methodology was done in English and this might have biased the search toward companies using English as the main language of their corporate website. English is the language of most global energy producers, except for Russian and Chinese companies (more on Russian companies in the appendix). Note that this methodology

[11] The work is based on the 100 gas and oil companies listed in the Carbon Underground 200 2019 company list. The companies that are no longer in business or merged are removed from the sample. The data covers 97% of proven fossil fuel reserves held by publicly-listed companies. For more on the database see https://www.ffisolutions.com/wp-content/uploads/2022/03/FFI-Solutions-Dec-2020.pdf

includes both the plural and singular of the phrase as well as carbon taxation ("carbon taxes" and "carbon taxation" are contained in the syntax of "carbon tax" and are counted as well).

Then, I systematically looked through the results for each oil and gas company until I found a recent and clear position on carbon taxes. Companies in favour of carbon taxes had an average of 55.3 pages mentioning the term "carbon tax". Companies against carbon taxes had an average of 15.3 pages with the mention and companies with no position had an average of 4.9 pages mentioning the term.

If I found no terms on the company websites, I looked for recent news items in the press or news websites. If nothing was found, the company was given an "N/A" status. The appendix presents the quotes I used for my analysis. The exercise contains a part of subjectivity. Subjectivity seems more marked for statements against carbon taxes that do not always clearly highlight the company's position.

Many of the results are reports from the CDP (formerly the Carbon Disclosure Project). The questionnaire sent by CDP asks directly whether the companies support a certain number of policies, including carbon taxes. Other results are interviews of executives, CSR or climate reports and other company documents.

Looking only at CDP data, I find that only 14 oil and gas companies have shared their position with CDP. Out of these 14 companies, 10 support carbon taxes (of which 5 with minor exceptions) and 2 are neutral. No companies who shared their position on carbon taxes with CDP are against them. This makes sense as there might be a selection bias, companies reporting to CDP are likely more in favour of climate measures. The approach taken here has the advantage to broaden the sample to all largest fossil fuel companies. This allows to also include companies which are against carbon taxes and have not shared this with CDP.

When it comes to the level of carbon taxes, we have little information. Companies in the sample mostly do not discuss the price of carbon taxes. A price that is too low could easily be borne by most companies. Total Energies and Inpex mention a price they use internally, giving a sense of what carbon price they could be considering. Total currently adds a price of carbon at \$30 to \$40 to its internal project pricing. Inpex uses \$35. Petyo E&D on the other hand,

opposed to carbon taxes, mentions a "highly controversial Carbon Tax up to $170/tonne by 2030", suggesting that this price would be too high for the company.

4. The 100 largest oil and gas companies' survey results

The results in Table 1 show that the largest share of oil and gas companies have no publicly available position on carbon taxes (or that such position was not easy to find, and hence probably not core to the company's public position). Most oil and gas companies have therefore stayed out of the debate. Oil and gas companies seem to agree and disagree with the policy in almost equal parts (23% in favour vs 19% against). When I add the size of the company to the equation, large companies tend to show more support on average (31%) than opposing a carbon tax (9%).

Let us remove the companies which do not have a position on the issue and only focus on the ones who do. Then the trade-off becomes even clearer. 78% of large companies with a position on the topic agree with carbon taxes (and only 22% disagree). Again, on the subgroup of smaller companies with a position, only 29% favour a carbon tax and 71% oppose it.

Table 1 – Public position of oil and gas companies on carbon taxes

	Overall 100 largest oil and gas companies	Top 50 largest oil and gas companies by reserves	Bottom 50 largest oil and gas companies by reserves
In favour of a carbon tax	23%	31%	13%
Unknown or no position	58%	60%	56%
Opposed to a carbon tax	19%	9%	31%

In summary, while most oil and gas companies have still not taken a position on carbon taxes, the majority of those who have taken a position agree with carbon taxes. For larger companies, the agreement rate is even higher on average.

The appendix offers descriptive statistics by countries. These need to be taken with a grain of salt as the number of companies is small. If we only focus on the three largest countries, some patterns emerge. Canada offers the highest degree of agreement with carbon taxes, at 40%. This is likely due to the fact that Canada already has a carbon tax in place and that these would benefit from a level playing field in other countries. In the US, disagreements are higher, with only 13% of American companies surveyed in favour of a tax (and 23% opposed). Finally, in Russia, no company has expressed any opinion on the topic. Table 2 in the appendix offers the full picture.

5. Discussion: Why do fossil fuel companies support carbon taxes?

As we have seen, oil and gas companies, and especially large ones support carbon taxes. Our trilemma conceptual model suggests that if these carbon taxes fulfil their purpose, fossil companies should not support these taxes. So why do they still support them?

Here I review different possible explanations for fossil fuel companies to support carbon taxes and illustrate them with their public communications. The potential explanations are non-exhaustive and not mutually exclusive. Some of the explanations are backed by what fossil fuel companies say, while others are based on the literature or evidence presented here.

1. Winners and losers: Stopping the competition from coal and other higher emitters

Many oil and gas companies deal only with oil and gas, not coal. This is the case of most major companies such as Chevron, BP, Shell or ExxonMobil. Only a few oil and gas companies operate in coal, such as BHP or Sasol, but often they are trying to reduce their coal operations and divest out of coal. Hopkins (2016) suggests that one of the reasons ExxonMobil could be

supporting a carbon tax is that it would help the shift from high-CO2-emitting coal, to oil and gas, which have lower emissions.

