# THE SPARK OF SUSTAINABILITY: ANALYZING THE ENERGY MARKET'S RESPONSE TO CLIMATE DISCLOSURE FRAMEWORKS

by

MICHAEL YOO

A THESIS

Presented to the Department of Environmental Studies
and the Robert D. Clark Honors College
in partial fulfillment of the requirements for the degree of
Bachelor of Science

June 2023

## An Abstract of the Thesis of

Michael Yoo for the degree of Bachelor of Science
in the Department of Environmental Studies to be taken June 2023

Title: The Spark of Sustainability: Analyzing the Energy Market's Response to Climate Disclosure Frameworks

Approved: *Joshua Skov, Ph.D.*
Primary Thesis Advisor

This study investigates current climate disclosure practices within the U.S. oil and gas (O&G) industry by analyzing the annual sustainability reports published by nine publicly listed companies in the industry. By centering on the four thematic areas of environmental, social, and corporate governance (ESG) performance outlined by a leading climate disclosure framework, the Task Force on Climate-related Financial Disclosures, this research will evaluate the O&G industry's exposure to ESG-related risks and opportunities. By analyzing existing global climate disclosure frameworks, and contextualizing it with the disclosure proposals posed by the United States Securities Exchange Commission, this study highlights the urgent need for standardization in ESG reporting within the industry and points to future research opportunities in analyzing regulatory changes in climate disclosure.

## Table of Contents


Introduction 1
Research Design 3
Background 5
Voluntary Climate Disclosure 5
Global Reporting Initiative (GRI) 6
Task Force for Climate Related Financial Disclosures (TCFD) 7
Sustainability Accounting Standards Board (SASB) 8
Sustainability Accounting Standards Board (SASB) 8
United Nations Sustainable Development Goals (SDGs) and Global Compact 10
International Petroleum Industry Environmental Conservation Association (IPIECA) 11
Standardization Among Voluntary Climate Disclosure Frameworks 13
Securities and Exchange Commission (SEC) Climate Disclosure Efforts 14
Analysis 17
TCFD Pillars One and Two: Governance and Risk Management 17
TCFD Pillar Three: Strategy 18
TCFD Pillar Four: Metrics and Targets 19
Discussion 20
Conclusion 23
Appendix 25
Bibliography 27

# List of Figures

Figure 1: Comparison of ESG Information Published by Select O&G Companies 25

## Introduction

The current economic climate is marked by global pressure for decisive climate action. In the face of escalating environmental challenges and growing public consciousness, companies are setting ambitious climate goals and creating roadmaps to reduce their environmental impact. Governments, international organizations, consumers, and investors alike are pushing the shift towards greener business practices, particularly in high-carbon industries like oil and gas. Given the pivotal role of these industries in global emissions, the transition towards sustainable operations is not only a corporate responsibility but a broader economic imperative.

Climate disclosures are a critical component for companies looking to be more ambitious and transparent with their environmental initiatives. Climate disclosures refers to the process in which a company publicly reports their exposure to environmental risks and opportunities. In this process, companies disclose its climate-related operational activities, such as its greenhouse gas (GHG) emissions and energy usage, as well as its climate-related vulnerabilities using methods such as climate scenario analysis. Companies often publish their climate disclosures through an annual report, benchmarking its environmental performance against similar firms to realign its long-term strategy and providing stakeholders a quantifiable understanding of their environmental performance. In this way, these disclosures foster corporate accountability and encourage companies to constantly innovate to improve their environmental performance.

These disclosures also hold significant implications for strategic corporate decision-making. The data derived from these disclosures can inform companies' environmental strategies, guiding the development of effective sustainability initiatives and climate risk mitigation plans. By facilitating data-driven decision-making, these disclosures can enhance a company's adaptability and resilience in the face of climate change. Simultaneously, companies

are able to demonstrate their commitment to sustainability, which can strengthen their reputation and enhance stakeholder trust.

In recent years, the evolution of climate disclosures has also been shaped by regulatory advancements. Countries globally are recognizing the importance of corporate transparency in their climate action efforts and are strengthening regulations requiring companies to disclose their climate-related strategies. The European Union (EU) has been at the forefront of regulatory advancements in this area. The EU's Sustainable Finance Disclosure Regulation (SFDR) mandates financial market participants and companies to provide consistent and standardized information on the environmental and social impacts of their investments and activities. This regulation aims to enhance transparency, promote sustainable investments, and align financial flows with the goals of the Paris Agreement. As a result, organizations operating within the EU are adapting their climate disclosures to comply with the SFDR, providing more comprehensive and comparable information to investors and stakeholders.

**Research Design**

This study will investigate the current state of climate disclosure within the domestic oil and gas (O&G) industry with the overarching goal of illuminating how major players within the industry communicate information on their ESG performance.

The research method adopted for this thesis borrows heavily from that used in a research study conducted by the Columbia Center on Global Energy Policy. The corresponding research paper, titled "Environmental, Social, and Governance (ESG) Performance of US Upstream Oil & Gas Companies," evaluates how 15 U.S. O&G companies perform GHG emissions management and assess their climate-related risks. In terms of methodology, the referenced paper performs a comprehensive audit of the annual sustainability reports shared by each of the 15 companies and captures data on their ESG performance. This thesis will utilize a similar methodology, surveying the annual sustainability reports shared by nine domestic O&G companies in 2022 to better understand the industry's approach to climate disclosure.

