

# Does Public Concern Affect the Greenhouse Gas Emissions of Oil and Gas Production, Through Logistics?

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**Abstract**— Today's globalised world is well aware that the logistics in fossil fuel industry enables it to be the main contributor to greenhouse gas (GHG) emissions that cause global warming and climate change. Negative public opinion about the oil and gas industry is rising globally. A growing number of societies are proficient at varying public opinion about oil and gas industry emissions. In this context, oil and gas companies have begun to substantially invest in renewable energy sources in a bid to diversify their oil and gas product portfolios to mitigate climate change risks. This energy transition is influenced by rising social concern about climate change. Energy transition is an environmental management system and its outcomes benefit dry zone agriculture and many other business sectors. In this research work, we used qualitative data obtained from real social surveys conducted by Yale University and Pew Research Center from 2013 to 2019 and the emissions data disclosed by oil and gas companies for the same time period, and we use Excel spreadsheets to give graphic and numeric outputs in a time-series analysis. The outcome of the analysis tells us the relationship between the social concern about climate change and emissions reduction and the environmental performance of oil and gas companies. Our analysis shows that public concern about climate change is always high in Europe compared to the United States, but it has been increasing steadily on both continents, in Europe from 54% in 2015 to 79% in 2019 and in the United States from 40% in 2013 to 69% in 2019. Our graphical analysis reveals social concern has had a real impact on climate change, leading to a reduction of over ten million tons of emissions annually in 2013–2019 on both sides of the Atlantic, while meeting growing energy demand particularly in the United States.

**Keywords**— *Climate change, Energy transition, Environmental management system, Environmental performance, Renewable energy, Social concern*

## 1.0 Introduction

Few studies address the risks of climate change and fossil fuel industry emissions in relation to the magnitude of social concern on climate change. This paper aims to identify and describe how social concern arising from climate change issues affects the fossil fuel industry through the support of its logistics and to what extent it stems fossil fuel industry emissions. Energy is the prime enabler of nearly all of the world's economic sectors [7]. The agricultural economy is at the heart of it. Improvements in human health and welfare have coincided with greater economic prosperity achieved through intensive use of energy, primarily the logistics in fossil fuels such as coal, oil and gas, as described by ref [17]. Petroleum is integrated into modern economies, playing a key role in business and society [15]. Irrespective of these great benefits, the logistics in fossil fuel sector accounts for two-third of GHG emissions [9]. Energy transition is one of the solutions being applied across the energy sector to mitigate climate change risks [6]-[9]. Therefore, energy transition plays a key role in nearly all economic sectors to create cleaner industry. Currently the oil and gas sector is under growing pressure to change its business practices in an effort to halt global warming. Increasing social pressure is leading governments to impose stringent policies to limit emissions and aim for better environmental performance by the industry. Social concern on climate change has increased with the expansion of social media platforms [20]. It has been instrumental in driving social sentiment around the world, affecting business interests, shaping public discourse, and influencing government policy on global warming and climate change [1]-[3]. Without mass public consensus about climate change, it is highly unlikely that the sector would reduce its own emissions [10].

Considering these issues, this article asks a question: Does social concern affect the greenhouse gas emissions of oil and gas companies and improve the environmental performance of the industry? Public concern led world leaders to sign the Paris Climate Change Agreement in 2015 to limit emissions, which justifies the relevance of this research, specifically public concern and its effect on climate change, as demonstrated by Dosemagen (2017) [5]. Overall, our results confirm Dosemagen claim.

## 2.0 Method and Materials

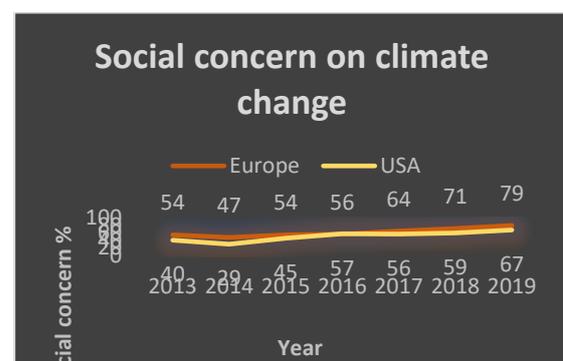
Energy transition is a strategic activity and its social and technical aspects are extremely complex and difficult to quantify and analyse. For the analysis of complex outcomes, a qualitative approach is more suitable [4]-[18]. Gaya and Smith (2016) demonstrated that the qualitative method is a more practical approach in the realm of strategic management disciplines, while Merriam (2016) and Thomas (2011) suggest this method has the power to eliminate the institutional bias reflected in quantitative methods [8]-[13]-[16]. Therefore, the qualitative research method is a more practical approach to describing the subjective meaning of social concern issues and sketching a broad picture and holistic account [20]. Data on social concern about climate change has been taken from Yale University and Pew Center research from 2013 to 2019 and GHG emissions data were obtained from BP's annual reports during the same period [2]-[11]-[14]. Data were analysed by using Excel spreadsheets to give graphic and numeric outputs for a time-series analysis. The social concern data were from over 84,000 survey respondents in 76 polls obtained from Yale and Pew research. In this research we considered whether the serious public concern about climate change in both Europe and the USA between 2013 and 2019 could predict emissions reductions and enable us to identify the effect of social concern on climate change with a new level of robustness. An extended time period provides sufficient interpretation power to detect minor variations in social concern about climate change [19]. Our studies have examined the effect of public concern on climate change over a longer timescale with a larger sample from Yale and Pew research, with greater consistency. Using a qualitative research approach, the current study contributes to knowledge about social concern as an

essential part of the energy transition process of product diversification.