Table 3 in the appendix shows that only 12% of large coal companies (vs 31% for oil and gas companies) support a carbon tax. And 32% openly oppose a carbon tax (vs only 12% for oil and gas companies). Among coal companies supporter of carbon tax, many also have investments in either oil and gas or renewable energy production.

Coal is the largest source of energy generation according to the IEA. The IEA expects global coal consumption to increase by 1.58% from 2021 to 2024.[12] So coal is not only a competitor for oil and gas, but its use is also still growing. A carbon tax could shift that growth from coal to oil and gas.

If there was a global price on carbon, the price of coal would increase disproportionally to the price of oil and gas. The amount of CO2 emitted per unit of energy is two times higher for coal compared with natural gas, and around 1.5 times compared with oil.[13] Therefore, for oil and gas companies it is likely that a carbon tax would hit the competition before it reduces the demand for oil and gas. In the medium term, higher carbon prices could even mean more demand for oil and gas, as coal becomes prohibitively expensive.

Let us run a short simulation to look at the price effects of a carbon tax on coal compared to gas for electricity generation. Gas produces 201.96 kgCO2 per MWh, and sub-bituminous coal 345.96 kgCO2 per MWh.[14] Using these numbers, we can produce a potential carbon tax per MWh of electricity. Chevron expects future carbon prices to be between $55 and $250 per ton of CO2.[15] Using these data, a carbon tax would increase the coal price of $17-86 per MWh and

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[12] IEA, Coal 2021, Analaysis and forecast to 2024, IEA report, available here https://www.iea.org/reports/coal-2021 (see table on p.99 for forecast).

[13] US Energy Information Administration, Carbon Dioxide Emissions Coefficients, database, released October 5 2022.

[14] Data from Our World in Data, available here https://ourworldindata.org/grapher/carbon-dioxide-emissions-factor

[15] Chevron Climate Change Resilience Report, p. 32, available here https://www.chevron.com/-/media/chevron/sustainability/documents/climate-change-resilience-report-7-21.pdf

only $10-50 per MWh for gas. It becomes easy to see that if consumers have to choose between paying $86 or $50 for a MWh on top of the price of energy generation, they will turn to gas (oil is used less for energy generation). A larger carbon tax would therefore increase the demand for gas and reduce the demand for coal, all things being equal. If this is coupled with the belief that the demand for energy is inelastic (people will not stop using their laptop or heating their home, as explained in the next point), a carbon tax is in the interest of gas producers, but not coal producers.

Beyond shifting from coal to oil, a higher carbon tax would also make cleaner oil producers more competitive. Masnadi et al. (2018) show that there are different types of oil with more or less pollution. This lends support to the idea that Norwegian and Saudi companies (producing cleaner oil) would be more likely to support a carbon tax. And Canadian and American companies, with on average more polluting oil, would less likely favour a tax.

A carbon tax would also potentially make the demand for renewable energy higher. But as the history of energy evolution has shown, global energy usage has constantly grown even when new sources of energy were added (Smil 2022). Coal was never replaced by oil or gas or even renewable energy, and coal usage is still growing. A carbon tax would simply make a competitor disproportionately more expensive. And while energy needs are still growing, it would not reduce the amount of gas needed, it might even increase it.

There could also be a bet that while some parts of the world might stop relying on oil and gas in favour of renewables, others might simply reduce their footprint by shifting from coal to oil and gas. China and India currently heavily rely on coal. 70% of China's and 65% of India's energy came from coal in 2020.[16] They could shift part of their consumption to oil and gas, reducing each country's carbon footprint while leaving global oil and gas demand untouched. This is true only as far as the price of oil and gas including both transportation and carbon tax still makes it exportable from the place of extraction to the place of final use.

[16] Friedlingstein et al. (2022) and Our World in data https://ourworldindata.org/emissions-by-fuel.

All-in-all, there is an argument that cleaner producers are more likely to benefit from a carbon tax. This explains coal companies' reluctance to support carbon taxes while some oil and gas companies do. Similarly, larger oil and gas companies might have better extraction techniques and access to better resource grades oil, and therefore be more in favour.

2. Inelastic demand

The idea of inelastic demand is based on basic economic theory. The consumption of some goods is highly affected by their price. Other goods are completely inelastic to the price. Energy likely enters in the later category, at least for some part. Energy is part of necessity goods, they cannot be withheld. For example, domestic heating and water or agriculture need energy. This energy is unlikely, in the medium to long term, to be fully replaced by renewable energy (Smil 2022).

While it is a debated topic, there is some evidence that demand for oil is inelastic to price, at least in the short term (Dash, Sethi, and Bal 2018; Moore 2011). Hamilton (2009) suggests that oil demand in the short run may exhibit a relatively inelastic response to price changes. Consumers' habits and infrastructure limitations could contribute to this inelasticity. Cooper (2003) uses evidence from 23 countries to show that the demand for crude oil internationally is highly insensitive to changes in price. Krichene (2002) show that this high inelasticity held for the last century and helps explain the power of oil producers. But whether this evidence holds is independent from whether fossil fuel executives *believe* that the demand for oil is inelastic. And statements presented further down seem to go in that direction.

Therefore, oil and gas companies might be betting on the inelastic nature of global energy demand. Andrade de Sá and Daubanes (2016) have generated a model in which the inelastic price of oil makes a carbon tax ineffective. It is therefore not unreasonable to believe that carbon taxes could leave oil and gas prices untouched in the medium term.