This study will analyze three types of O&G companies: upstream, midstream, and downstream. Each of these company types, given their distinct operations, focus on a different dimension of ESG in their climate disclosure efforts. Upstream companies explore new oil and natural gas reserves with the goal of bringing them into production. Apart from reporting their GHG emissions, upstream companies often disclose their engagement with community stakeholders as evidence of their dedication to addressing potential social rights issues linked to their operations. Midstream companies, meanwhile, bridge the gap between the extraction and sale of O&G by handling the transportation, storage, and wholesale marketing of petroleum products. Health and safety (H&S) is a significant reporting category for companies in this segment, who emphasize their investments in pipeline integrity, infrastructure safety, and

emergency response capabilities to underline the safety and efficiency of their operations. Downstream companies are positioned at the end of the chain, refining and processing O&G products before marketing and distributing them as finished products to consumers. By covering all three segments, this study aims to capture the full breadth of climate disclosure practices across the industry.

While each of these segments feature a host of independent companies, many major O&G entities are integrated, meaning that they conduct business across upstream, midstream, and downstream operations. These companies can either be privately owned, publicly listed, or state-owned, which significantly influences the amount of publicly available information. Given the accessibility of information and the transparency associated with public accountability, this study will analyze the climate disclosures of nine, publicly listed O&G companies, many of which conduct business across all three operational segments.

Similar to the referenced research study, I will use the Task Force on Climate-related Financial Disclosures (TCFD) categories to guide my evaluation of the presence and type of information disclosed in each company's sustainability report. Using the qualitative data from this evaluation, I will then construct a table capturing the most critical climate disclosures. This table, which will be available in the appendix, will serve as a key reference for evaluating the industry's current disclosure practices in GHG management and climate-related risks.

## Background

### *Voluntary Climate Disclosure*

Voluntary climate disclosures play a vital role in the way companies communicate their ESG performance. As the term suggests, these disclosures are non-mandatory declarations companies opt to make to reveal their exposure and strategy to adapt to the risks posed by climate change. By transparently communicating their climate-related financial risks with the public, companies strengthen their relationships with investors and other stakeholders. Voluntary sustainability disclosures, when audited properly, enable companies to better foster trust with their stakeholders. These voluntary disclosures also provide companies the opportunity to develop novel organizational capabilities to improve their ESG performance and, in turn, enhance their corporate competitiveness.

There are several globally recognized frameworks that guide companies voluntarily disclose their climate-related risks and performance. This study will analyze five frameworks most often used by domestic O&G companies: the Task Force on Climate-related Financial Disclosures (TCFD), Global Reporting Initiative (GRI), Sustainability Accounting Standards Board (SASB), the International Petroleum Industry Environmental Conservation Association (IPIECA), and the United Nations Sustainable Development Goals (UN SDGs) operating under the UN Global Compact. Each of these frameworks provide a unique set of guidelines to help companies structure and standardize their reporting, communicating their climate-related data easier to their stakeholders and across industries. The following subsections will analyze the emergence, operations, and key strengths of each framework and delve into how these frameworks shape climate disclosure practices in the domestic O&G industry, providing a clearer understanding of their relevance and utility.

*Global Reporting Initiative (GRI)*

Established in response to Exxon Valdez oil spill, the Global Reporting Initiative (GRI) is one of the oldest voluntary climate disclosure frameworks. The Coalition for Environmentally Responsible Economies (CERES), the United Nations Environment Programme (UNEP), and the Tellus Institute created the GRI as an accountability mechanism to ensure companies' adherence to responsible environmental conduct principles. The GRI later expanded its jurisdiction to include broader social, economic, and governance issues. The first iteration of the GRI Guidelines, known as G1, was published in 2000, marking the emergence of the first global framework for sustainability reporting.

Given its broad structure and global applicability, the GRI has experienced wide-scale adoption across industries. The framework places stakeholder engagement and materiality assessments at the core of its reporting structure, enabling companies to comprehensively analyze their most crucial sustainability issues. GRI partners other global organizations, including the United Nations Global Compact, to better align its reporting framework with those of other nations. Doing so has enabled the GRI to gain significant ground in Europe and gradually in Asian markets like Japan and South Korea. GRI standards are free and publicly available, making it accessible for corporations of any size. However, larger entities and those with substantial resources often find compliance smoother due to their enhanced capacity for data gathering and reporting. In short, the GRI's collaborative structure positions it as one of the leading global climate disclosure frameworks.

The GRI Sector Standard for O&G (GRI 11), launched in January 2023, provides the O&G industry a robust framework for sustainability performance reporting. GRI 11 presents a list of 22 ESG-related disclosure topics, ranging from anti-corruption to biodiversity, that are

likely to be material for companies in the industry. This framework enables companies to disclose pertinent information on their policies, practices, and performances, aiding stakeholders in assessing an organization's sustainability performance. Further, GRI 11's alignment with other international sustainability standards, including the as UN SDGs and TCFD, ensures its reporting structure is consistent and comparable across geographies. GRI 11's guidelines provide specific strategy notes for better disclosure, thus becoming a crucial tool for domestic O&G entities to enhance their sustainability performance, transparency, and stakeholder trust.