## 3.0 Results

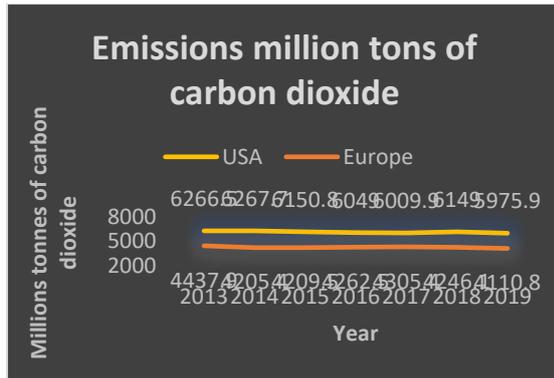
Figure 1a shows trends in social concern and Figure 1b below shows greenhouse gas emissions in Europe and United States. Trends are based on individual surveys about climate change concern. Public concern about climate change reached 54% in 2015 in Europe, remained low till 2016, then steadily increased until 2019. In the USA, social concern steadily increased to 57% in 2016, then fell by 1 point in 2017 and rebounded again between 2017 and 2019 to 67%. In the USA, there was a 11point increase from 2017 to 2019, while in Europe there was a 15-point increase, which shows Europe's social concern about climate change is almost always higher than the United States'.

Overall, Figure 1b shows the greenhouse gas emissions in the US are higher than in Europe during the same time period. In Europe, GHG emissions have reduced steadily from 4437.9 million tons in 2013 to 4110.80 million tons in 2019, while the United States has progressed slowly too, reducing its emissions from 6266.50 million tons in 2013 to 5975.90 million tons in 2019. Total emissions reduction was 10,896.7 million tons in 2019 for both continents, but at all times Europe's emissions were lower than the United States'. Figure 1a shows that the trend in social concern clearly reflects the trend in GHG emissions reduction on both sides of the Atlantic.



**Figure 1a. Trends in social concern about climate change and greenhouse gas emissions in Europe and the United States**

**Source:** Pew Research 2013-2019



**Figure 1b. Emissions in Europe and the United States (2013-2019)**

Source: BP 2020

#### 4.0 Discussion and Conclusion

In this research work, we examined the relationship between climate change, in terms of GHG emissions, and social concern, using comprehensive public survey data from independent research bodies and industry publications. These two streams of data enable us to identify the relationship between social concern and the environmental performance of the fossil fuel sector. The reduction of GHG emissions constitutes a proxy indicator for environmental performance and the social processes that drive it.

The underlying argument is that the effect of social concern on climate change is a proxy indicator of serious public concern about the harmful effect of emissions, mainly from burning fossil fuel, which can be used to make an informed prediction of future trends in emissions. Thereby industry can consider adding a wider spectrum of renewable energy sources to their energy mix, reducing its emissions while anticipating social clean energy demand. Results showed this transition was propelled by strong social concern. Serious social concern about climate change could increase the scrutiny of oil and gas sector emissions in turn that leads to stringent government policies resulting in better environmental performance of the sector, which answers our research question. In both Europe and the USA, the results lead us to guess that social concerns are much more an issue where climate change is concerned. Our time series analysis shows that lower levels of emissions are possibly related to a higher level of public concern over climate change. The results suggest that social concern could be a strong predictor of the acceptance of renewable energy sources in the oil and gas industry energy mix. This association is large and implies a strong relationship between social concern on climate change and GHG emissions. Time series analysis reveals that social concern about climate change influences reduction of GHG and consequently the environmental performance of the industry. The high social concern trend decreased from 2013 to 2014 as focus shifted to global economic recession, but social concern has had a significant effect on greenhouse gas emissions. Figures 1a and 1b explain the early research by McCright and Dunlop (2011), showing that the relationship between social concern on climate change has increased over the last two

decades [12]. Our results show that overall Europe has become more socially concerned, whereas the United States has tended to become more skeptical about the existence of climate change.

In conclusion, we found that the literature about the effect of social concern on GHG emissions in the oil and gas sector is limited. To fill this gap, we presented the estimates of trends of social concern about climate change in Europe and the United States in a qualitative interpretivist paradigm [19]. These estimates enable us to assess the relationship between social concern and environmental performance with a new level of rigour. Researching these relationships also opens new windows of opportunity for robust research into the causes and consequences of social concern about climate change by way of the GHG emissions of the oil and gas sector. Despite these important insights, our study has several limitations, mainly that when we explored the effect on environmental performance of the oil and gas sector, we only used the level of social concern on both continents and the oil and gas sector's environmental performance to represent adding renewable energy sources to its energy mix and reducing its GHG emissions. The cost and complexity of larger oilfields and the easy availability of low-cost solar panel and wind turbine technology are also influencing the industry to consider energy transition. This is not explored in this paper, but it is fertile ground which we will present in future research work.

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