Oil and gas companies have first-hand experience with these inelastic prices. Vermillion, a Canadian fossil fuel company, noted in a report that gas demand "proved to be inelastic at

high natural gas prices."[17] They noted this in 2021 following almost five-fold increases in natural gas prices in Europe. Engie, also looking at the recent energy crisis, note that "Given inelastic demand and no scope for switching to coal to produce electricity, volatility should remain high."[18] They also noticed that demand is unlikely to be affected by the price of oil.

With constantly growing global energy needs and no current viable large scale non-carbonated energy source, it is safe to assume that energy demand will remain inelastic to the price. That is to say that no matter the price, people will want to heat their homes and drive their cars. The idea is that industries and individuals might simply consume fewer other goods, but will never cut back on energy. And since oil and gas are among the widest available and most efficient energy types, it is unlikely that they will diminish. With such a view, carbon taxes are not likely to affect the demand for oil and gas (though it might for coal, as seen in the previous point). This could explain why fossil fuel companies do not see carbon taxes as a threat in the medium to long term.

3. Level playing field

A global carbon tax would create a level playing field for all fossil fuel companies. Currently, Canadian fossil fuel companies are subject to a carbon tax while American companies are not. This puts Canadian companies at a disadvantage (though they currently benefit from subsidies mitigating the effects of the tax). Carbon pricing further allows better than other instruments for clear policy comparison among countries, and in turn for policy harmonization (Weitzman 2015). An international carbon price is easier arranged than a set of global standards, though political coordination would still be needed.

How do oil and gas majors express these concerns? Chevron clearly states the level playing field in its position in favour of a carbon tax. The company wants to "Build up an integrated

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[17] Vermillion, Annual Report 2021, https://www.vermilionenergy.com/files/VEI_2021_Annual_Report.pdf

[18] Dashboard of energy transition 2021, available here https://www.engie.com/sites/default/files/assets/documents/2022-02/Energy_Transition_Dashboard_2021_Edition.pdf

global carbon market that creates a level playing field and mitigates trade distortions"[19] Repsol also stresses the issues of global competition an international carbon tax would solve:

"We favour setting a single carbon price across the whole world economy. However, we are aware that there is still no momentum to look forward to global carbon pricing and shared ambitions. That is why we welcome the European Commission initiative to explore proposals for mechanisms that would reduce the risk of carbon leakage as the EU increases its climate ambition in the European Green Deal context"[20]

The quote from Repsol is interesting as they not only support efforts for a global tax (which could be challenging as the next point shows), but also a Carbon Border Adjustment Mechanism as currently being tested by the EU. This would put oil and gas producers on equal footing no matter where they are based geographically.

The American Petroleum Institute (API), a major oil lobby, has similar arguments on a level playing field:

"Rather than a patchwork of federal and state regulations and mandates that could ineffectively address the climate challenge, an economywide government carbon price policy is the most impactful and transparent way to achieve meaningful progress.".[21]

The level playing field argument is one of the most common arguments given by oil and gas companies in favour of a carbon tax.

4. Belief that international coordination will fail or take time

In 2015, during the Paris Agreement meetings, oil executives sent a letter to the Executive Secretary of the UNFCCC and President of COP21 to support efforts to "introduce carbon pricing systems where they do not yet exist at the national or regional levels". They also tasked

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[19] Chervron, Climate Change Resilience report 2021, https://www.chevron.com/-/media/chevron/sustainability/documents/climate-change-resilience-report-7-21.pdf

[20] Repsol, 2021 Climate Change Report, available here https://index.repsol.com/content/dam/repsol-corporate/es/sostenibilidad/informes/2020/repsol-climate-change-2021.pdf

[21] https://www.api.org/climate#carbon-price, retrieved on 19 June 2022.

governments to "create an international framework that could eventually connect national systems".[22] This statement points to the main issue when it comes to a carbon tax. A carbon tax needs to be international and agreed upon by most nations, or it will lead to carbon leakage (Holladay, Mohsin, and Pradhan 2018; Fowlie and Reguant 2018). But the political economy of finding such a global agreement is complex at best.

International coordination on a global carbon tax will probably have to take into account the development level of the countries involved, with higher standards for more high income economies and more flexibility for middle and low income countries. The IMF currently has a proposal it is trying to implement using carbon floor prices that differ by country income level (Parry, Black, and Roaf 2021). This might be a step in the right direction to find a global consensus, but the proposal is far from being implemented.

To overcome international division, some countries could apply a unilateral carbon tax. The European Carbon Border Adjustment Mechanism (CBAM) is one attempt in that direction.[23] One country would tax the embedded carbon within imported goods. The idea is promising but it has yet to be implemented with the blessing of the World Trade Organization (WTO) (Trachtman 2017; Bellora and Fontagné 2022) and generate a consensus in global arenas such as the G20. China, a large exporter of high carbon goods, is unlikely to accept this tax on its exports. This needs international coordination, which is unlikely to happen, as G20 countries remain divided on the issue.

The current division among the international community could leave oil and gas companies several more decades to exploit their remaining reserves before a policy response limiting their production is effectively put in place. And this especially since economists have advocated carbon taxes as the optimal policy for over four decades now, starting with the Nobel Prize work by Nordhaus (1982; 2019). While international coordination is a major issue, there is

[22] The letter is available here www.total.com/sites/default/files/atoms/files/letter_to_christiana_figueres.pdf

[23] See https://www.consilium.europa.eu/en/press/press-releases/2022/03/15/carbon-border-adjustment-mechanism-cbam-council-agrees-its-negotiating-mandate/

more literature on the ineffectiveness of carbon taxes which might justify the attitude by fossil fuel companies (Cheng et al. 2021; Andrade de Sá and Daubanes 2016; Daubanes and Lasserre 2011; Douenne and Fabre 2020).