*Task Force for Climate Related Financial Disclosures (TCFD)*

The Financial Stability Board (FSB) established the Task Force for Climate Related Financial Disclosures (TCFD) in 2015 to enhance climate financial disclosures in the financial sector to expand risk assessment and management capabilities. Critically, the TCFD emerged as a response to shortcomings identified in the 2015 Paris Agreement, which failed to establish an international standard of reporting carbon emissions. The TCFD brings together a diverse array of financial stakeholders to compel carbon-intensive industries, such as the energy and utilities, to be more transparent in their disclosure. Public-private partnerships have played a pivotal role in promoting and implementing TCFD recommendations, highlighting the synergistic potential of organizations, governments, and industry associations in improving climate disclosures.

Operating across four essential areas, governance, strategy, risk management, and metrics/targets, the TCFD framework aims to provide clear and consistent climate disclosures. Companies are encouraged to display their climate-related governance processes, embed climate considerations within their business strategies, and disclose how they identify, manage, and mitigate climate risks. Also, it nudges towards setting and disclosing climate-related targets and metrics. The TCFD's industry-led approach ensures that recommendations are shaped by

stakeholders who understand the specific challenges of different sectors. Its focus on financial disclosures and alignment with existing reporting frameworks such as the GRI and SASB, facilitates adoption within the financial community. The voluntary nature of TCFD could lead to uneven adoption and incomplete disclosures; nevertheless, the framework has made considerable strides in advancing climate-related financial disclosures globally.

The TCFD framework holds significant implications for the domestic O&G industry. Given the industry's inherent exposure to climate-related risks, the standardization and transparency offered by the TCFD recommendations are invaluable for managing these risks effectively. The framework's emphasis on governance and risk management aligns well with the strategic and operational needs of these companies. Furthermore, the TCFD's push for clear, consistent disclosures regarding climate-related targets and metrics promotes transparency and accountability, helping stakeholders make better-informed decisions. As increasing pressure from governments, consumers, and investors necessitates a more robust response to climate change, the role of the TCFD in shaping climate disclosure practices within this sector becomes ever more critical. The transition from using the TCFD's recommendations as guidance to embedding them into mandatory legislation and regulation is increasingly likely, marking a significant shift in the industry's approach to managing climate-related risks and disclosures.

*Sustainability Accounting Standards Board (SASB)*

The Sustainability Accounting Standards Board (SASB) is an ESG disclosure framework that formed in 2011. It was established to develop industry-specific standards for disclosing financially material sustainability information. The SASB framework operates through a market-led approach, involving market participants, investors, and industry experts. The SASB standards focus on financially material ESG topics that are specific to each industry, ensuring relevance

and comparability. Adoption of the SASB framework has gained momentum across industries, particularly in sectors where sustainability factors are critical to financial performance and risk management. The framework does not require public-private partnerships but actively seeks input from stakeholders during the standard-setting process.

The SASB framework tracks specific sustainability factors that are financially material within each industry. The SASB standards provide industry-specific guidelines for reporting on ESG topics, including governance, environmental performance, social capital, human capital, business model and innovation, and leadership and governance. These standards help companies identify and disclose the ESG factors most relevant to their industry and their business models. The SASB framework emphasizes the disclosure of financially material information that is useful for investors in making informed decisions. The framework's guidelines are structured to facilitate consistency, comparability, and decision-usefulness for stakeholders. The SASB's approach allows companies to focus on the ESG issues that are most impactful to their industry and can provide insights into their long-term value creation potential.

The SASB framework has notable strengths. Firstly, its industry-specific approach ensures that the standards are tailored to the unique sustainability challenges and opportunities faced by different sectors. This enhances the framework's relevance and usefulness to companies and investors. The SASB's focus on financially material ESG factors enhances the alignment between sustainability disclosures and financial performance, enabling investors to integrate ESG considerations into their decision-making process. However, one potential limitation is that the SASB's sector-specific focus may result in variations in the level of adoption and implementation across industries. Additionally, the SASB's standards may not cover the entire ESG landscape comprehensively, and companies may need to supplement their disclosures with

other frameworks or initiatives. Nonetheless, the SASB has made significant progress in advancing industry-specific ESG reporting and has gained recognition as a valuable tool for enhancing transparency and accountability in sustainable investing.

*United Nations Sustainable Development Goals (SDGs) and Global Compact*

The United Nations Sustainable Development Goals (SDGs) and the UN Global Compact are interconnected initiatives aimed at promoting sustainable development and responsible business practices. The SDGs, launched in 2015, consist of 17 goals that address global challenges such as poverty, inequality, climate change, and environmental degradation. The UN Global Compact is a voluntary initiative that encourages businesses to align their operations and strategies with ten principles encompassing human rights, labor, environment, and anti-corruption. The SDGs and Global Compact involve collaboration between the United Nations, governments, businesses, and civil society. While the SDGs are universally applicable, the Global Compact focuses specifically on companies committing to the ten principles. Adoption of the SDGs and Global Compact varies across industries, with sectors like energy, finance, and technology being actively involved due to their significant societal and environmental impact.