5. Removing uncertainty

Uncertainty is bad for business and can reduce investments (Bloom, Bond, and Van Reenen 2007; Baker, Bloom, and Davis 2016). Currently, oil and gas companies do not know if, when or where a carbon tax could be implemented globally. Knowing this would help plan investment with less risk. This uncertainty also has potential effect on financial stability of the economy (Semieniuk et al. 2021).

Santos and Oil Search, two companies in our dataset, perfectly reflect this issue of uncertainty in a large merger document available online:

"[…] market participants and commentators have a wide range of views regarding both future supply of and demand for oil, reflecting uncertainty regarding future technological and regulatory developments and the impact of global initiatives to reduce carbon emissions."[24]

The document clearly shows that uncertainty in regulatory developments can be an issue. The company Hess also stresses regulatory uncertainty issues in its CDP report, stating that "An emerging regulatory risk for Hess is the substantial regulatory uncertainty created by changing political dynamics."[25] Uncertainty makes running oil and gas companies difficult and hinders investment planning.

Another advantage of a carbon tax is that it removes financial uncertainty in accounting. It is a simple increase in the cost of doing business which can be calculated and forecasted. It reduces abatement cost and allows for a smoother transition. And even if a carbon tax was finally implemented, fossil fuel companies could be reassured by the fact that when implemented,

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[24] Santos and Oil Search merger document, p.42, available here https://www.santos.com/wp-content/uploads/2021/11/211111-Oil-Search-and-Santos-merger-update-Court-approves-distribution-of-Scheme-Booklet-and-convening-of-Scheme-Meeting.pdf.

[25] Hess, CDP Climate Change Questionnaire 2021, available here https://www.hess.com/docs/default-source/sustainability/hess-cdp-final.pdf

carbon taxes have been low. So these taxes have so far not represented an existential threat to fossil fuel companies.

Finally, there is uncertainty of the future development of technology. Fossil fuel companies might be betting on future carbon capture and storage technologies which would reduce their exposure to a carbon tax.

6. Shifting responsibility to the consumer and voter

A carbon tax could be a way for fossil fuel companies to shift their responsibility in climate change. By supporting a carbon tax, they support a realistic policy that could help climate change mitigation. As they are not active in the field of policy implementation, failure to implement that policy is out of their control. By supporting this policy that could potentially harm their own interest, they can show that they did everything they could to help mitigate climate change. The responsibility to enact this tax then lies with elected officials, voters, companies burning fossil fuels and consumers.

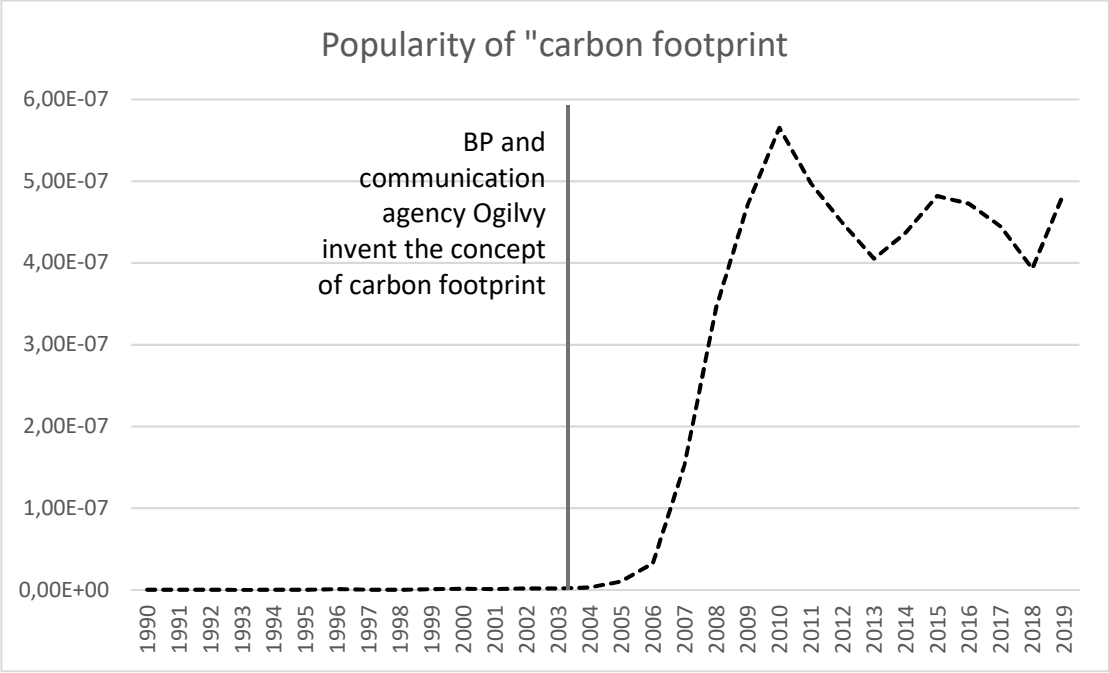
This is not a new strategy for fossil fuel companies. A 2005 campaign by BP did something similar. The main tagline of the campaign, which was created with communication agency Ogilvy, was "What is your carbon footprint?". The goal was to remind the consumers that they, and not fossil fuel companies, were burning fossil fuels when taking planes or their car. The point was to show that the consumer shared responsibility with the fossil fuel company. And that consumers should act on climate change, not fossil fuel companies that are mainly providing a product.

Before the BP campaign, the concept of carbon footprint was non-existent where it is now ubiquitous. Turner (2014) shows how BP invented the concept of "carbon footprint" with communication agency Ogilvy. The chart below follows Turner (2014) and shows the mention of "carbon footprint" as percentage of the words in most books published in English.

Taking a stance on carbon taxes implies a similar responsibility shifting mechanism than with the carbon footprint. Here, fossil fuel companies are supporting a viable political solution. They

have even put means to lobby congress in that direction in the US. They have launched the Political Action Committee (PAC) called Americans for Carbon Dividends (AFCD). The PAC is supported by the Climate Council Leadership which has many oil and gas companies as its founding organisational partners. They include BP, BHP, ConocoPhillips, TotalEnergies and Shell.[26] These companies fund lobbying in congress in favour of a carbon tax. The PAC received $1bn from the supporting companies and has suggested lobbying for a $40 carbon price meant to increase over time.[27] So it looks like fossil fuel companies are doing their best to put through a carbon tax.

The BP effect – What is your carbon footprint?



Data from Google Ngram, which counts the occurrence of the phrase "carbon footprint" in books. The chart essentially replicates the idea of Turner (2014) on the concept of carbon footprint.

[26] https://clcouncil.org/organizational-partners/

[27] https://www.reuters.com/article/idUSL2N22Y1EQ

But the responsibility is shifted from fossil fuel companies to the elected officials and voters. It is the voter who will have to bear the cost of the carbon tax. And the voter, as the evidence in the literature indicates (Douenne and Fabre 2022), might not want higher carbon taxes, and may vote out the politicians who suggest them. So essentially, the carbon tax is a tool that pushes the hard choices away from the fossil fuel company onto voters and elected officials. Just like the concept of the carbon footprint put the responsibility for emissions on the consumer, the carbon tax puts the cost on the citizen. All these choices prevent the fossil fuel companies from having to make changes themselves.

In that sense, their support for carbon taxes is more a public image management issue. This is in the spirit of Kenner and Heede (2021). They show evidence that fossil fuel companies have started to publicly communicate that they support emission reductions, while doing their best to sell as much fossil fuel as possible while they still can. Behind the Kenner and Heede (2021) evidence is also the idea that fossil fuel companies use communication as a public relations exercise. Taking a public stance in favour of carbon taxes does not engage fossil fuel companies in taking any action but offers them a better image to continue running their businesses.

A more clear way to communicate would be to set emissions targets. The Science Based Targets Initiative (SBTi) is developing guidance specifically for the oil and gas sector to set science-based targets aligned with the goals of the Paris Agreement. The Initiative had issued draft guidance for oil and gas companies in October 2020. But in March 2022, the SBTi paused target commitments and validations for fossil fuel companies. The methodology is still being developed, the SBTi published reports on the project's progress in 2023, including an expert advisory group review and draft resources for target setting methods in the oil and gas industry. But it remains that Oil and gas companies cannot yet report to SBTi.

More broadly, managers of oil companies are aware of the need for an energy transition and associated climate policy. They realise that resisting such policy harms their image. This does not mean that they fundamentally support it, but just that it is better than alternatives.

6. Conclusion

This paper has shown that the majority of large oil and gas companies favour the introduction of a carbon tax. Among the oil and gas companies that have spoken on the issue (among the 50 largest), 78% support a carbon tax. Among the whole sample of the 100 largest oil and gas companies, the majority have yet to take a position. The rest is equally split between support and opposition to carbon taxes.

Opposition is understandable. A tax will likely decrease the revenues of these firms and devalue reserves. These are negative outcomes for any for-profit shareholder-held company. The exact motivation of companies that support carbon taxes is far from clear. The theoretical framework presented clearly shows that unless fossil fuel companies decide to transition themselves, it will be either an effective tax (with losses for fossil fuel companies) or an ineffective tax but no climate change mitigation.

I offer some avenues for reflection and further research in the discussion part. It is likely that oil and gas companies think that a carbon tax will not impact their business in the medium to long term, while affecting the competition from coal in the shorter term. As the last 200 years of energy history show, renewables are unlikely to be a direct threat to oil and gas companies. Global demand for energy will still grow and demand tends to be relatively inelastic to the price, making fossil fuel companies optimistic of their prospects of future salesDash, Sethi, and Bal 2018; Moore 2011). Our future on this planet will depend on the extent to which this optimism is warranted.

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Appendix

Results by country

The sample counts 43 companies incorporated in the US, 16 in Canada, 7 in Russia and then three in Australia and Norway. The rest is split among different countries. Looking at the three largest countries shows that most support for carbon taxes can be found in Canada, followed by other countries and the US. Canadian companies are on average more likely to have disclosed their views on carbon taxes, maybe also because the country has a carbon tax in place. Russian companies do not have statements on their position on carbon tax (though part of this could be due to the fact that they communicate more in Russian than in English online).