The SDGs provide a comprehensive framework for companies to track and report on their contributions to sustainable development. The goals cover a wide range of social, environmental, and economic issues, including poverty eradication, clean energy, gender equality, and responsible consumption. The SDGs serve as a guide for organizations to set targets, measure their progress, and report on their performance. The UN Global Compact, on the other hand, outlines ten principles that address human rights, labor standards, environmental stewardship, and anti-corruption efforts. Companies participating in the Global Compact are encouraged to make annual communications on their progress in implementing these principles.

The initiatives promote public-private partnerships and knowledge-sharing to drive collective action towards achieving sustainable development globally.

The SDGs and Global Compact have strengths in terms of their global reach, universal applicability, and strong alignment with the principles of sustainability. By leveraging the power of the private sector, these initiatives have mobilized companies to integrate sustainability into their operations. They promote responsible business practices, stakeholder engagement, and collaboration for sustainable development. However, a challenge lies in the voluntary nature of these initiatives, which may result in inconsistent adoption and limited accountability. The SDGs and Global Compact also face implementation challenges in certain regions, particularly in developing economies where capacity-building and resource constraints may hinder broader adoption. Nonetheless, these initiatives have provided a platform for businesses to contribute to global sustainability efforts, align with international norms, and demonstrate their commitment to responsible business conduct.

*International Petroleum Industry Environmental Conservation Association (IPIECA)*

The International Petroleum Industry Environmental Conservation Association (IPIECA) is a voluntary ESG disclosure framework specific to the O&G industry. It was founded in 1974 as a global industry association, representing O&G companies, and has since evolved to promote environmental and social responsibility within the industry. IPIECA operates through collaborative efforts involving its member companies, which include major multinational O&G corporations. The framework focuses on sustainability issues related to the O&G sector, such as climate change, biodiversity, water management, and social impacts. IPIECA's engagement often includes partnerships with other organizations, including governments, NGOs, and industry

stakeholders, to drive collective action and share best practices in environmental conservation and social responsibility.

IPIECA's framework tracks specific environmental and social performance factors relevant to the O&G industry. The framework provides guidelines and tools to support member companies in their sustainability efforts. It covers areas such as greenhouse gas emissions management, environmental impact assessments, biodiversity conservation, water stewardship, human rights, and community engagement. IPIECA's guidelines focus on industry-specific challenges and opportunities, providing a tailored approach to ESG reporting for O&G companies. The framework emphasizes continuous improvement, performance measurement, and collaboration to address environmental and social impacts throughout the industry value chain.

The IPIECA framework has strengths specific to the O&G industry. It serves as a platform for collaboration and knowledge sharing among industry participants, enabling the development and dissemination of industry-specific best practices and standards. The framework acknowledges the unique challenges faced by the sector and provides targeted guidance for sustainable practices. However, a potential weakness of the IPIECA framework is its voluntary nature, which may lead to varying levels of adoption and potential gaps in industry-wide sustainability efforts. Furthermore, the framework's industry-specific focus may limit its applicability to other sectors beyond O&G. Nonetheless, IPIECA has played a significant role in advancing environmental conservation and social responsibility within the O&G industry, contributing to ongoing efforts to mitigate the sector's environmental impacts and enhance its sustainability performance.

*Standardization Among Voluntary Climate Disclosure Frameworks*

When analyzing the strengths of various voluntary ESG disclosure frameworks, we can identify certain commonalities and group them accordingly. The TCFD and SASB frameworks share a focus on financial materiality and specific metrics, with the former emphasizing climate-related risks and opportunities and the latter concentrating on industry-specific sustainability factors. The GRI and UN SDGs/Global Compact frameworks stand out for their comprehensive approach, encompassing a broad range of environmental, social, and governance aspects. The GRI places emphasis on stakeholder engagement and materiality assessments, while the UN SDGs/Global Compact provide a universal framework aligned with global sustainability goals. Finally, the IPIECA and CDP frameworks cater specifically to the O&G industry, addressing industry-specific challenges and promoting collaboration within the sector. Together, these frameworks offer a collective ability to address the multifaceted landscape of voluntary ESG reporting, covering areas such as climate change, emissions, social impacts, and industry-specific considerations.

Standardization among voluntary ESG disclosure frameworks is crucial to overcome the challenges posed by fragmented reporting practices. A standardized approach would provide several benefits, including enhanced comparability and consistency in reporting, improved data quality, and simplified assessment and analysis for stakeholders. By establishing common reporting requirements and metrics, companies would face reduced reporting burden and increased efficiency. Moreover, standardization enables benchmarking and peer comparisons, fostering healthy competition and driving companies to improve their ESG performance. Standardized frameworks also facilitate better integration of ESG considerations into investment decision-making processes, allowing investors to make more informed assessments of companies' sustainability performance. Ultimately, by aligning reporting standards, voluntary

ESG frameworks can work in harmony to promote transparency, accountability, and the integration of sustainability across various industries and regions.

*Securities and Exchange Commission (SEC) Climate Disclosure Efforts*

The United States Securities and Exchange Commission (SEC) plays a pivotal role in ensuring transparency and standardization within financial markets. Established in 1934 as part of the Securities Exchange Act, its primary mandate is to protect investors and maintain fair, orderly, and efficient markets by enforcing federal securities laws. To fulfill this mandate, the SEC requires publicly traded companies to disclose accurate and timely financial information to their shareholders and the public, a process fostering transparency and mitigates investment risk.