Table 2 – Position on carbon tax by oil and gas company country of registration

	US	Canada	Russia	Others
In favour of a carbon tax	13%	40%	0%	29%
Unknown or no position	65%	33%	100%	55%
Opposed to a carbon tax	23%	27%	0%	16%
N	31	15	7	31

Detailed position by company

The table below shows the evidence taken to establish the percentages presented in the table in the paper. The work is based on the 100 gas and oil companies listed in the Carbon Underground 200 2019 company list.[28] The companies that are no longer in

[28] The list is available here upon request https://fossilfreefunds.org/carbon-underground-200.

business or merged are removed from the sample; this includes Noble Energy, Cabot Oil & Gas, Concho Resources, Apache, Encana, Seven Generations Energy, Cimarex Energy, Parsley Energy, WPX Energy, Painted Pony Energy, Sanchez Energy, JXTG Holdings, EP Energy, SRC Energy Inc, Roan Resources (Linn Energy) and Montage Resources Corporation.

The choices made here do contain some subjectivity. Presenting the full evidence in this table allows the reader to make up their mind on the statements chosen.

Review for coal companies

Doing the same exercise for the 50 largest coal companies using the same methodology as outlined yields the following results. While certain large coal companies support carbon taxes, their support is lower than for oil and gas companies.

Table 3 – Position on carbon taxes of the 50 largest oil and gas vs coal companies

	Top 50 largest coal companies by reserves	Top 50 largest oil and gas companies by reserves (same as Table 1 in the main body of the paper)
In favour of a carbon tax	12%	31%
Unknown or no position	56%	60%
Opposed to a carbon tax	32%	9%

Among the coal companies in favour of a carbon tax, many also operate in another mode of energy production. BHP and Sasol are also oil and gas companies which were already reviewed as supporting carbon taxes in the main exercise in this paper. RWE for example has a large renewable business and Vale also operates dams. Tech Resources and South32 seem to be the only two mostly coal companies that support a carbon tax.

Reading key: In Favour (F)/Opposed (O)/ Identified as a risk (R) / Unknown position or no information (N/A).

Both O and R are counted as a negative stance on carbon taxes.

Company	Position	Statement	Source of the quote	Website of source	Year
Saudi Aramco	N/A				
Gazprom	N/A				
Rosneft	N/A				
ExxonMobil	F	"We believe a price on carbon emissions is essential to achieving net zero emissions. Carbon pricing would send a clear signal through the market, creating incentives to reduce emissions, fostering investment in R&D to advance solutions and providing consumers with transparency to make the best choices."	CEO statement	https://corporate.exxonmobil.com/News/Newsroom/News-releases/Statements/Our-position-on-climate-policy-and-carbon-pricing	2021
PetroChina	N/A				

BP	F				
Lukoil	N/A				
Novatek	N/A				
Chevron	F	"We support a carbon price."	Report "climate change resilience, advancing a lower-carbon future"	https://www.chevron.com/-/media/chevron/sustainability/documents/climate-change-resilience-report-7-21.pdf	2021
Total	F	**"By advocating carbon pricing**: Total includes a carbon price of $30 to $40 per ton in its project costs, is a member of the World Bank's Carbon Pricing Leadership Coalition and has joined the Climate Leadership Council's initiative to introduce a carbon tax in the United States."	Company website	https://totalenergies.com/media/news/press-releases/Total-Pledges-to-Offset-Carbon-Emissions-From-All-Company-Plane-Travel	2021
Royal Dutch Shell	F				2015

Gazprom Neft	N/A				
Petrobras	N/A				
Tatneft	N/A				
ENI	F	"Industrialised western countries should introduce a carbon tax as a key way to curb CO2 emissions more efficiently than existing cap-and-trade systems, Italian oil and gas major Eni's ENI.MI chief executive said on Tuesday."	CEO statement	https://www.reuters.com/article/eni-carbontax-idINLM35468120090922	2009
ONGC	N/A				
Equinor ASA (Statoil ASA)	F	"Statoil has for some years called for a price on carbon because we know that carbon pricing actually works. If more governments put a price on carbon, other businesses will follow suit and quickly." Eldar Sætre, President and CEO of Statoil.	CEO statement	https://blogs.worldbank.org/climatechange/statoil-ceo-we-know-carbon-pricing-actually-works	2015
ConocoPhillips	F	"The most effective tool to reduce greenhouse gases across the economy is a well-designed price on carbon emissions."	Company website	https://www.conocophillips.com/sustainability/managing-climate-related-risks/public-policy/carbon-pricing/	2022
CNOOC	N/A				

Canadian Natural Resources	F	In the CDP report, under the corporate position regarding a carbon tax, it reads "Support with minor exceptions"	CDP report	https://www.cnrl.com/CDP-Climate	2021
Inpex	F	"We are applying an internal carbon price (US$35/t CO2-e) as part of the economic assessment of existing and potential future projects."	Sustainability report		
EQT	N/A				
EOG Resources	N/A				
Sinopec	N/A				
Occidental / Oxy	F	"We believe that while a variety of policies can enable emission reductions, a market-based mechanism with a baseline regulatory framework is the optimal way to achieve reductions."	Company website	https://www.oxy.com/globalassets/documents/publications/oxy-climate-policy-positions.pdf	2021
Bashneft	N/A				
Range Resources	N/A				
Antero Resources	N/A				