Over the decades, the SEC has taken steps to standardize this financial reporting to promote comparability and consistency across companies. It has issued guidelines outlining the types of information that companies must disclose and the formats in which this information must be presented. This standardization aids in improving the clarity of financial disclosures, facilitating better decision-making by investors. The SEC's emphasis on financial disclosure and standardization is thus integral to maintaining the integrity of the securities market and upholding the interests of investors.

While financial reporting has been the cornerstone of the SEC's disclosure requirements, the agency has increasingly recognized the significance of other forms of disclosure, including those related to climate risks. This evolution in the SEC's perspective is a response to the evolving nature of investment risks and the increasing materiality of climate change to companies' financial performance. The growing emphasis on climate disclosure underscores the SEC's commitment to ensuring that investors have access to all relevant information, financial and non-financial alike, to make informed investment decisions.

In 2010, the SEC issued interpretive guidance on existing disclosure rules related to climate change. This guidance was a landmark move, highlighting the SEC's recognition of climate risks as a potential material risk for companies. It provided companies with direction on how to consider climate change and its associated risks when preparing disclosures required by federal securities laws. This guidance did not impose new legal requirements but rather aimed to clarify how existing rules apply to climate change matters.

However, the 2010 guidance was widely viewed as insufficient, given the escalating urgency of climate change and the lack of clarity and consistency in companies' climate disclosures. Moreover, the guidance was not strictly enforced, leading to widespread variation in the quality and comprehensiveness of climate disclosures. Recognizing these limitations, the SEC has taken steps to further refine its approach to climate disclosure.

In 2021, the SEC announced that it would review the 2010 guidance and consider updates to improve the consistency and comparability of climate disclosures. This announcement reflected the SEC's commitment to enhance its climate disclosure requirements in response to evolving investment risks and investor demands for greater transparency.

In response to these challenges and changing investor demands, the SEC is developing a new proposal on climate disclosure. This proposal aims to standardize climate disclosure requirements, enhance the quality of climate disclosures, and make them more useful to investors. It is expected to address the disclosure of greenhouse gas emissions, climate risks, and companies' strategies for managing these risks.

The new SEC proposal represents a significant step forward in the regulation of climate disclosure. By establishing legally enforceable standards, the proposal could enhance the consistency and comparability of climate disclosures, fulfilling the SEC's mandate of protecting

investors and maintaining efficient markets. The shift towards standardized climate disclosure signals the SEC's recognition of the materiality of climate risks and the critical role of disclosure in managing these risks, marking a new chapter in the agency's approach to disclosure regulation.

## Analysis

*TCFD Pillars One and Two: Governance and Risk Management*

Seven of the nine O&G companies have shown their commitment to managing climate change by establishing a board committee on climate change, an alignment with the first TCFD governance recommendation. For example, Chevron and Energy Transfer LP have each set up a board committee responsible for overseeing their respective climate change strategies and reporting, highlighting the significance they place on managing climate-related issues.

Transparency in business practices is another key facet of TCFD's governance recommendations. Here, eight out of the nine companies disclose climate-related risks and opportunities in their annual sustainability reports, thus allowing investors and stakeholders to understand their exposure to these risks. Specifically, ConocoPhillips and Enterprise Products Partners LP disclose such risks and opportunities, demonstrating a positive step towards integrating the second TCFD governance recommendation.

A proactive approach to climate change is visible in the actions of seven out of these nine companies that have set targets for reducing greenhouse gas emissions. This trend resonates with the third TCFD governance recommendation, emphasizing these companies' commitment to mitigation of their climate impacts. ExxonMobil and Phillips 66, for example, aim for a 20% reduction in greenhouse gas emissions by 2030, showcasing their serious dedication towards climate change mitigation.

Furthermore, seven out of the nine companies have integrated climate change into their risk management frameworks, which is a crucial step in ensuring that climate-related risks are identified, assessed, and managed on par with other risks. This move reflects the fourth TCFD governance recommendation. For instance, Marathon Petroleum Corporation and ConocoPhillips

have integrated climate change into their risk management framework, signifying the importance they attribute to the potential risks posed by climate change.

*TCFD Pillar Three: Strategy*

All nine O&G companies explicitly describe their strategy for managing climate-related risks in their annual sustainability reports. This step shows a clear effort to enhance transparency and accountability. Chevron, for instance, established a board committee on climate change responsible for strategy oversight and reporting, chaired by an independent director. ExxonMobil and Enterprise Products Partners LP go further by setting tangible targets for reducing greenhouse gas emissions and making investments in low-carbon technologies like carbon capture and storage.

Eight of the nine companies explain how their strategy aligns with the goals of the Paris Agreement. By setting ambitious targets for reducing greenhouse gas emissions and investing in low-carbon technologies, these companies demonstrate a commitment to the global effort against climate change. Kinder Morgan Inc and Valero Energy Corporation exhibit a proactive engagement approach with stakeholders, which includes investors, customers, employees, and governments, to better understand their concerns and develop solutions addressing climate change.

Seven of the nine companies disclose the resilience of their strategy under different climate-related scenarios. This disclosure suggests a higher degree of preparedness for climate change impacts on business operations. Companies like ConocoPhillips and Phillips 66 provide climate-related information in their annual sustainability reports, including greenhouse gas emissions, exposure to climate-related risks, and plans for managing climate change. Marathon

Petroleum Corporation, too, has established a board committee on climate change, which oversees their climate change strategy and reporting.

*TCFD Pillar Four: Metrics and Targets*

Disclosing metrics for assessing climate-related risks and opportunities proves integral to an organization's strategy and risk management process. Seven out of the nine analyzed O&G companies reveal such metrics. These metrics span from greenhouse gas emissions, financial impacts due to climate change, to climate-related risks challenging the company's operations. This disclosure enables investors and stakeholders to gain insight into the risks and opportunities the companies face due to climate change, and the strategies employed for managing them.

The transparency regarding Scope 1, Scope 2, and, where appropriate, Scope 3 greenhouse gas (GHG) emissions, along with their related risks, is another noteworthy metric. Eight of the nine companies disclose their Scope 1 and Scope 2 emissions, with six also including Scope 3 emissions. For example, Chevron discloses all three scopes of GHG emissions and has committed to reducing its emissions by 28% by 2030, compared to 2016 levels. Similarly, ExxonMobil, though reporting only Scope 1 and 2 emissions, has set an emissions reduction target of 15% by 2025.

The third key consideration involves the targets set by organizations to manage climate-related risks and opportunities. Seven of the nine O&G companies disclose such targets, which range from reducing greenhouse gas emissions to increasing renewable energy production, and investing in low-carbon technologies. For example, Phillips 66 and Marathon Petroleum Corporation aim to reduce their GHG emissions by 20% and 18% respectively by 2030, while also committing to the elimination of methane emissions by 2025.

**Discussion**

Earlier this month, the U.S. Securities and Exchange Commission (SEC) introduced proposed climate disclosure requirements for companies to be implemented in 2022. These rules will mandate both qualitative and quantitative climate disclosures in annual reports (Form 10-Ks) and other public filings. While the SEC's efforts are seen as a positive step, progress in implementation has been delayed due to the varying opinions within the financial sector regarding the scope of climate disclosures. This said, the initial implementation of this proposal is expected to focus on large companies, with separate rules and extended timelines for compliance for smaller firms, similar to the European Union's approach.

The complexity of measuring and assigning responsibility for indirect emissions, along with the lack of consensus, may lead the SEC to mandate disclosure primarily for Scope 1 and possibly Scope 2 emissions. It is also unlikely that the SEC will go beyond the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD) regarding the disclosure of strategies and management plans for addressing climate risks. Furthermore, any SEC ruling is anticipated to have a delayed effective date, allowing corporations time to adapt.

The SEC's proposal for standardized climate disclosure has sparked divergent views concerning the agency's legal authority. A faction, inclusive of some ex-SEC Commissioners, contends that the mandate oversteps the SEC's legal remit and delves into the domain of climate policy regulation. They argue that this action could set a dangerous precedent, blurring the lines between regulatory and policy domains. On the flip side, a different set of former SEC Commissioners, among others, uphold the agency's jurisdiction, perceiving the proposal as an evolution of the SEC's preceding environmental disclosure mandates. They assert that the SEC is

simply evolving to meet the current environmental, social, and governance (ESG) reporting demands of market participants.

The requirement for companies to disclose Scope 3 emissions – those originating from supply chains and product use – has also stirred contention. A section of stakeholders champions a broader disclosure of Scope 3 emissions, pushing for its expansion to smaller entities. They argue that a comprehensive view of a company's carbon footprint, including indirect emissions, provides a fuller picture of climate-related risks. However, a counterpoint exists where some stakeholders advocate for a more restrained requirement, suggesting that Scope 3 disclosures should remain optional or be postponed until potential data complications are addressed. They contend that the complexity and potential inaccuracies involved in quantifying Scope 3 emissions could lead to misleading data, distorting the understanding of a company's true environmental impact.

The question of materiality, particularly in relation to the proposed 1% threshold for financial statement disclosures, is a source of extensive discourse. Critics argue that this threshold could lead to the dissemination of immaterial or inconsistent data, creating noise that confuses rather than informs investors. Furthermore, some suggest that this standard contradicts established notions of materiality, calling for a return to principles that focus on materiality rather than hard thresholds. For instance, Marathon Oil Corporation, one of the nine O&G companies investigated in this study, submitted a public comment to the SEC mentioning that "while information regarding climate and sustainability efforts is valuable to many stakeholders, this does not make it material in the securities context" (White, 2022). Five of the eight other O&G companies also submitted public comments to the SEC, stating a similar theme that certain

climate disclosures, while important to investors, are not material and therefore shouldn’t be required for reporting.

Beyond SEC regulations, other measures are indirectly influencing the standardization of ESG disclosure. Recent national and international efforts to reduce methane emissions are signaling the need for improved disclosures in this area. Various initiatives, ranging from nonbinding political commitments like the Global Methane Pledge to regulatory enforcement measures such as proposed EPA standards, emphasize the importance of disclosing methane emissions and reduction targets. These actions serve as a clear message to industry and investors, highlighting the growing significance of methane disclosures. The SEC's proposed climate disclosure requirements are a significant development in the sphere of ESG, though implementation is expected to proceed cautiously. The focus may initially be on larger companies, primarily requiring the disclosure of Scope 1 and Scope 2 emissions.