Repsol	F	"We favour setting a single carbon price across the whole world economy. However, we are aware that there is still no momentum to look forward to global carbon pricing and shared ambitions. That is why we welcome the European Commission initiative to explore proposals for mechanisms that would reduce the risk of carbon leakage as the EU increases its climate ambition in the European Green Deal context, and at the same time it is preserved and not deteriorated the EU based industry competitiveness while other world regions arrive to similar EU environmental standards, moment in which such mechanism should vanish."	CDP report	https://index.repsol.com/content/dam/repsol-corporate/es/sostenibilidad/informes/2020/repsol-climate-change-2021.pdf	2021
Suncor Energy	F	"We think a broad-based carbon price is the right answer."	CEO statement	https://www.cbc.ca/news/business/big-oil-to-rachel-notley-bring-on-a-carbon-tax-1.3084357	2015
Ecopetrol	N/A				
Cenovus Energy	N/A				
Southwestern Energy	N/A				

Imperial Oil	F	"First I just want to highlight that Imperial supports an economy-wide carbon tax and has long operated in jurisdictions with carbon pricing."	CEO statement	https://www.imperialoil.ca/-/media/Imperial/Files/Investor/Speeches-and-presentations/2021_q1_imperial_earnings_call_transcript.pdf?la=en-CA&hash=55F1C79748364B0AEB5AEB2A990DB6A2151C11EE	2021
Devon Energy	N/A				
Continental Resources	N/A				
Diamondback Energy	O	CDP questionnaire question: Are any of your operations or activities regulated by a carbon pricing system (i.e. ETS, Cap & Trade or Carbon Tax)? Company answer:"No, and we do not anticipate being regulated in the next three years"		https://ir.diamondbackenergy.com/static-files/56116f55-f40c-4e89-a158-f4da0a49ac60	
Chesapeake Energy	R	"In addition, federal or state carbon taxes could directly increase our costs of operation and similarly incentivize consumers to shift away from fossil fuels."		http://www.chk.com/Documents/investors/CHK_2021AnnualReport.pdf	2021

Marathon Oil	N/A				
OMV	N/A				
Hess	N/A				
CNX Resources	R	"INDUSTRY RISKS" "Carbon tax and demand destruction via government policy"		https://www.cnx.com/cnx/media/Pdf/CNX_2020CRR.pdf	
YPF	N/A				
Pioneer Natural Resources	R	The adoption and implementation of any federal or state legislation or regulations or international agreements that require reporting of GHGs or otherwise restrict emissions of GHGs from the Company's equipment and operations could require the Company to incur increased capital and operating costs, such as costs to purchase and operate emissions control systems, acquire emissions allowances or comply with new regulatory or reporting requirements, **including the imposition of a carbon tax, any of which could have a material adverse effect on the Company's business, financial condition and results of operations.** Moreover, such new legislation or regulatory programs as well as conservation plans and efforts undertaken in response to climate change **could also materially and adversely affect demand for the oil, NGLs and gas the Company produces and lower the**		https://www.pxd.com/sites/default/files/reports/PXD2018_AnnualReport_FINAL.pdf	2018

		value of its reserves. Depending on the severity of any such limitations, the effect on the value of the Company's reserves could be material. Non-governmental activism directed at shifting funding away from companies with energy-related assets could result in limitations or restrictions on certain sources of funding for the energy sector.			
Tourmaline Oil	N/A				
Murphy Oil	N/A				
BHP	F	"We believe an effective policy framework should include a complementary set of measures, including a globally consistent price on carbon, support for low emissions technology and negative emissions technologies and energy efficiency, and measures to build resilience. We are a signatory to the World Bank's 'Putting a Price on Carbon' statement and a partner in the Carbon Pricing Leadership Coalition, a global initiative that brings together leaders from industry, government, academia and civil society with the goal of putting in place effective carbon	CDP report	https://www.bhp.com/-/media/documents/environment/2020/200928_bhpcdpresponseclimatechange2020.pdf	2020

		pricing policies. We believe carbon pricing should be implemented in a way that addresses competitiveness concerns and achieves lowest cost emissions reductions. We believe that to be effective and efficient, a carbon price should be (i) clear – the objectives and principles should be clearly defined and consistently applied; (ii) predictable – effective planning and investment requires certainty on the parameters, timelines and long term trajectory of policy; and (iii) measured – a measured transition requires a gradual approach in which there is time for preparation and adjustment."			
Husky Energy	F	"Husky supports efforts to price carbon in a way that is equitable for all GHG emitters and preserves industry competitiveness."	CDP report	https://huskyenergy.com/downloads/abouthusky/cdpreports/Climate_Change_2018_Information_Request_Husky_Energy_Inc.pdf	2018
Aker BP	N/A	no position on carbon taxes in CDP report	CDP report	https://akerbp.com/wp-content/uploads/2021/07/aker-bp-asa-cdp-climate-change-questionnaire-2021-20210705101720.pdf	2021

Woodside Petroleum	N/A				
California Resources	N/A				
SK Innovation	N/A				
Gulfport Energy	R	"In addition, federal or state carbon taxes could directly increase our costs of operation and similarly incentivize consumers to shift away from fossil fuels."	SEC report	https://www.gulfportenergy.com/investors/sec-filings/all-sec-filings/content/0001628280-21-004026/0001628280-21-004026.pdf	2020
PTT	N/A				
QEP Resources	N/A				
Sasol	O	"To ensure that South Africa's transition is orderly and just, developed policy needs to be clear and cohesive. While Sasol supports a transition to a lower-carbon economy **we remain concerned that the carbon tax will further diminish the country's investment attractiveness and competitiveness** ."	CDP report	https://www.sasol.com/sites/default/files/financial_reports/Sasol_Limited_CDP_Climate_Change_Questionnaire_2019_25%20Oct%2019.pdf	2019