The O&G industry has responded to the SEC's tentative climate disclosure regulations with a mix of reactions. Some companies have expressed support for the regulations, citing potential benefits in terms of transparency and accountability. According to a survey conducted by the American Petroleum Institute (API), 58% of O&G executives surveyed expressed their support for the SEC's proposed regulations, while 39% opposed them; furthermore, 69% of respondents believed that the regulations would have a positive impact on the industry (Ernst & Young, n.d.). The American Exploration and Production Council (AEPC), representing independent O&G producers, has also welcomed the SEC's proposed regulations. The AEPC views the regulations as an opportunity to level the playing field for independent producers, who often face disadvantages compared to larger integrated oil companies. They see the regulations as a step towards ensuring fair competition within the industry.

However, the Western Energy Alliance (WEA), representing O&G producers in the Rocky Mountain region, has expressed criticism of the SEC's proposed regulations. The WEA argues that the regulations are overly burdensome and will impose an undue financial burden on independent producers. They have urged the SEC to withdraw the proposed regulations and collaborate with the industry to develop a more tailored approach to climate disclosure. As the SEC finalizes the regulations in the coming months, it is anticipated that the O&G industry will continue to debate the merits of the regulations. The divergent opinions within the industry reflect the complex challenges and varying perspectives on climate disclosure. The final regulations will undoubtedly have a significant impact on the industry, shaping the future of climate-related reporting practices.

**Conclusion**

The existing lack of standardization in ESG reporting, particularly concerning GHG emissions and climate-related risk management, presents significant challenges in evaluating and comparing sustainability performances among major players in the O&G industry. Investors' tolerance for ambiguous and inconsistent ESG metrics appears to be diminishing. The current voluntary and unstandardized nature of these disclosures complicates investors' ability to distinguish industry leaders, impairing effective capital allocation decisions. This inconsistency also obstructs companies from enjoying competitive advantages, such as favorable capital access conditions, associated with superior sustainability performance. Although better disclosure regulations are on the horizon, they may not be operational for another three to four years.

The acceptance window for investors and lenders to deal with O&G companies that fail to align with their own net-zero targets is narrowing. While the demand for O&G products remains strong despite escalating climate change concerns, the solution to this dilemma cannot be exclusively supply-driven. This study identifies fundamental principles for ESG performance reporting in the U.S. O&G sector by conducting detailed surveys on companies' annual sustainability reports. In turn, this study provide a foundation for both companies and investors to enhance the quality and comparability of ESG reporting across the industry.

The advent of the EU taxonomy rules and potential SEC disclosures might promote more rigorous reporting standards, enabling sector-wide comparisons. However, the study underscores the urgency for companies to act now to narrow the gap between the industry's voluntary disclosures and the data required by financial institutions for appropriate risk assessments. Additionally, the emergence of advanced emissions-measurement technologies, such as satellite

surveillance data, will subject the industry to intensified scrutiny, particularly if measured emissions significantly exceed self-reported figures.

There are several opportunities for future research as the SEC continues to implement its plan to standardize climate disclosures. Future research should explore if standardized disclosures enhance transparency, risk assessment, and investor decision-making within the U.S. O&G industry while examining the potential impacts on industry practices and climate-related risk management. In tandem, this research should evaluate how these regulatory changes can drive improvements in sustainability performance and the O&G industry's response to climate change. Understanding the potential implications and opportunities of upcoming regulatory changes would provide invaluable insights to stakeholders and policymakers, contributing to the broader discourse on sustainable development for the domestic O&G industry.

# Appendix

Figure 1: Comparison of ESG Information Published by Select O&G Companies

| | Chevron | ExxonMobil | ConocoPhillips | Kinder Morgan Inc | Energy Transfer LP | Enterprise Products Partners LP | Phillips 66 | Valero Energy Corporation | Marathon Petroleum Corporation |
|---|---|---|---|---|---|---|---|---|---|
| **ESG Frameworks Referenced** | | | | | | | | | |
| Sustainability Accounting Standards Board (SASB) | X | X | X | X | X | X | X | X | X |
| Task Force on Climate-Related Financial Disclosures (TCFD) | X | X | X | X | | | X | X | X |
| International Petroleum Industry Environmental Conservation Association (IPIECA) | X | | X | | | | X | | X |
| Global Reporting Initiative (GRI) | X | | X | X | X | X | X | | X |
| UN Sustainable Development Goals (UN SDG) | X | | X | X | X | X | | | |
| UN Global Compact | | | X | X | | | | | |
| **Emissions reductions targets** | | | | | | | | | |
| Baseline year | 2016 | 2016 | 2019 | 2016 | 2016 | 2016 | 2016 | 2016 | 2016 |
| Goal Year | 2028 | 2028 | 2025, 2030 | 2028 | 2028 | 2028 | 2030 | 2028 | 2028 |
| GHG emissions target | Reduce GHG emission intensity by 5% (Scope 1, 2, and 3) | Reduce GHG emission intensity by 15% | Reduce GHG emission intensity by 15% (Scope 1 and 2) | Reduce GHG emission intensity by 20% (Scope 1 and 2) | Reduce GHG emission intensity by 30% (Scope 1 and 2) | Reduce GHG emission intensity by 20% (Scope 1 and 2) | Reduce GHG emission intensity by 30% (Scope 1 and 2) | Reduce GHG emission intensity by 20% (Scope 1 and 2) | Reduce GHG emission intensity by 20% (Scope 1 and 2) |
| Methane emissions target | Reduce methane emission intensity by 57% | Reduce methane emission intensity by 60% | Reduce methane emission intensity by 75% | Reduce methane emission intensity by 45% | Reduce methane emission intensity by 45% | Reduce methane emission intensity by 45% | Reduce methane emission intensity by 45% | Reduce methane emission intensity by 45% | Reduce methane emission intensity by 45% |
| Flaring elimination targets | Zero routine flaring by 2030 | Zero routine flaring by 2025 | Zero routine flaring by 2025 | N/A | N/A | N/A | N/A | Reduce routine flaring by 50% by 2025 | N/A |