Crescent Point Energy	N/A				
Birchcliff Energy	N/A				
Whiting Petroleum	N/A				
PDC Energy	N/A				
SM Energy	N/A				
Santos	R	"Carbon pricing policies, including a carbon tax, emissions trading scheme, or any other regulatory carbon pricing mechanism may increase operating costs or impact the international competitiveness of Santos projects."	Climate change report	https://www.santos.com/wp-content/uploads/2021/02/2021-Climate-Change-Report.pdf	2021
Lundin	N/A				
National Fuel Gas	R	"Evolving federal, state, and local statutory and/or regulatory approaches could negatively impact the Company's ability to grow or maintain its operations and assets. Potential developments could include regional or statewide moratorium(s) on natural gas; increased restrictions on certain operating	Corporate Respons	https://www.nationalfuel.com/wp-content/uploads/documents/NFG-2020-CR-Report-Final.pdf	2020

		practices; and cap-and-trade, severance tax and/or carbon tax implementation."	ibility report		
Oil India	N/A				
Mitsui	R	"As transition risks related to policy and legal risks, the introduction of government-imposed greenhouse gas emissions restrictions including imposition of carbon tax, and cap-and-trade schemes of emissions credit could adversely affect the operating results of our businesses that use fossil fuels and emit large amount of greenhouse gases, such as overseas power producing businesses, and that produce coal, oil and gas, where we have minority share holdings"	Integrated report 2018	https://www.mitsui.com/jp/en/ir/library/report/___icsFiles/afieldfile/2018/09/10/en_ar2018_all.pdf	2018
Ultra Petroleum / Pure West	N/A				
ARC Resources	F	"ARC holds the position that federal and provincial carbon taxes and emission regulations must be implemented in a way that ensures reductions are meaningful, measurable, and cost effective while maintaining the competitiveness of the Canadian energy sector."	ESG report	https://www.arcresources.com/assets/pdf/ARC-Resources-Ltd.-2020-ESG-Report.pdf	2020

MEG Energy	F	under "Carbon tax" in the CDP report, they chose "Support with minor exceptions"	CDP report	https://www.megenergy.com/sites/default/files/MEG%20Energy%20CDP%20Climate%20Change%20Questionnaire%202021.pdf	2021
Galp Energia	N/A				
Polish Oil & Gas	N/A				
Peyto E&D	O	"On December 11, 2020, the last day of parliament before the Christmas break, the Federal Liberal government announced a much more aggressive schedule to increase their highly controversial Carbon Tax up to $170/tonne by 2030. Needless to say this came as a dramatic shock to everyone, but particularily to Albertans and their primary industries."	Monthly president report	http://www.peyto.com/Files/PMReport/2021/PMR2021Jan4.pdf	2021
Comstock Resources	N/A				
Extraction Oil & Gas	N/A				
Oasis Petroleum	N/A				

Whitecap Resources	O	"Further, the imposition of carbon taxes puts us at a disadvantage with our counterparts who operate in jurisdictions where there are less costly carbon regulations."	Corporate report	https://www.wcap.ca/download_file/376/0	2021
Oil Search	R	"Costs associated with production of oil and gas if a carbon tax is implemented impacting on cost per barrel of oil equivalent (BOE). Costs associated with compliance."	CDP report	https://www.oilsearch.com/___data/assets/pdf_file/0016/6046/OSL_-ProgrammeResponseClimate-Change-2016-Final_CConly.pdf	2021
ENGIE	F	"Carbon prices remain overall too low and too limited to allow a drastic reduction in GHG emissions, however."	Dashboard of energy transition	https://www.engie.com/sites/default/files/assets/documents/2022-02/Energy_Transition_Dashboard_2021_Edition.pdf	2021
Paramount Resources	O	"Further, the imposition of carbon taxes could put the Company at a disadvantage with competitors operating in jurisdictions where there are less costly or no such carbon regulations."	Corporate report	https://www.paramountres.com/content/uploads/2021/09/2018-Annual-Information-Form.pdf	2018
Denbury Resources	R	"Enactment of legislative or regulatory proposals under consideration could negatively affect our business. Numerous legislative and regulatory proposals affecting the oil and gas industry have been introduced, are anticipated to be introduced, or are otherwise under consideration, by Congress and various	Corporate report	https://www.denbury.com/files/doc_financials/2013/Denbury_Final_040814.pdf	2013

		federal agencies. Among these proposals are: (1) climate change/carbon tax legislation introduced in Congress"			
DNO International	R	"The price on carbon emissions in Norway is among the highest in the world, in 2019 it was about USD 70-80/ tonne CO2. An increase in the allowance price will make DNO's operations more expensive."	CDP report	https://www.dno.no/media/ndkidpt0/final-cdp-ghg-dno-submission-august-2020.pdf	2020
Vermilion Energy Inc	R	"Increases in carbon taxes would result in a decreased netback." "An example of a risk case (Section 2.3, Risk 1) that is impacting Vermilion is the economy wide carbon tax in our operations in Alberta, Canada. Current financial impacts associated with this (based on 2018 activity) was approximately $1.18MM."	CDP report	http://sustainability.vermilionenergy.com/files/pdf/CDP%20Climate%20Submission%20August%202020%20-%20Full.pdf	2020
SEPLAT Petroleum	N/A				
Centennial Resource Development Inc	N/A				