| Net-zero Target Year | 2050 | 2050 | 2050 | 2040 | 2050 | 2050 | 2050 | 2050 | 2050 |
|---|---|---|---|---|---|---|---|---|---|
| Reported emissions (Scope 1, 2, or 3) | 1, 2 | 1, 2 | 1, 2 | 1, 2 | 1, 2 | 1, 2 | 1, 2 | 1, 2 | 1, 2 |
| Third-party verification of reported GHG emissions | Climate Disclosure Standards Board (CDSB) | CDP | CDP | CDP | CDP | CDP | CDP | CDP | CDP |
| Scenario analysis referenced | X | X | X | X | X | X | X | X | X |
| **Capital Expenditures on GHG Reduction Measures (2021)** | | | | | | | | | |
| Expenditures (USD) | $1.5B | $1.2B | $1.0B | $0.8B | $0.7B | $0.6B | $0.5B | $0.4B | $0.3B |
| Expenditures (% of total expenditures) | 1.4% | 1.2% | 1.1% | 1.0% | 0.9% | 0.8% | 0.7% | 0.6% | 0.5% |
| Source | 2022 | 2022 | 2022 | 2022 | 2022 | 2022 | 2021 | 2022 | 2022 |

# Bibliography

Chevron. (2022). “Chevron Sustainability Report.” Accessed May 7, 2023. https://www.chevron.com/-/media/shared-media/documents/chevron-sustainability-report-2022.pdf.

ConocoPhillips. (2021). “ConocoPhillips Sustainability Report.” Accessed May 7, 2023. https://static.conocophillips.com/files/resources/conocophillips-2021-sustainability-report.pdf.

Exxon Mobil Corporation. (2021). “Exxon Mobil Sustainability Report.” Accessed May 7, 2023. https://corporate.exxonmobil.com/-/media/global/files/sustainability-report/publication/exxonmobil-sustainability-report.pdf.

Energy Transfer. (2021). “ET 2021 Corporate Responsibility Report.” Accessed May 7, 2023. https://energytransfer.com/wp-content/uploads/2022/12/ET-2021-CRR-V13.pdf.

Enterprise Products. (2022). “Enterprise Products Sustainability Report.” Accessed May 7, 2023. https://www.enterpriseproducts.com/Enterprise-Products-2021-2022-sustainability-report.pdf.

Ernst & Young LLP. (n.d.). How do we regenerate this generation's view of oil and gas? [PDF]. Retrieved from https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/oil-and-gas/ey-how-do-we-regenerate-this-generations-view-of-oil-and-gas.pdf

Kinder Morgan. (2021). “Kinder Morgan ESG Report.” Accessed May 7, 2023. https://www.kindermorgan.com/WWWKM/media/Safety-Environmental/documents/2021_ESG_Report.pdf

Marathon Petroleum Corporation. (2021). “Marathon Petroleum Sustainability Report.” Accessed May 7, 2023. https://www.marathonpetroleum.com/content/documents/Responsibility/DOWNLOAD%20MPC_MPLX%202021%20Sustainability%20Report.pdf.

Phillips 66. (2022). “Phillips 66 Sustainability Report.” Accessed May 7, 2023. https://issuu.com/phillips66co/docs/2022sustainabilityreport?fr=sYTYwYzUxMzk1MDc

Valero Energy Corporation. (2022). “Valero ESG Report.” Accessed May 7, 2023. https://www.valero.com/sites/default/files/valero-documents/ESG_Report%20_August_2022_FINAL_SinglePages.pdf.

White, Rob. (2022). Comments of Marathon Oil Corporation on the Proposed Rule "The Enhancement and Standardization of Climate-Related Disclosures for Investors," SEC File No. S7-10-22. [PDF]. Retrieved from https://www.sec.gov/comments/s7-10-22/s71022-20131814-302251.pdf

Wong, H. X, Zimmerman, N., Blanton, E., Boersma, T., (2022). Upstream ESG: A practical guide to integrating environmental, social, and governance factors into oil and gas upstream operations [PDF]. Columbia University Center on Global Energy Policy. Retrieved from https://www.energypolicy.columbia.edu/wp-content/uploads/2022/04/Upstream_ESG_Final-1.pdf